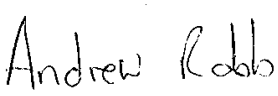
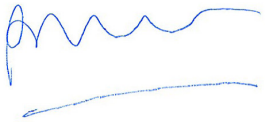
NORTH EAST SCOTLAND FREIGHT FORUM

Aberdeen City Freight Flows - Survey Report

nestrans Aberdeenshire COUNCIL ABERDEEN CITY COUNCIL

StratMoS The Interreg IVB North Sea Region Programme





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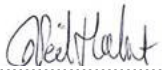

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Capabilities on project:
Transportation

Executive Summary

Introduction

Within their 2008 Regional Transport Strategy, Nestrans committed to the development of a Freight Action Plan. This Action Plan was launched in 2009, and sets out how Nestrans and its partners can assist in the delivery of more effective and efficient freight operations, for the wider benefit of the North East of Scotland.

One of the identified actions in the freight action plan was for Nestrans, together with Aberdeen City Council and Aberdeenshire Council, to confirm key freight flows in the North East of Scotland, as follows:

"A network wide survey of freight traffic to confirm the key roads in the north east used for transporting freight, and types of freight movement.

This should include specialised goods vehicle counts which aim to add value to a typical traffic count, with observers expert in differentiating different types of lorries, country of origin, whether laden/unladen etc. The work would build upon desktop work aimed at understanding regional freight flows and activity, and analysis of existing monitoring information."

AECOM was commissioned to undertake a programme of on-site specialised freight surveys in September 2010 to confirm the characteristics of freight flows on the principal freight routes in the North East of Scotland. This commission builds on previous work undertaken by AECOM, on behalf of Aberdeenshire Council, which investigated the quantification and monitoring of core freight flows across Aberdeenshire and the wider North East of Scotland.

This work is supported by StratMoS – the European Interreg IVB project, looking at strategic freight movements across the North Sea region. Demonstration project 3a of StratMoS looks at the development of a future regional freight hub and the information received from these surveys will be used to further inform the development and feasibility of a multi-modal freight hub for the North East of Scotland.

Methodology

Freight Surveys have been undertaken at key locations on the area's strategic road network to collect information about freight flows. The surveys consisted of 16 hour high mast video surveys, and shorter duration roadside observation surveys using hand-held video cameras. These were undertaken at Market Street, Wellington Road, and Riverside Drive (for Anderson Drive route). The work has provided baseline information on freight flows, operator details, load types, and vehicle/unit types. The work will be used to inform the development of other freight projects contained in Nestrans' Freight Action Plan, and other related schemes including consideration of a Low Emissions Zone for Aberdeen City Centre.

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Key Finding 1 – Distinctive Patterns of Activity

The High Mast surveys revealed distinctive patterns of activity of Goods Vehicle Movements at each of the three sites.

All South to North movements (i.e. vehicles entering the city from the South) tended to peak between 10am and 12 noon, prior to steadily decreasing during the rest of the day.

Conversely, North to South movements (i.e. vehicles leaving the city towards the South) had two peaks – firstly one between 9am and 11am, and a second peak between 2pm and 4pm.

Overall, South to North movements were higher between 0600 and 0700 than the North to South movements, and maintained a lower, but more consistent level of activity throughout the day. By contrast, North to South movements typically appeared more compressed, and more peaky, particularly in the middle of the day. The peakiness of the North to South movements may be explained by the fact that these trips are generally being captured close to their journey origin, whilst the South to North movements may be captured further from their journey origin (and from a wider variety of origins) potentially smoothing out the impacts of lunch breaks, and shift start/finish times.

Key Finding 2 – Different Levels of Activity by Location

The surveys confirm that the busiest location for freight vehicles (from the three points surveyed) was the Market Street/Virginia Street area. This is due to the presence of the harbour generating many local delivery and pick-up trips, and the use of the route as a preferred through route for goods vehicles. At this location, there was also an apparent preference of direction for North to South movements.

Patterns of activity at Wellington Road closely matched those found at Market Street, although levels of activity were lower. Some of the local movements associated with the harbour would have dispersed into the local network prior to reaching this point in the network.

The levels of activity at Holburn Street/Riverside Drive were the lowest observed in the survey, supporting anecdotal evidence that this route is less preferred. The South to North direction (Southbound on Riverside Drive) was more popular for the largest goods vehicles, perhaps indicating a preference for use in this direction. This may be due to the two left turns required on the Riverside Drive / Holburn Street diversion, but also due to other factors on the route (such as the steep hill on the northbound approach to Haudagain Roundabout).

Key Finding 3 – Freight Efficiency

The results of the ground level surveys demonstrated the correlation between the directions of travel and whether a freight vehicle was laden or unladen (where this was able to be assessed). A greater percentage of freight vehicles travelling towards Aberdeen were found to be laden, while the number of empty vehicles was higher for southbound traffic travelling away from Aberdeen.

There may be an opportunity to increase freight efficiency on some of these returning unladen vehicles (for example by encouraging back loading), although the extent to which this would be possible is difficult to determine as some of these vehicles may have had further collection points, thus necessitating the towing of an empty trailer.

Key Finding 4 – Mix of Different Traffic Types

The observations point to a mix of different traffic types at the different locations. Market Street/Virginia Street had the highest proportion of local freight operators (78%), due to local hauliers serving the harbour. This is supported by this site also registering the highest proportion of Flat Bed articulated

lorries, typically used for general offshore related haulage, at 25% (this was 15%-16% at the two other locations).

At Wellington Road, the proportion of local traffic was 66%-74%, whist at Riverside Drive it was much lower at 60%-62%.

Key Finding 5 – Engine Standard

Analysis of registration plates demonstrate that there are very few Euro 0, Euro I or Euro II vehicles using the local network in Aberdeen, typically around 10% of the total. There is a much larger proportion of Euro III lorries in the fleet, at around 40%.

The boundary between the Euro III and Euro IV engined lorries appears to mark a “tipping point” in the fleet, as slightly greater than 40% of the lorries are Euro IV, with the remainder being Euro V. This pattern is broadly consistent across the three locations surveyed.

Summary

The work that has been undertaken provides a resource for further analysis and interrogation, which can be tailored to suit the requirements of the particular projects. Ground level photos and video footage is retained to facilitate this, with data held within a spreadsheet format.

Consideration may be given to undertaking similar surveys at other strategic locations on the region’s freight network, such as the A90(N) and the A96, along with city centre surveys at Auchmill Road / Powis Terrace and on King Street.

Introduction

1 Introduction

1.1 Introduction

Within their 2008 Regional Transport Strategy, Nestrans committed to the development of a Freight Action Plan. This Action Plan was launched in 2009, and sets out how Nestrans and its partners can assist in the delivery of more effective and efficient freight operations, for the wider benefit of the North East of Scotland.

One of the identified actions in freight action plan was for Nestrans, together with Aberdeen City Council and Aberdeenshire Council, to confirm key freight flows in the North East of Scotland, as follows:

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AECOM was commissioned to undertake a programme of on-site specialised freight surveys in September 2010 to confirm the characteristics of freight flows on the principal freight routes in the North East of Scotland. This commission builds on previous work undertaken by AECOM, on behalf of Aberdeenshire Council, which investigated the quantification and monitoring of core freight flows across Aberdeenshire and the wider north east of Scotland.

This work is supported by StratMoS – the European Interreg IVB project, looking at strategic freight movements across the North Sea region. Demonstration project 3a of StratMoS looks at the development of a future regional freight hub and the information received from these surveys will be used to further inform the development and feasibility of a multi-modal freight hub for the North East of Scotland.

1.2 Freight in the North East of Scotland

Road haulage is the dominant means by which freight is transported in the North East of Scotland, recognised in the Freight Action Plan, which states:

"Considering the average freight lifted between 2003 and 2007…16,723 thousand Tonnes of goods were transported wholly within the Grampian area (79%)…Given that 79% of goods are transported wholly within Grampian, there are few viable alternatives other than to transport this freight by road."

The principal freight route in the Nestrans area is the A90 (south) linking Aberdeen to Dundee and Central belt. The A90 (north) linking Aberdeen to Peterhead and Fraserburgh, and the A96 linking Aberdeen to Inverness are also strategically important. Within Aberdeen City there are two principal freight routes through the city – the A90 via Anderson Drive which for freight vehicles involves a diversion via Riverside Drive/Holburn Street, and the city centre route via A956 Wellington Road, Market Street, Virginia Street, Commerce Street and King Street.

The surveys included in this report focus on Market Street within Aberdeen City Centre, the A956 at Wellington Road, and Holburn Street which is a diversionary route for all vehicles wider than 7 ft / 2.1m using A90 Anderson Drive.

1.3 Structure of Report

The remainder of this report is structured as follows:

- Chapter 2 – Survey Methodology;
- Chapter 3 – High Mast Video Survey Results;
- Chapter 4 – Ground Level Video Survey Results; and
- Chapter 5 – Key Findings and Conclusions.

Appendix A confirms the classification used for the high mast surveys.

Appendix B confirms the location of the surveys.

Survey Methodology

2 Survey Methodology

2.1 Introduction

This chapter sets out the methodology employed for the freight flow surveys. It considers:

- Data Collection Methodology; and
- Survey Sites Selection.

2.2 Data Collection Methodology

The surveys were designed to record the number of Heavy Goods Vehicles (HGVs), classify different types of HGV, and acquire more specific information on the characteristics of individual vehicles. Two complementary methods were used for collecting the information were as follows:

- High Mast Video Surveys; and
- Ground Level Video Surveys.

2.2.1 High Mast Video Surveys

High mast video surveys were undertaken to assist in providing a standardised count of the different types of vehicle accessing survey areas over a period of 16 hours, from 0600-2200. This approach enabled HGV types to be counted and classified as per the Design Manual for Roads and Bridges, Section 7, Part 2, Traffic Assessment (extract provided in Appendix A).

- OGV1, Other Goods Vehicles: Rigid lorries with 2 or 3 axles;
- OGV2, Other Goods Vehicles (Rigid): Rigid lorries with 4 axles; and
- OGV2, Other Goods Vehicles (Articulated): Articulated lorries with 3, 4 or more axles.

For the purposes of analysis, these categories were labelled **OGV1**, **OGV2(R), OGV2(A).**

As well as counting and classification of different HGV types, the high mast video surveys were also considered valuable because they facilitated comparisons between the level of HGV traffic and the overall traffic flow on the same route. They also enabled the identification of peak periods of vehicle flow.

2.2.2 Ground Level Video Surveys

Through work on the Low Emission Zone (LEZ) feasibility study for Aberdeen City Council, AECOM identified the potential for supplementing an already commissioned high mast video survey for the Market Street/Virginia Street area by capturing more detailed survey data on-site at this location.

The feasibility of obtaining supplementary data was assessed by using a hand-held camcorder (at ground level) to record freight vehicles in the area. It was found that lorry types, loads, markings and operator details could be easily recorded by recording the flow from a side angle, zooming in to identify vehicle characteristics and later pausing the footage to note these details.

This method adds value to standardised traffic count data provided by high mast video surveys, and was used to provide more detailed information on a sample of the traffic being captured by the high mast surveys.

As the trial of this methodology proved successful, this had the benefit of not only confirming the adoption of this approach for this study; it generated meaningful results which have subsequently been incorporated into the findings of this study.

Table 2.1 summarises the attributes of the two video survey methods.

Table 2.1 – Survey Method Advantages

High Mast Video	Ground Level Video
Total HGV Count	Supplements High Mast Data, by providing more detailed "sample" of the traffic flow.
Classification of HGV Types and traffic flow over a 16 hour period.	Close Capture of Individual Registration Plates, vehicle type, load type (where visible) and Cab/Trailer Markings

The next section details the sites selected to undertake freight surveys using the above methods.

2.3 Survey Site Selection

Following the confirmation of the data collection methods, the survey sites were identified. Through discussion with the Client, these were selected to capture information on the key strategic routes to and from Aberdeen from the south, as well as a key link in the local freight network.

- Market Street – adjacent to the harbour, which has a very high concentration of freight vehicles;
- Riverside Drive (near Holburn Street) – captures all HGV flows using A90 Anderson Drive; and
- Souterhead Roundabout (Wellington Road) – captures all HGV flows using the A956 route.

Each of these locations are described below.

2.3.1 Site 1 – Market Street

Market Street is at the heart of Aberdeen and is a key route for HGV traffic travelling between locations north and south of Aberdeen, and accessing Aberdeen Harbour.

The Market Street freight surveys were undertaken in June 2010. As noted earlier, this work supplemented part of the Low Emission Zone (LEZ) feasibility study for Aberdeen City Council, part of which is seeking to understand HGV flows in the Market Street/Virginia Street area of Aberdeen City Centre.

This provided the opportunity to trial the methodology for the supplementary ground level survey technique. As the ground level method was being trialled, only city (north) bound traffic was recorded at ground level as part of this survey, but the information collected forms an important part of the results for this study.

Classified high mast survey data for all junctions/directions in the Market Street/Virginia Street area were also recorded as part of this work.

2.3.2 Site 2 – Riverside Drive (near Holburn Street)

Following the freight surveys on Market Street, two further locations were selected to capture flows to and from the A90 Trunk Road in September 2010.

The first of these locations was near Riverside Drive at the Holburn Street/Riverside Drive Junction, in order to capture flows using A90 Anderson Drive. This route is used by HGVs as the main diversion route to/from the A90 (North) and A90 (South) as these vehicles cannot cross the A90 at the Bridge of Dee due to a 7 ft / 2.1m width restriction.

Northbound and southbound high mast and ground level video surveys were undertaken at this site.

2.3.3 Site 3 – Souterhead Roundabout (Wellington Road)

The third site selected for the freight surveys was the Souterhead Roundabout on Wellington Road (A956). This route is used by HGVs as the primary route to/from Aberdeen Harbour via the A90 (South), and forms part of the heavily used "through city" HGV route.

Wellington Road also provides access to Wellington, Altens and Tullos Industrial Estates and the Altens Lorry Park facility.

Northbound and southbound high mast and ground level video surveys were also undertaken at this site.

2.3.4 Site Scoping

Site scoping visits were undertaken at each of the selected survey locations to confirm their suitability to capture the required information using the above methods and to confirm the most appropriate locations for ground level surveyors to be positioned. Appendix B identifies the survey locations.

Surveyor positions were chosen on the basis of ensuring it was possible to safely record the traffic flow from a side angle to enable identification of vehicle characteristics.

2.4 Summary

The survey approach identified provided an effective and efficient way to collect detailed information about freight flows on key routes within Aberdeen. Table 2.2 below summarises the sites identified for the freight surveys and provides details of the methods adopted to collect information at these locations.

Table 2.2 – Summary of Survey Sites

Survey Site	Survey Date	Data Collection Methodology
Market Street	24 June 2010	High Mast Video (Market St/Virginia St/Guild St) Ground Level Video (Northbound only)
Riverside Drive	22 September 2010	High Mast Video (Northbound and Southbound) Ground Level Video (Northbound and Southbound)
Souterhead Roundabout (Wellington Road)	23 September 2010	High Mast Video (Northbound and Southbound) Ground Level Video (Northbound and Southbound)

The next two chapters set out the results of the high mast and ground level video surveys respectively.

High Mast Video Survey Results

3 High Mast Video Survey Results

3.1 Introduction

This chapter sets out the results of the high mast video surveys undertaken at the three survey locations as follows:

- Market Street/Virginia Street ;
- Riverside Drive (near Holburn Street) ; and
- Souterhead Roundabout (Wellington Road).

For each site, analysis of the data has been undertaken by survey location (and direction), and according to the following categories:

- Total Other Goods Vehicles (OGVs);
- Breakdown of OGV types; and
- Relationship between OGVs and Total Traffic Flows.

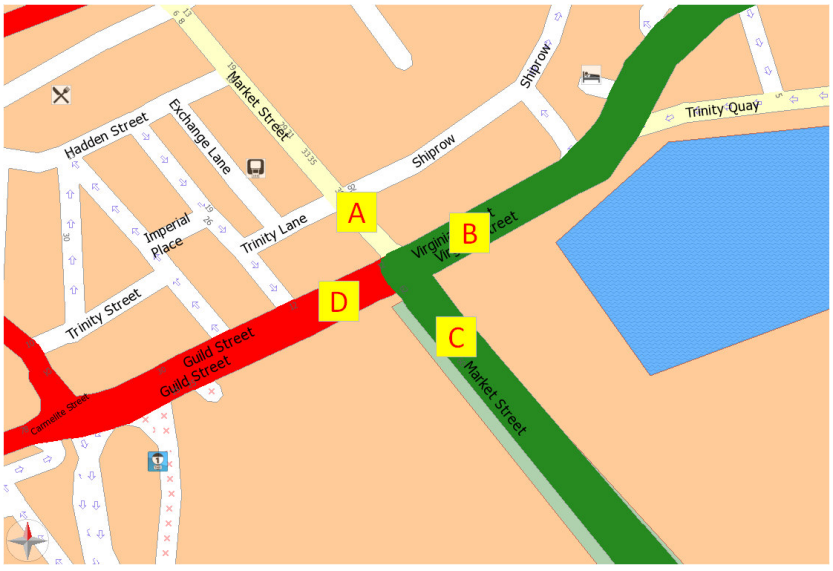
All information was recorded in a spreadsheet to facilitate analysis.

3.2 Market Street/Virginia Street

The survey was undertaken on Thursday 24 June 2010.

The high mast video survey covered the Market Street/Virginia Street junction, and counted and classified vehicles originating from/travelling to the following:

Figure 3.1 – Market Street/Virginia Street Site Plan



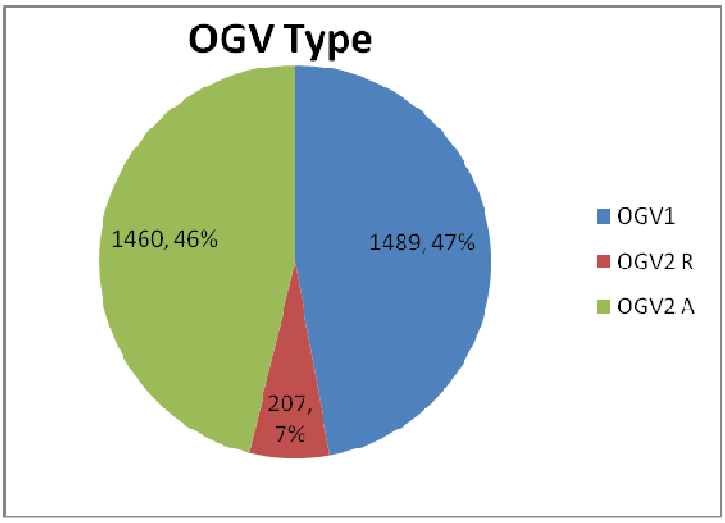
A – Market Street (North)
B – Virginia Street
C – Market Street (South)
D – Guild Street

As this survey recorded vehicles travelling in more than one direction (from more than one location), analysis has been split into **origins** and **destinations** with regard to each of the above locations.

3.2.1 *Proportion of OGV Type*

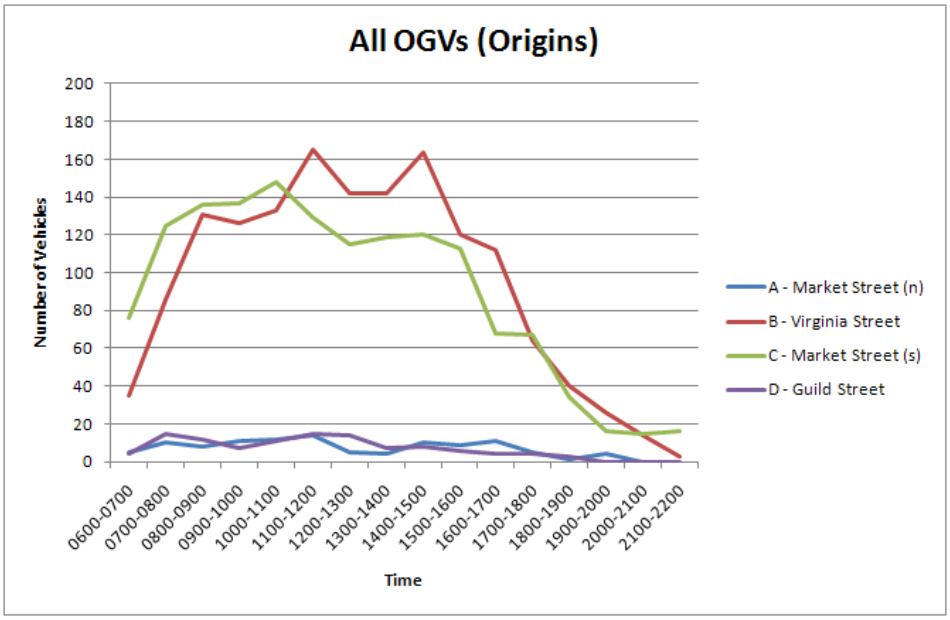
Considering the types of Goods Vehicles entering all arms of the junction, there is a broadly even split between OGV1 and OGV2 articulated. OGV2 Rigid vehicles make up less than 10% of the Goods Vehicles entering the junction.

Figure 3.2 – Proportion of OGV Type, Market Street/Virginia Street



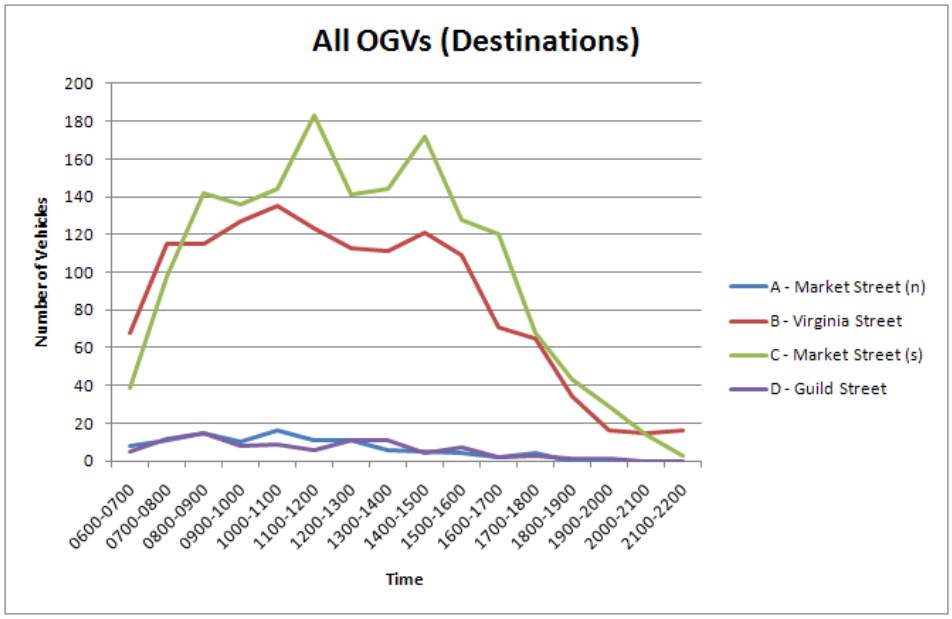
3.2.2 *Total OGVs*

Figure 3.3 – All OGVs (Origins), Market Street/Virginia Street



- A total of 3,156 OGVs were counted entering the junction from each of its arms.
- 2,937 (93%) of the OGVs counted originated from Virginia Street or Market Street (South). This can be broken down into 1,503 OGVs (Virginia Street) and 1,434 OGVs (Market Street (South))
- The pattern for OGVs entering the junction from Market Street differs from the pattern of OGV's entering the junction from Virginia Street. Market Street OGV traffic sees a peak between 9am and 11am (up to 140 OGVs an hour, prior to reducing to around 120 OGVs an hour between lunch and 16.00, and then a significant decline thereafter.
- By contrast, traffic entering the junction from Virginia Street traffic has an early peak of 130 OGVs between 08.00 and 09.00, and then two higher peaks of 160 OGVs and hour (10.00-11.00 and 14.00-15.00) either side of a lunch time dip. After 15.00, activity steadily falls away.
- Differences in usage between Market Street and Virginia Street may point to OGV drivers applying routing preferences – there is greater use of Virginia Street to Market Street, than Market Street to Virginia Street.
- There was considerably less OGV movement from Market Street (North) and Guild Street with no significant peaks in OGV levels apparent over the course of the day.
- The graph for the destinations of all OGVs closely mirrors the pattern for origins.

Figure 3.4 – All OGVs (Destinations), Market Street/Virginia Street



3.2.3 OGV Types

OGV1

Figure 3.5 – OGV1 (Origins), Market Street/Virginia Street

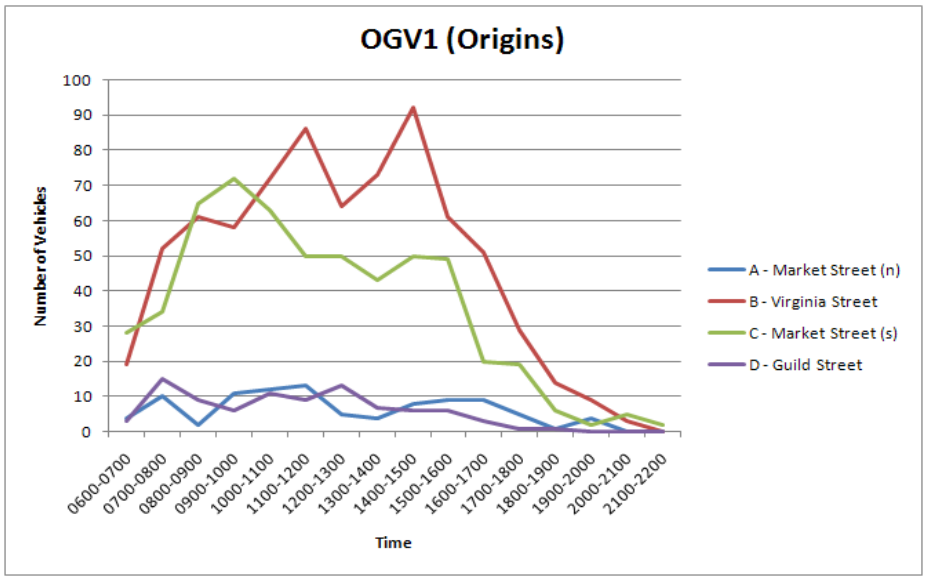
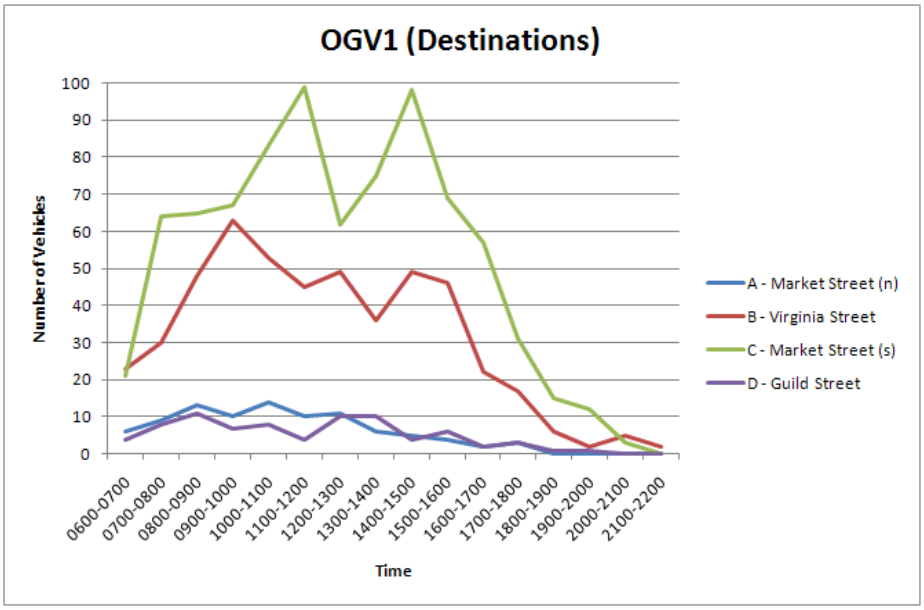


Figure 3.6 – OGV1 (Destinations), Market Street/Virginia Street



- A total of 1,489 OGV1s were counted. 1,302 (87%) of OGV1s counted originated from Virginia Street or Market Street (South). This can be broken down into 744 OGV1s (Virginia Street) and 558 OGV1s Market Street (South) observed during the survey period.

- For vehicles entering the junction, periods of peak OGV1 movement generally correspond with the overall trends for All OGVs outlined above:
  - Virginia Street: 86 (1100-1200) and 92 (1400-1500)
  - There was a slight variation in OGV1 origins from Market Street (South) which peaked in the 0900-1000 hour (and not 1000-1100) with 72 OGV1s

- The graph shows that the majority of the OGV1 movement is towards Market Street (South), in line with the overall assessment for all OGVs
  - 821 OGV1s had a destination of Market Street (South); 496 had a destination of Virginia Street

- The number OGV1s heading towards Market Street again peaked in the 1100-1200 hour (99 vehicles) and the 1400-1500 hour (98 vehicles)

- OGV1s are frequently used for multiple drop deliveries. The early peak from Market Street may represent arrivals of vans into the city from the south. There is a very clear drop off at lunchtime as these delivery drivers stop for lunch. The data also shows a very clear routing preference for the Virginia Street to Market Street direction, over the Market Street to Virginia Street direction.

- The majority of use of Market Street North and Guild Street is for OGV1s.

<u>OGV2 (Rigid)</u>

- A total of 207 OGV2(R) vehicles were counted. These are typically large tipper style lorries, linked to construction or waste management. They are more likely to be linked to local construction firms, and quarries, and waste facilities.

- Despite the relatively low number counted over the 16 hour period, it is worth noting that the pattern for OGV2(R) is the reverse of the general trend for All OGVs
  - 175 vehicles **originated** in Market Street (South) (compared to 21 from Virginia Street) and Virginia Street was the **destination** of 164 Rigid OGVs (compared to 30 for Market Street (South))

- One of the most notable peaks in the level of Rigid OGVs for both origin and destination was the 1000-1100 hour. In this hour:
  - 22 Rigid OGVs originated from Market Street
  - 20 Rigid OGVs travelled towards Virginia Street

- The peak period for Rigid OGVs was at the beginning of the day (0700-0800). In this hour:
  - 25 Rigid OGVs originated from Market Street
  - 21 Rigid OGVs travelled towards Virginia Street

Figure 3.7 – OGV2(R) (Origins), Market Street/Virginia Street

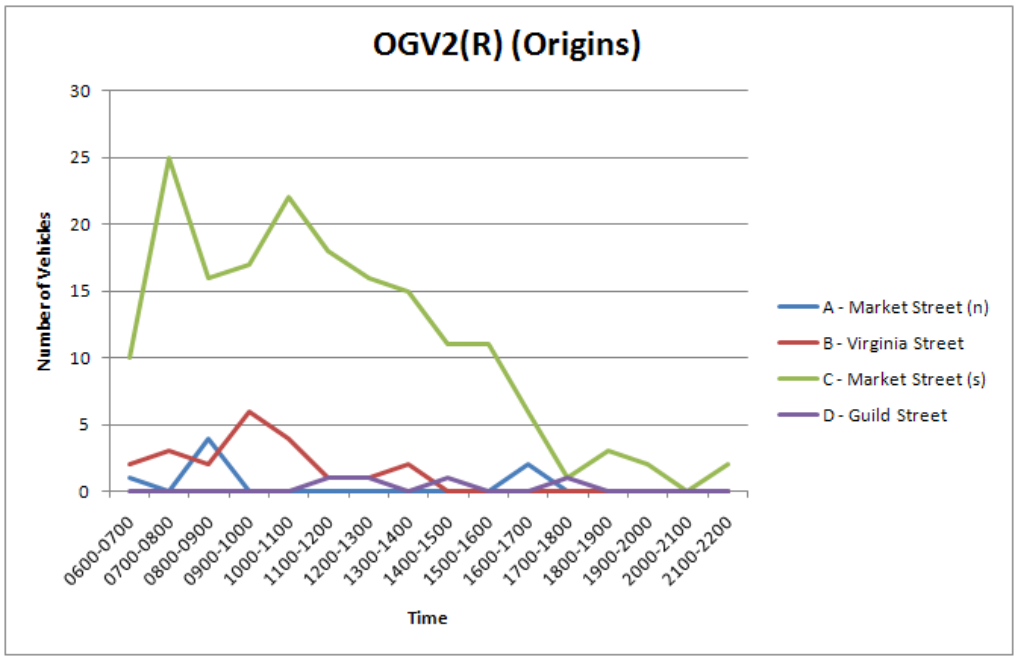
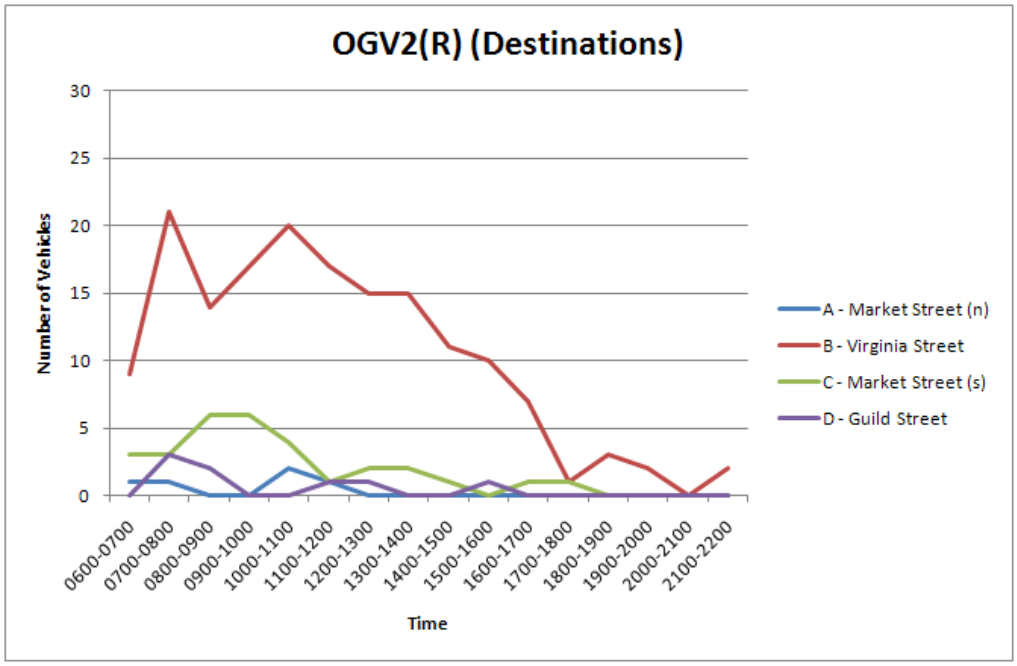


Figure 3.8 – OGV2(R) (Destinations), Market Street/Virginia Street



OGV2 (Articulated)

Figure 3.9 – OGV2(A) (Origins), Market Street/Virginia Street

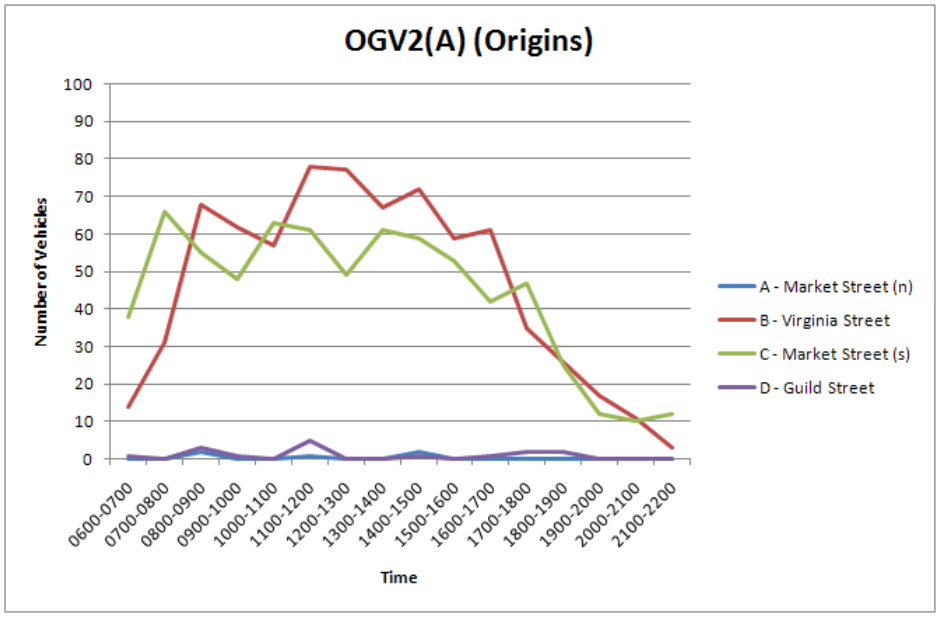
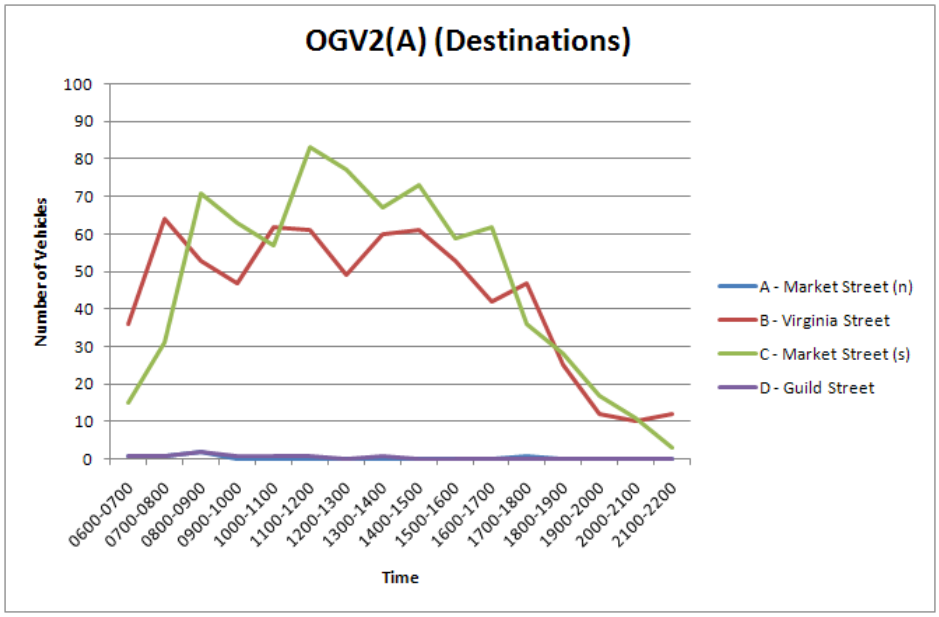


Figure 3.10 – OGV2(A) (Destinations), Market Street/Virginia Street



- A total of 1,460 OGV2(A) vehicles were counted;
- The majority of movements between Market Street (S) to Virginia Street, and Virginia Street to Market Street (S).
- In line with the findings for All OGVs, more articulated vehicles **originated** in Virginia Street (738), compared to Market Street (S) (701).
- For the majority of the working day, there is no distinct peak of activity for articulated vehicles travelling from Market Street (S) to Virginia Street (varying between 50 / 60 per hour), prior to a to a decline after 18.00.
- By contrast, activity for vehicles travelling from Virginia Street to Market Street show a clear peak of 80 vehicles per hour between 11.00 and 12.00, with a particular decline in activity after 17.00.

3.2.4 OGVs and Total Traffic Flow

Table 3.1 – OGVs and Total Traffic Flow, Origin

Site	Total OGVs 0600-2200	Total Vehs 0600-2200	% OGVs of Total Vehs
A – Market Street (North)	109	4,621	**2%**
B – Virginia Street	1,503	15,269	**10%**
C – Market Street (South)	1,434	16,994	**8%**
D – Guild Street	110	6,298	**2%**

Table 3.2 – OGVs and Total Traffic Flow, Destination

Site	Total OGVs 0600-2200	Total Vehs 0600-2200	% OGVs of Total Vehs
A – Market Street (North)	103	3,405	**3%**
B – Virginia Street	1,354	14,980	**9%**
C – Market Street (South)	1,604	18,999	**8%**
D – Guild Street	95	5,798	**2%**

- This overall assessment of OGVs re-confirms the busiest traffic flows as Virginia Street and Market Street (South). It can be seen how significant these locations are as freight routes, with between 8-10% of the total traffic flow between 0600 and 2200 being attributed to OGV traffic.

The relationship in the patterns of HGV movement, and all traffic movement is shown in the diagrams over for traffic entering the junction from Market Street and Virginia Street. Peak HGV flows typically occurs outwith the main peaks for “all traffic”, particularly during the evening peak period.

Capabilities on project:
Transportation

Figure 3.11 – All OGVs and All Vehicles (Origins), Market Street (South)

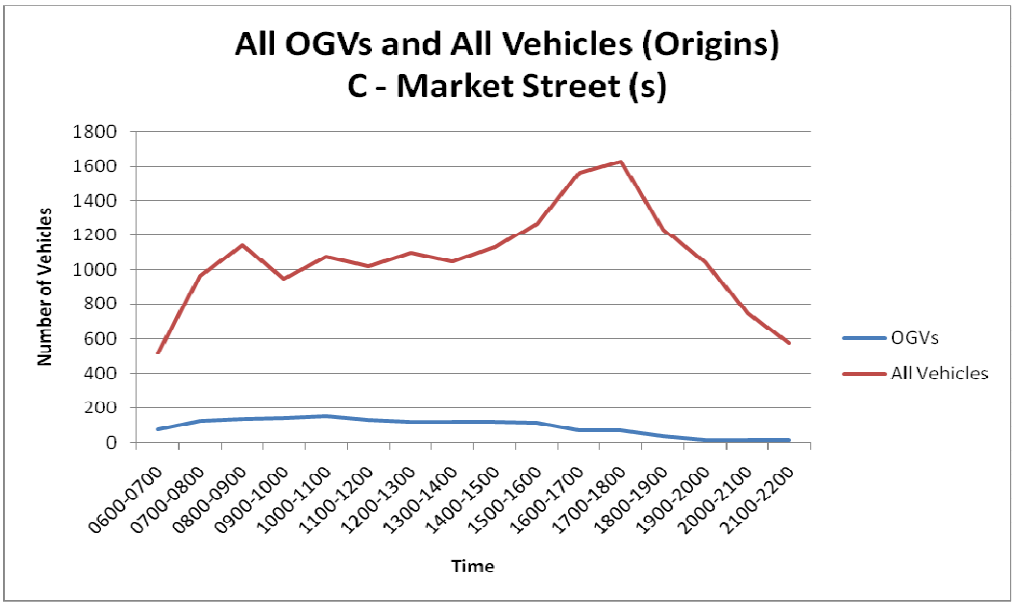
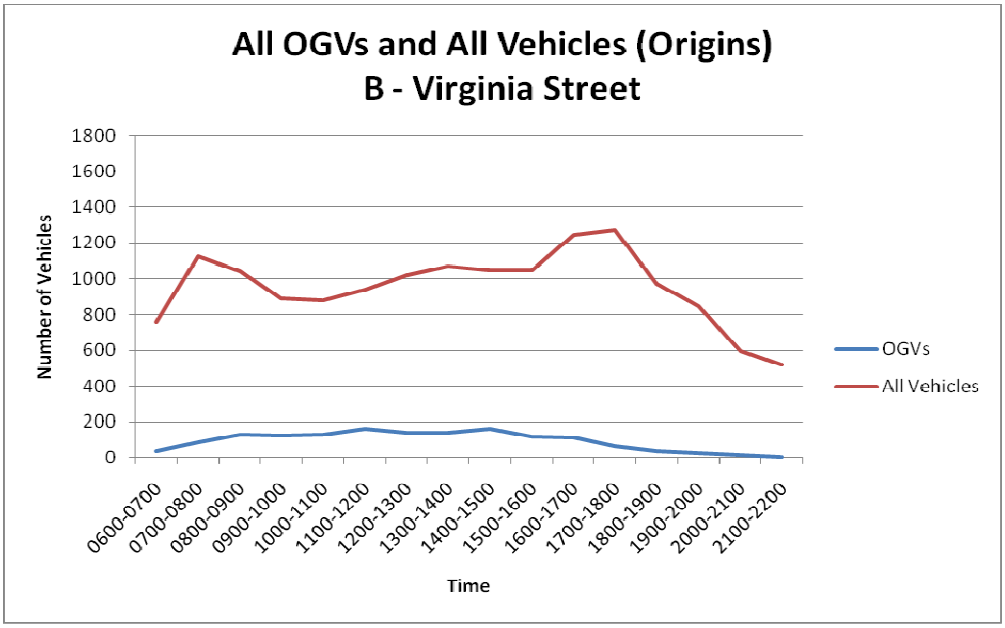


Figure 3.12 – All OGVs and All Vehicles (Origins), Virginia Street



3.3 Riverside Drive

Analysis of the high mast data for Riverside Drive is separated into **northbound** and **southbound** traffic.

Figure 3.13 – Riverside Drive Site Plan

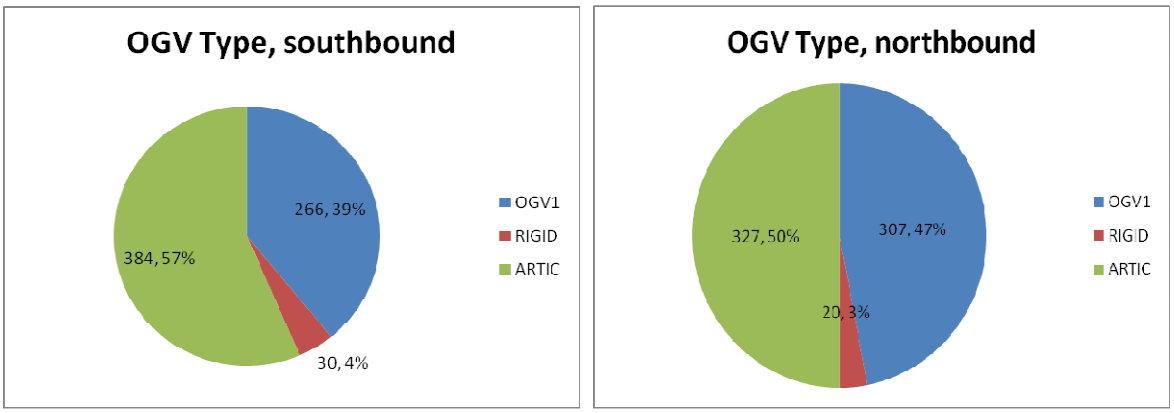
The table below summarises potential destinations of vehicles observed by the northbound and southbound high mast cameras. It is highlighted that Northbound vehicles on Riverside Drive typically are heading from the north of the city to the south of the city and beyond. Conversely, Southbound vehicles on Riverside Drive are typically travelling from the south of the city and beyond to the north of the city.

Table 3.3 – Potential OGV Destinations, Riverside Drive

Camera Location	Potential OGV Destinations
Northbound	• A90 (South) • Wellington Road • Altens/Tullos Industrial Estates • Aberdeen Harbour
Southbound	• A90 (North), A96 • Dyce Industrial Estates

3.3.1 Proportion of OGV Type

Figure 3.14 – Proportion of OGV Type, Riverside Drive



There are proportionately more articulated OGV2's using Riverside Drive southbound, than northbound. Conversely, there are proportionately more OGV1's using Riverside northbound, than southbound.

3.3.2 Total OGVs

- A total of 654 OGVs were counted at Riverside Drive Northbound, and 680 southbound.
- The number of southbound OGVs peaked at 71 in the 0900-1000 hour
- There was a second rise in the number of southbound OGVs in the 1400-1500 hour (reaching 62). A clear drop in activity can be seen at lunchtime.
- The number of OGVs travelling northbound on Riverside Drive peaked at 65 in the 1100-1200 hour. In the following hour (1200-1300), the number dropped to 50, before rising again to 58 between 1300 and 1400. After this point, the number of OGVs travelling southbound on Riverside Drive can be seen to fall consistently, before rising again to 20 between 2000 and 2100.
- For both directions, there is a clear decline in activity after 16.00

Figure 3.15 – All OGVs (Northbound), Riverside Drive

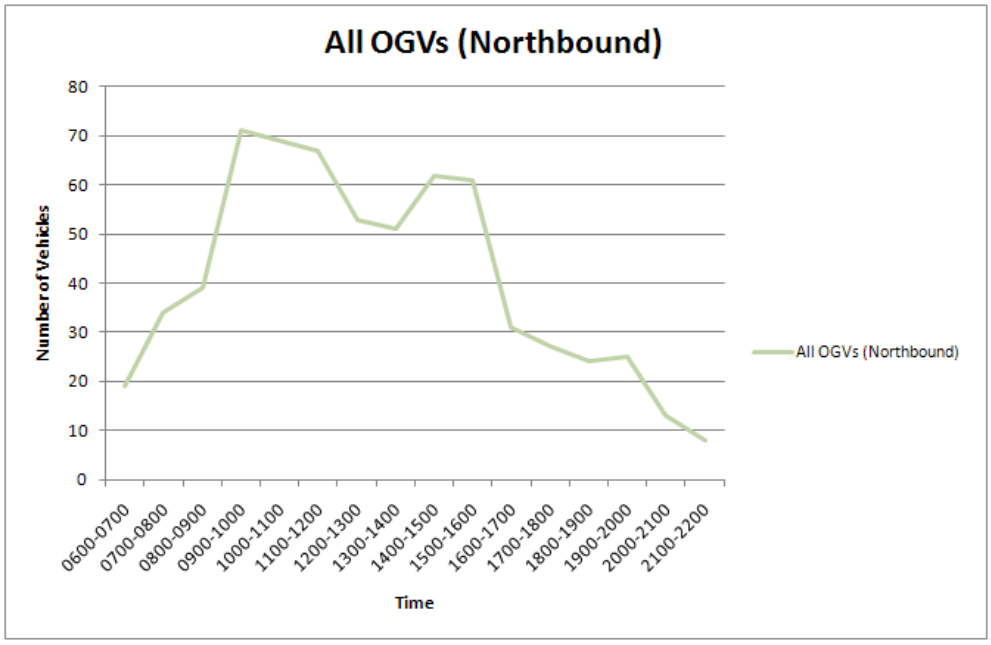
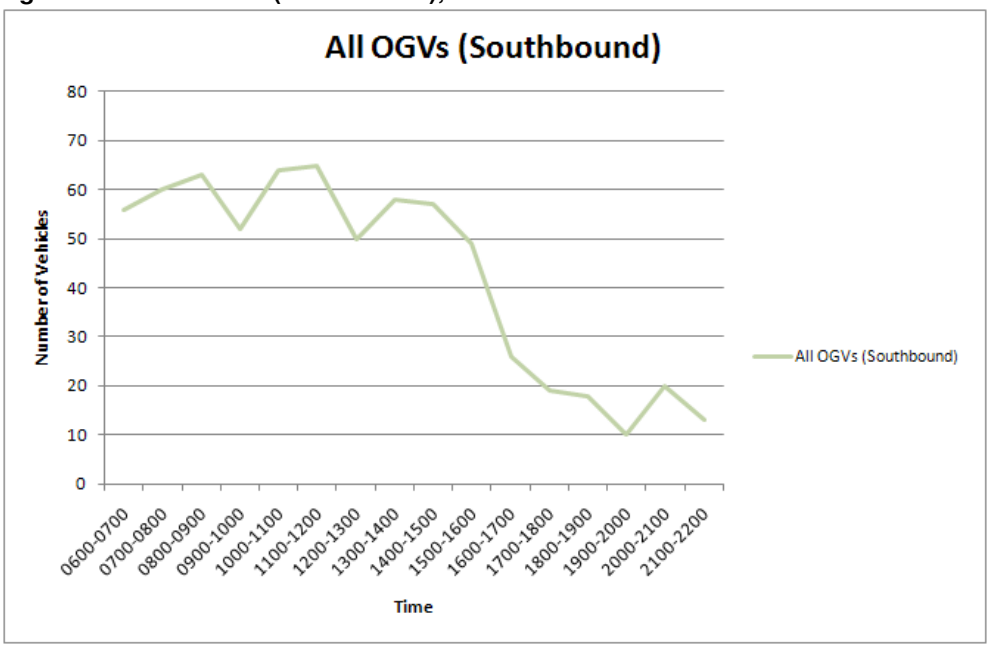


Figure 3.16 – All OGVs (Southbound), Riverside Drive



3.3.3 OGV Types

OGV1

Figure 3.17 – OGV1 (Northbound), Riverside Drive

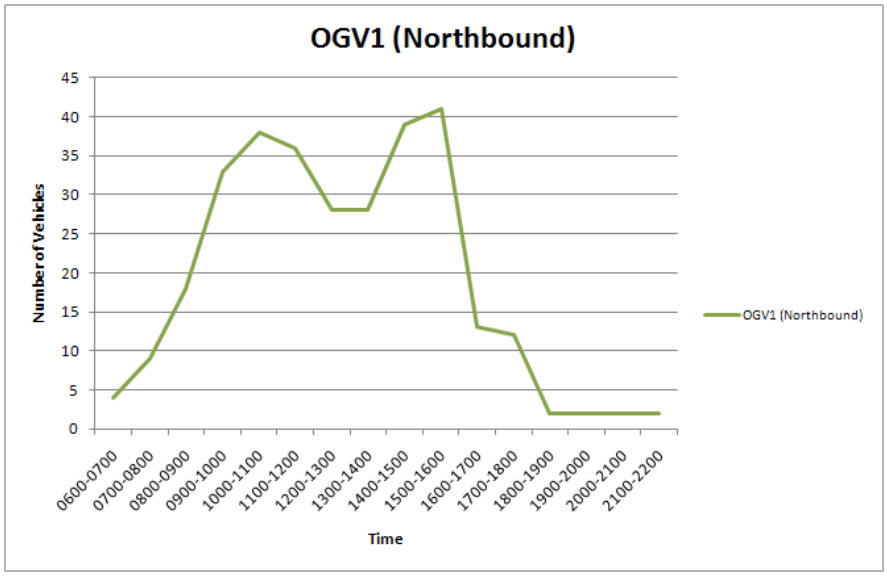
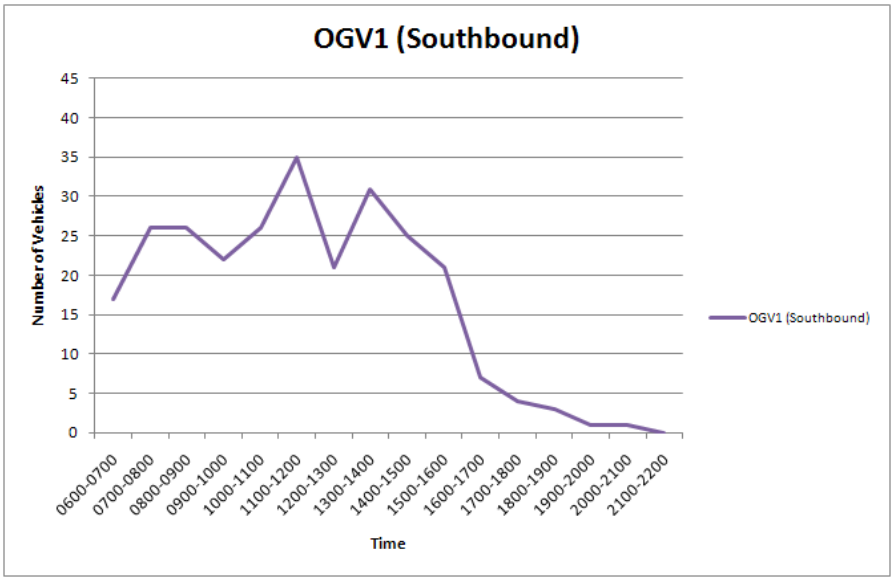


Figure 3.18 – OGV1 (Southbound), Riverside Drive



- A total of 307 OGV1s were counted Northbound on Riverside Drive.
- A total of 266 OGV1s were counted Southbound on Riverside Drive
- There are close similarities between the trend observed for All OGVs and the OGV1 type for Northbound Traffic on Riverside Drive. The two notable peaks on the graph above differ slightly from the All OGVs graph, occurring in the 1000-1100 hour (38 OGV1) and the 1500-1600 hour (41 OGV1). The pattern may be driven by OGV1s being smaller, locally based operators, fitting in with local delivery schedules, with a clear drop during the lunch period.
- Similarly, there are close similarities between the trend observed for All OGVs (Southbound) and the OGV1 (Southbound) type, with the most notable peak periods for OGV1 (Southbound):
  - 35 OGV1 (1100-1200)
  - 31 OGV1 (1300-1400)

<u>OGV2 (Rigid)</u>

Figure 3.19 – OGV2(R) (Northbound), Riverside Drive

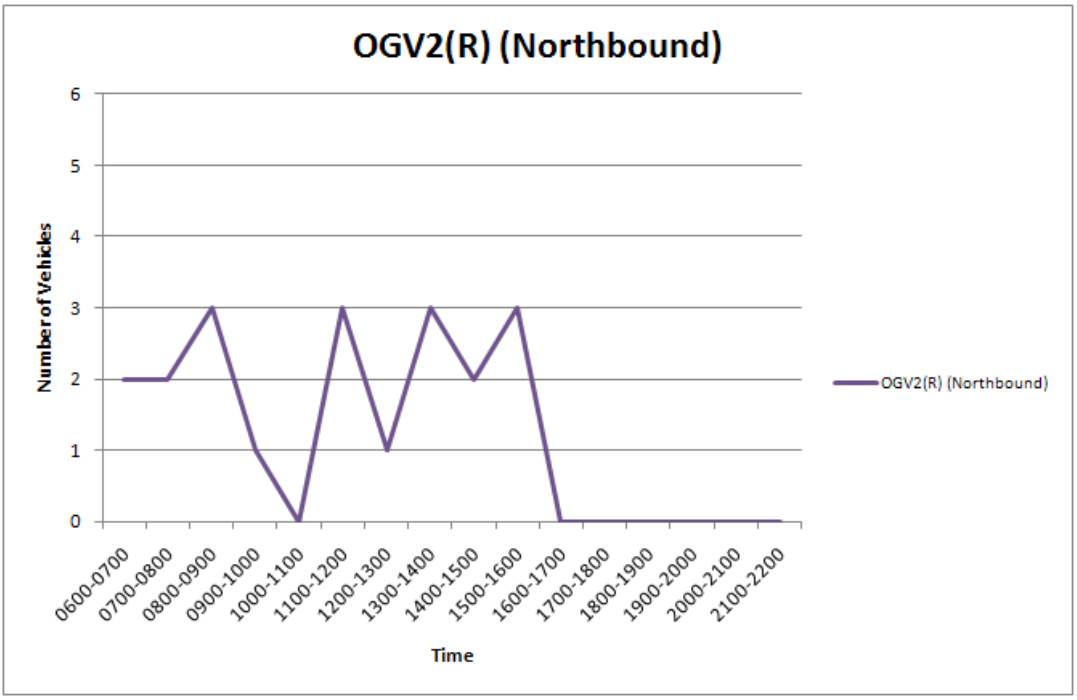
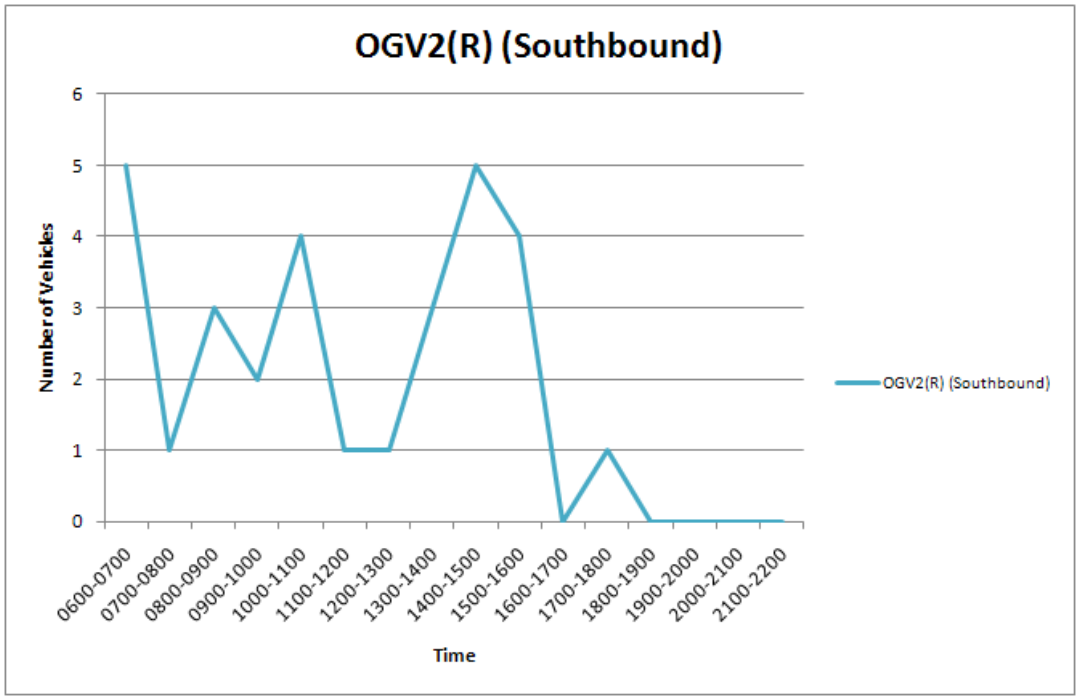


Figure 3.20 – OGV2(R) (Southbound), Riverside Drive



- A total of 20 Rigid OGVs were counted Northbound
- A total of 30 Rigid OGVs were counted Southbound
- Given the small numbers involved, it is more difficult to provide a meaningful assessment of this data, as the highest number of Rigid OGVs counted in any hour was no more than five
- As it was previously suggested, the presence of Rigid OGVs may be representative of local operators. There is a clearer preference for OGV2 Rigids to travel southbound on Riverside Drive.

OGV2 (Articulated)

Figure 3.21 – OGV2(A) (Northbound), Riverside Drive

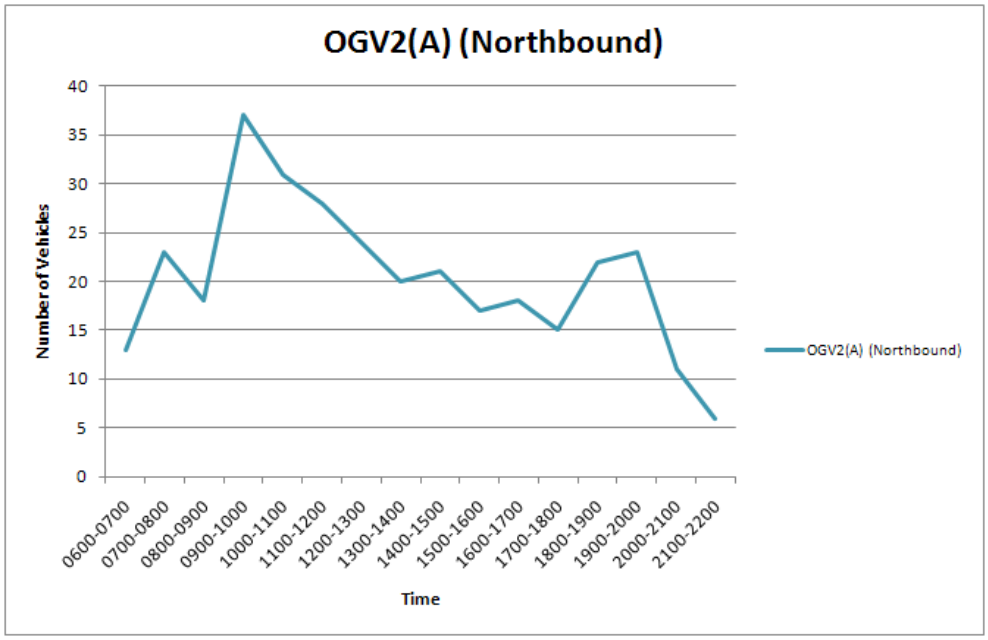
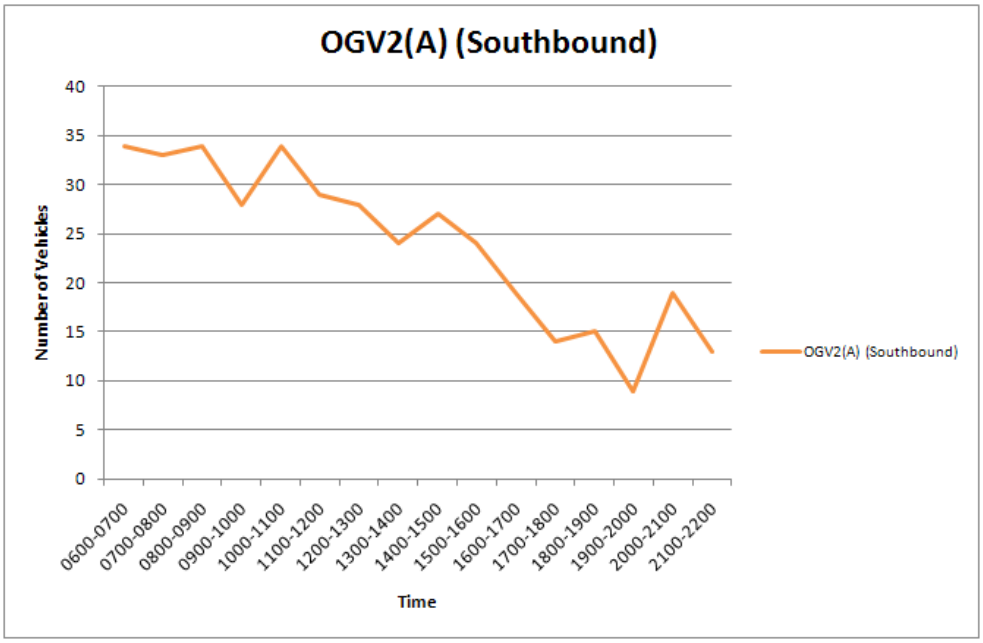


Figure 3.22 – OGV2(A) (Southbound), Riverside Drive



- A total of 327 Articulated OGVs were counted northbound on Riverside Drive, whereas a total 384 Articulated OGVs were counted southbound on Riverside Drive.

- In both the northbound and southbound directions there is a clear peak prior to midday, before slowly declining during the afternoon and early evening. A second and smaller peak can be observed in the late evening both northbound and southbound.

- Northbound traffic on Riverside Drive is arriving from A90 south, and the middle morning peak corresponds with the arrival of central belt based vehicles. The later evening peak may correspond with locally based operators returning from the central belt.

3.3.4 OGVs and Total Traffic Flow

Table 3.4 – OGVs and Total Traffic Flow, Riverside Drive

Site	Total OGVs 0600-2200	Total Vehs 0600-2200	% OGVs of Total Vehs
Northbound	654	2,645	**25%**
Southbound	680	3,187	**21%**

Figure 3.23 – All OGVs and All Vehicles (Northbound), Riverside Drive

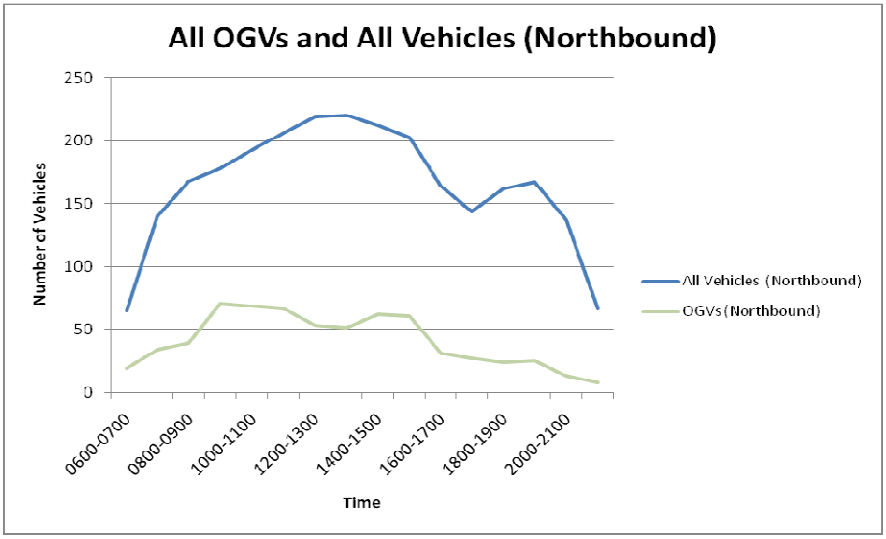
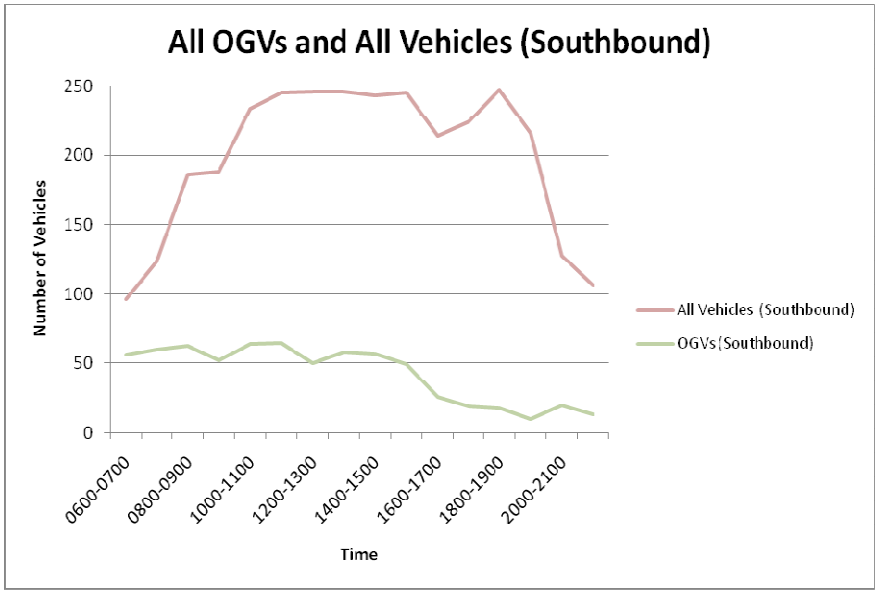


Figure 3.24 – All OGVs and All Vehicles (Southbound), Riverside Drive

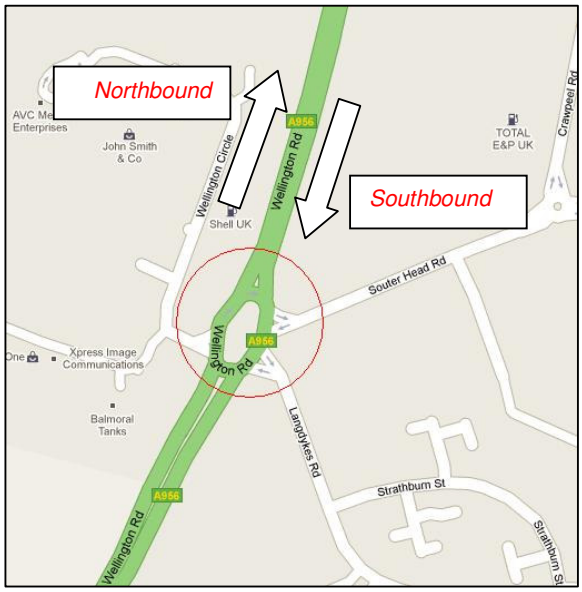


On Holburn Street, there is a much higher percentage of OGVs relative to general traffic, due to its designation as a diversionary route.

3.4 Souterhead Roundabout (Wellington Road)

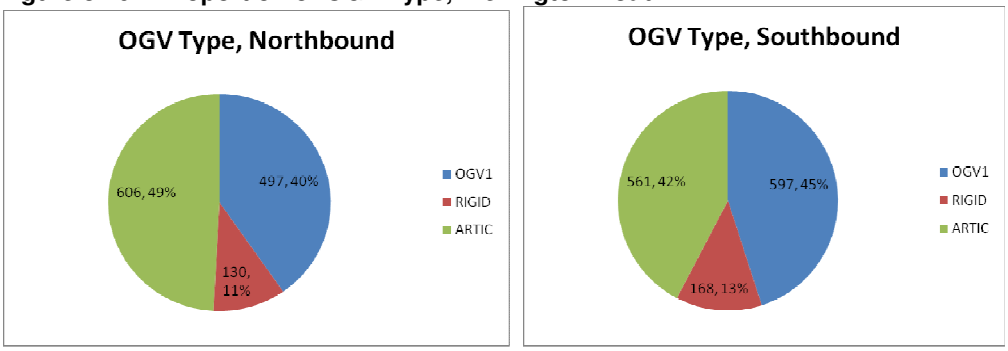
Analysis of the high mast data for Site 3 is also separated into **northbound** and **southbound** traffic. This reflects traffic heading city (north)bound, and traffic heading south towards the A90 (South).

Figure 3.25 – Souterhead Roundabout (Wellington Road) Site Plan



3.4.1 *Proportion of OGV Type*

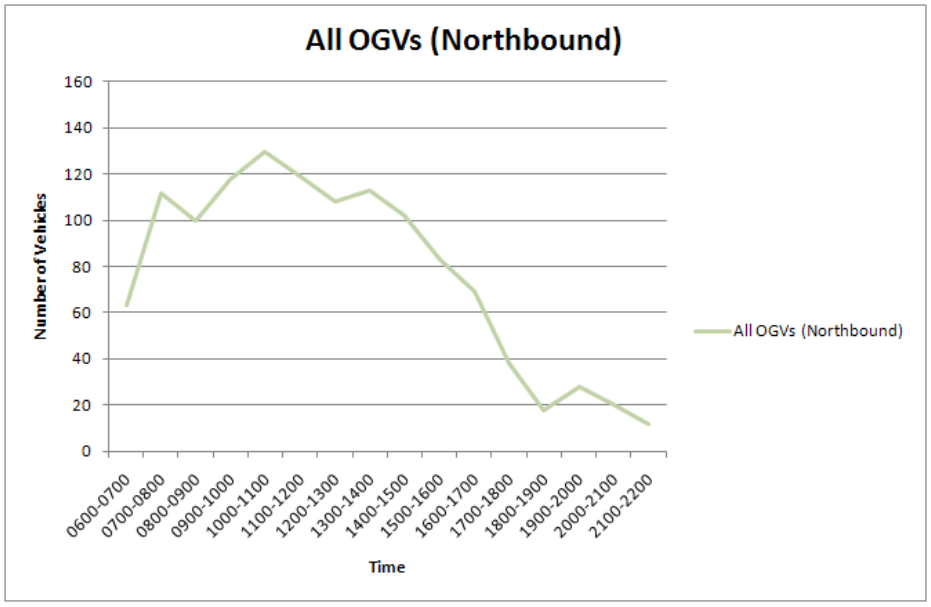
Figure 3.26 – Proportion of OGV Type, Wellington Road



The proportion of goods vehicles on Wellington Road varies by direction, with more articulated goods vehicles Northbound compared to Southbound. By contrast, OGV1 goods vehicles are more numerous southbound relative to the northboudn direction.

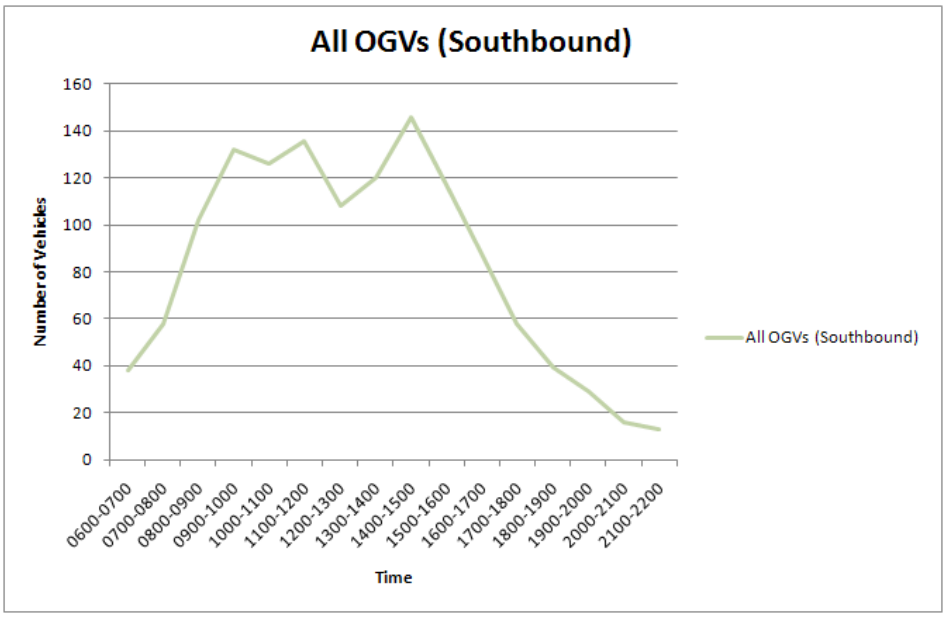
3.4.2 *Total OGVs*

Figure 3.27 – All OGVs (Northbound), Wellington Road



- A total of 1,233 OGVs were counted Northbound. The number of OGVs peaked at 130 in the 1000-1100 hour. There is another rise in the number of OGVs in the 1300-1400 hour (reaching 113). After 15.00, the level of activity steadily falls.

Figure 3.28 – All OGVs (Southbound), Wellington Road



- A total of 1,326 OGVs were counted southbound.
- The number of OGVs peaked at 146 in the 1400-1500 hour. Following this peak, the number of OGVs consistently drops until 2200. As OGVs in this direction are travelling away from Aberdeen, it is likely that all journey requirements were met in the earlier part of the day when the numbers were highest.
- A further comparison can be made between the total number of OGVs observed on Wellington Road and on Market Street.

Figure 3.29 – All OGVs, Market Street-Wellington Road

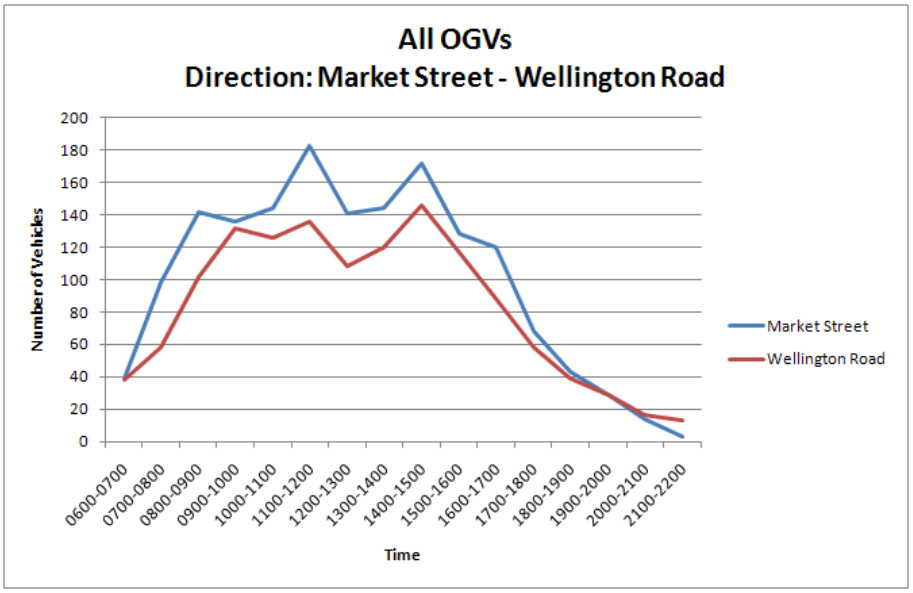
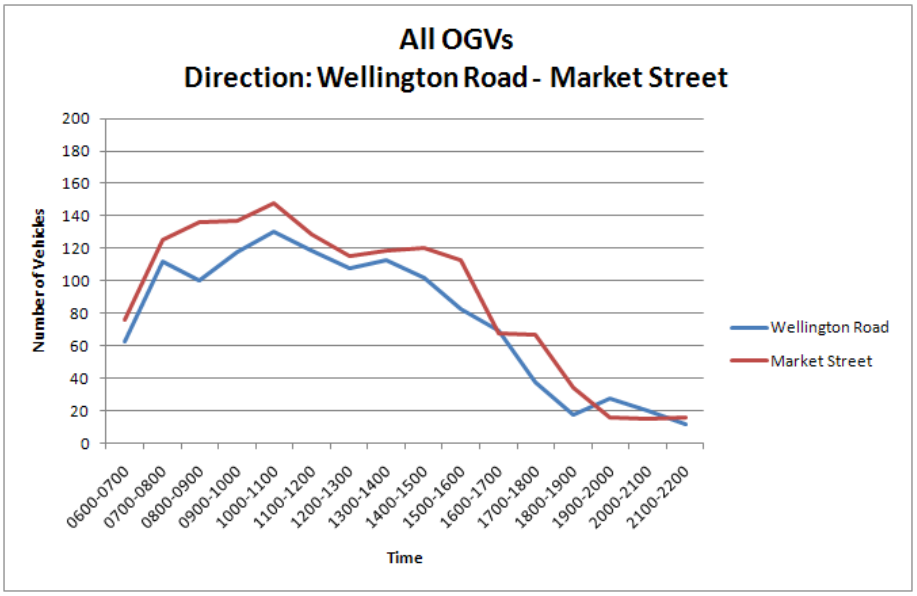


Figure 3.30 – All OGVs, Wellington Road-Market Street

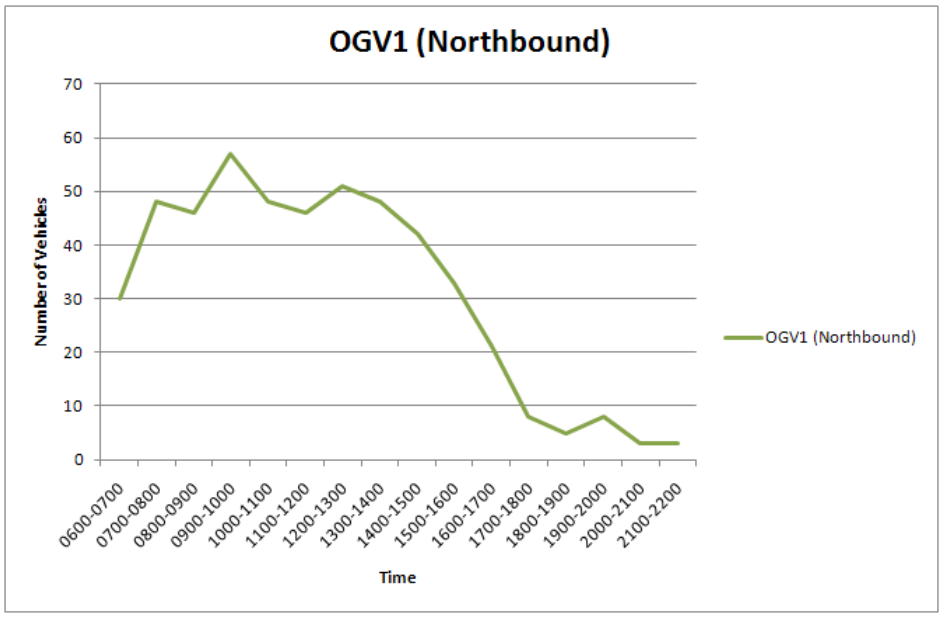


Although the high mast surveys at these two locations were undertaken two months apart, it is still evident that there is a clear correlation between these flows, suggesting that many vehicles accessing Wellington Road from the A90 (South) travel towards Market Street

3.4.3 OGV Types

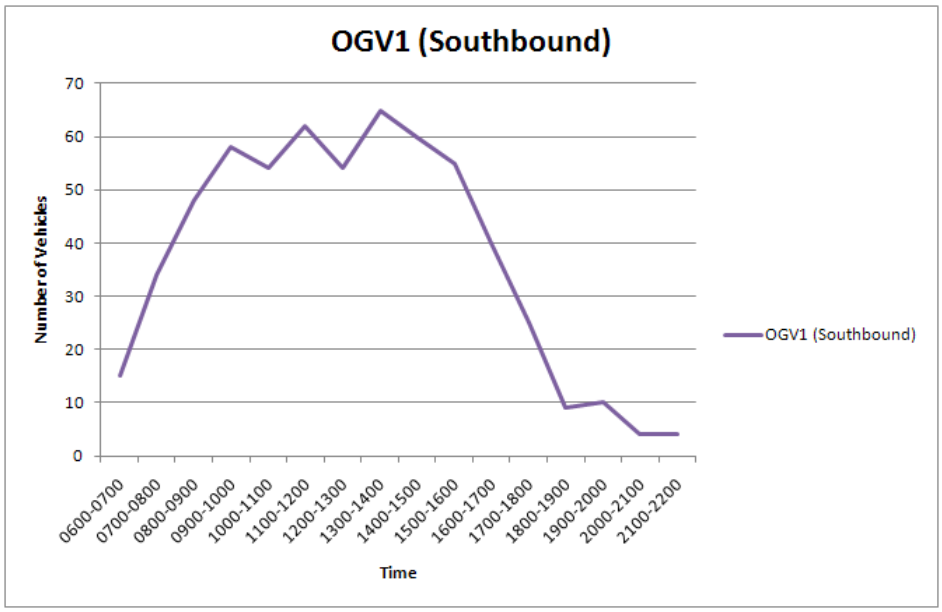
OGV1

Figure 3.31 – OGV1 (Northbound), Wellington Road



- A total of 497 OGV1s were counted
- There are close similarities between the trend observed for All OGVs and the OGV1 type
  - OGV1s peaked an hour earlier (0900-1000) at 57

Figure 3.32 – OGV1 (Southbound), Wellington Road



- A total of 597 OGV1s were counted.
- There are close similarities between the trend observed for All OGVs and the OGV1 type
  - OGV1s peaked an hour earlier (1300-1400) at 65

OV2 (Rigid)

Figure 3.33 – OGV2(R) (Northbound), Wellington Road

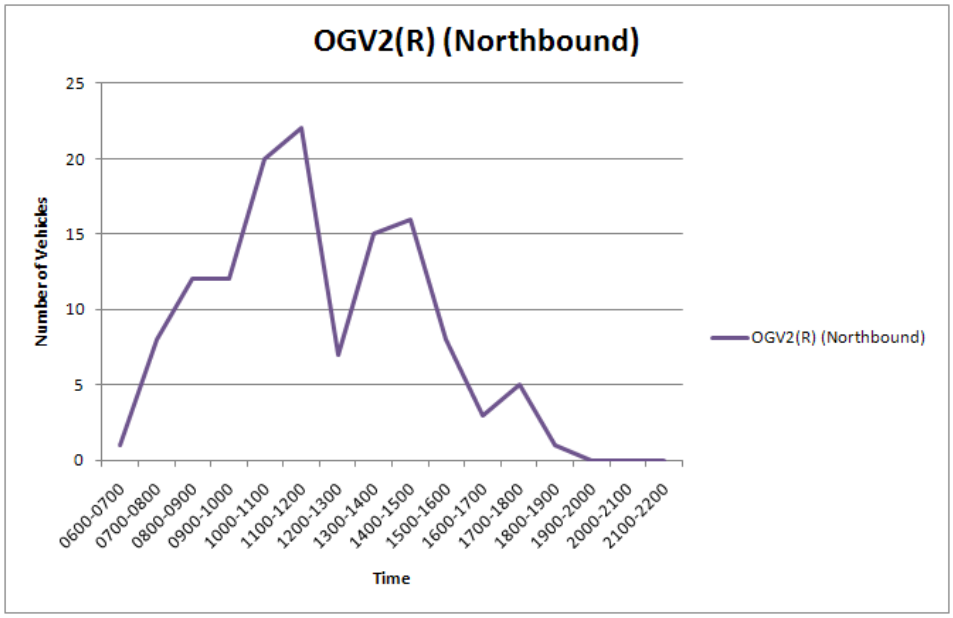
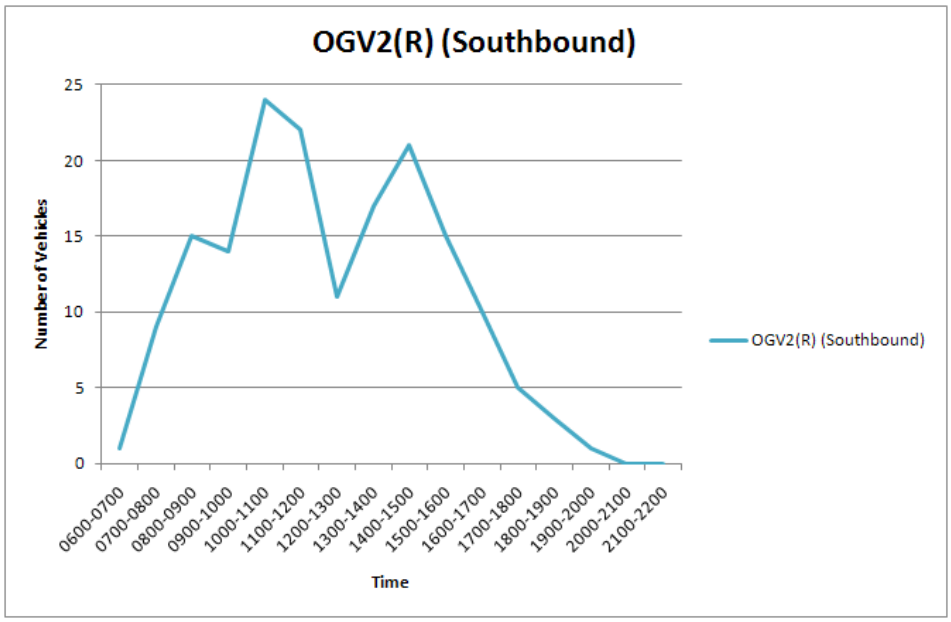


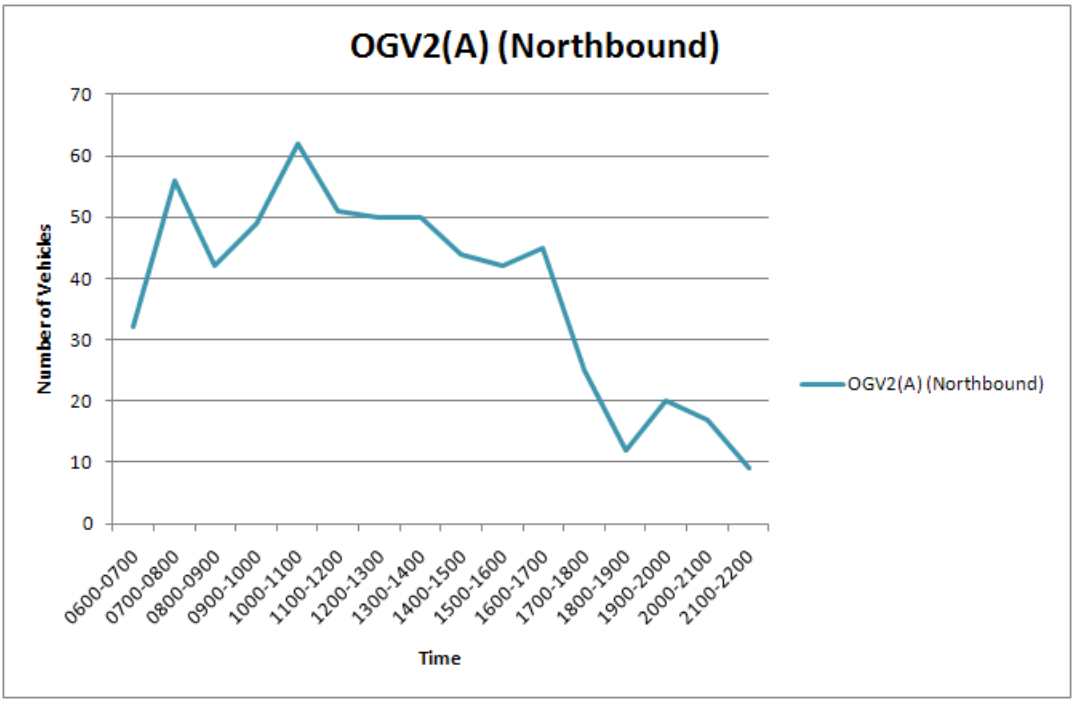
Figure 3.34 – OGV2(R) (Southbound), Wellington Road



- A total of 130 Rigid OGVs were counted Northbound
- A total of 168 Rigid OGVs were counted Southbound
- As the graphs show, there were fewer Rigid OGVs counted than OGV1s
- The trends for both directions are very similar, with both levels peaking notably in the morning at 1100-1200 (Northbound, 22) and 1000-1100 (Southbound, 24) and again in both directions in the 1400-1500 hour (16 – Northbound and 21 – Southbound)

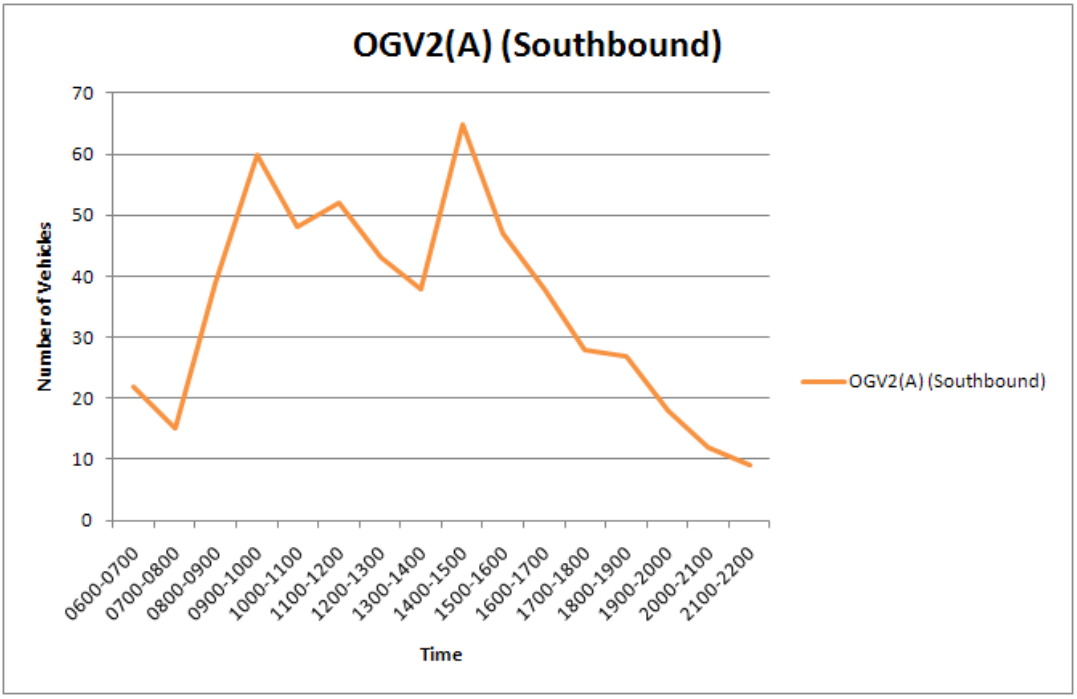
OGV2 (Articulated)

Figure 3.35 – OGV2(A) (Northbound), Wellington Road



- A total of 606 Articulated OGVs were counted
- The biggest movement of OGVs northbound towards Aberdeen City Centre/Aberdeen Harbour was in the morning, with two notable peaks at 0700-0800 (56 vehicles) and 1000-1100 (62 vehicles)
  - It is likely that this accounts for vehicles travelling from the south of Aberdeen to make deliveries/collections etc at the beginning of the day

Figure 3.36 – OGV2(A) (Southbound), Wellington Road



- A total of 561 Articulated OGVs were counted

- The biggest movement of OGVs southbound towards the A90 (South) was in the afternoon, with a peak of 65 vehicles in the 1400-1500 hour
  - It is likely that this figure accounts for the return journeys of OGVs exiting the Aberdeen area following the completion of deliveries/collections etc at the beginning of the day
  - It is also noted that there are 60 articulated OGVs travelling south on Wellington Road early in the day (in the 0900-1000 hour).

3.4.4 OGVs and Total Traffic Flow

Table 3.5 – OGVs and Total Traffic Flow, Wellington Road

Site	Total OGVs 0600-2200	Total Vehs 0600-2200	% OGVs of Total Vehs
Northbound	1,233	7,942	**16%**
Southbound	1,326	10,056	**13%**

- The above analysis demonstrates the importance of Wellington Road as a principal freight route in the Aberdeen area. Although slightly more OGVs were counted on the southbound carriageway, OGVs formed a larger percentage of the total vehicle flow on the northbound carriageway (towards Aberdeen).

Figure 3.37 –All OGVs and All Vehicles (Northbound), Wellington Road

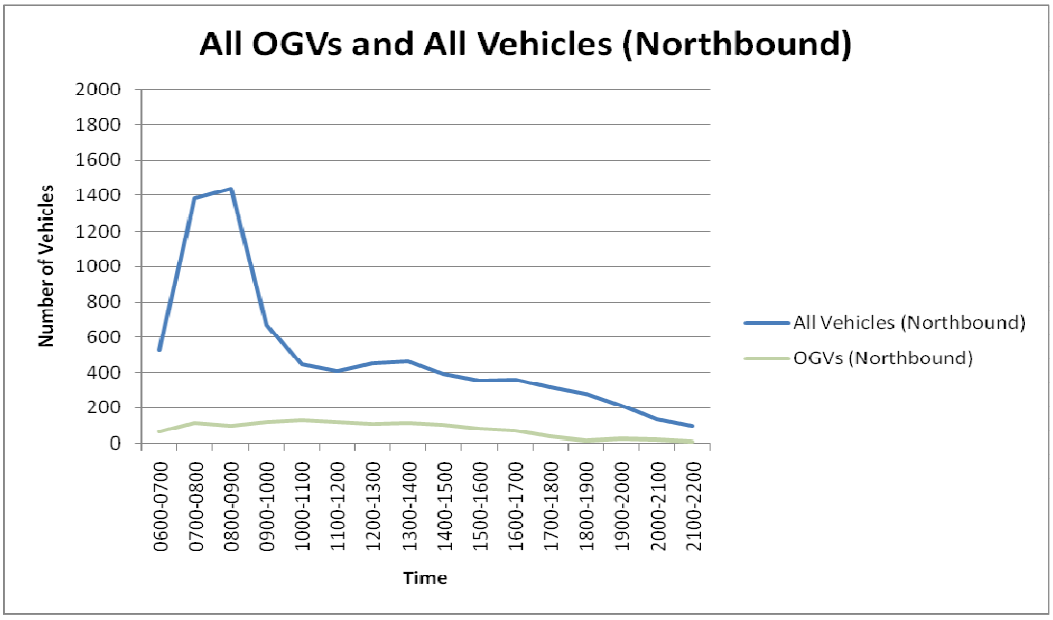
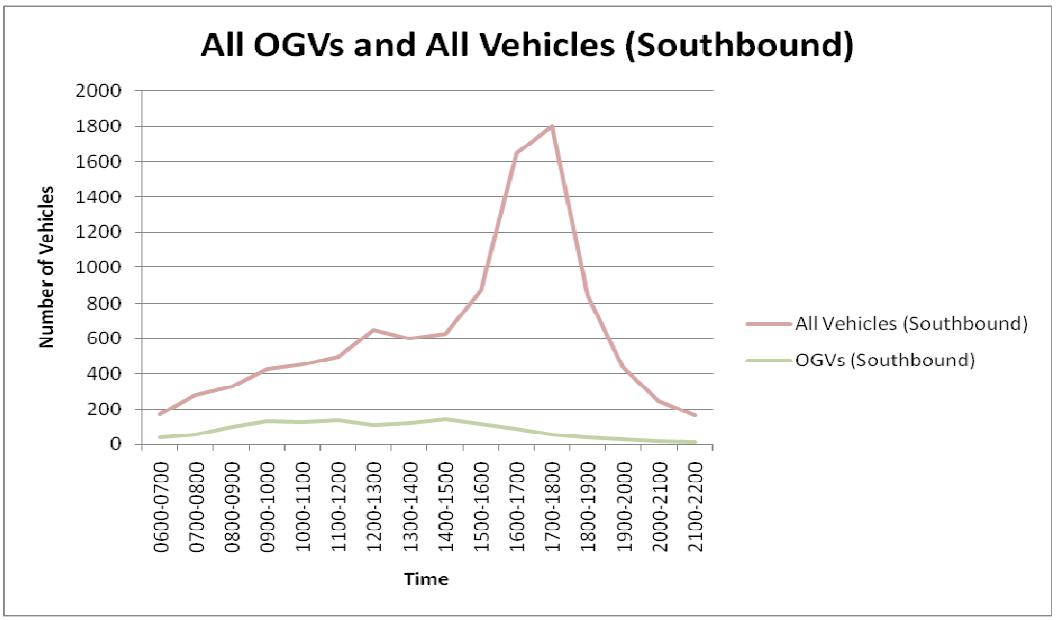


Figure 3.38 –All OGVs and All Vehicles (Southbound), Wellington Road



The graphs above very clearly demonstrate the impact of peak traffic flows at the location, but confirm that the peak freight traffic movements typically do not correspond with the busiest periods of traffic.

3.5 Summary

This chapter has presented some key findings from the results of the high mast video survey.

Firstly, it has confirmed that the busiest route for goods vehicles surveyed is the Market Street/Virginia Street location, with over 2,930 goods vehicles counted over the survey period. Wellington Road at Souterhead Roundabout was the second busiest location, with just over 2,550 goods vehicles recorded during the survey period. The least busy route was at Riverside Drive, where over 1,330 goods vehicles were observed during the survey period.

Different profiles of activity were observed at each location – in particular, there were typically marked difference by direction, and also by different freight vehicle type. These difference will be generate by the different mix of goods vehicles at each location (long haul, short haul, local delivery), and routing choices made by drivers.

There appears to be a clear interrelationship between freight flows on Market Street and Wellington Road, as the patterns observed closely mirror each other. Within Aberdeen City Centre, the majority of movement is between Market Street and Virginia Street, as Guild Street and the north end of Market Street are not suitable for the movement of large freight vehicles.

The surveys also confirmed that the peak periods of freight vehicle movement on these principal routes typically appear to be in the morning or afternoon (rather than later in the day). This may represent the return journeys of freight vehicles which have completed their deliveries or collections in the Aberdeen area and are now returning south. The peaks in freight movement also appear to occur outwith the peaks for all traffic.

Chapter 4 sets out the results of the ground level video surveys undertaken at the three high mast video survey locations.

Ground Level Video Survey Results

4 Ground Level Video Survey Results

4.1 Introduction

Ground level surveys were undertaken at each of the three survey locations:

- Market Street (South);
- Riverside Drive (near Holburn Street); and
- Souterhead Roundabout (Wellington Road).

As this methodology was trialled for the first time as part of the Market Street survey, only city (north)bound traffic was recorded at ground level at this location, but the information collected forms an important part of the results for this study.

Northbound and southbound traffic was recorded at ground level at each of the sites on Riverside Drive (near Holburn Street) and Souterhead Roundabout (Wellington Road).

The following information relating to freight vehicles was recorded in a database by AECOM following detailed review of the recorded ground level footage:

- Registration plate;
- Country of origin;
- Operator name;
- Contact details;
- Unit and body type of observed vehicle;
- Trailer and cab markings; and
- Load type.

Analysis of each location is categorised into the following:

- Total freight vehicles recorded at ground level;
- Comparison against high mast counts; and
- Vehicle unit/body type assessment.

In addition, using the registration plates obtained, an assessment has been made of the EURO engine Standard of the freight vehicles recorded, based on the following dates of implementation of the standards for HGVs[1]:

Table 4.1 – HGV EURO Standard Implementation Dates

Date	EURO Standard
Pre-1992	Pre-EURO
1992 – 30 September 1996	EURO I
1 October 1996 – 30 September 2001	EURO II
1 October 2001 – 30 September 2006	EURO III
1 October 2006 – 30 September 2009	EURO IV
1 October 2009 onwards	EURO V

Operator/contact details have also been analysed to provide an indication of the number of local operators observed during this part of the survey.

[1] *Low Emission Zone Impacts Monitoring Baseline Report – Appendix 1* (Transport for London, July 2008)

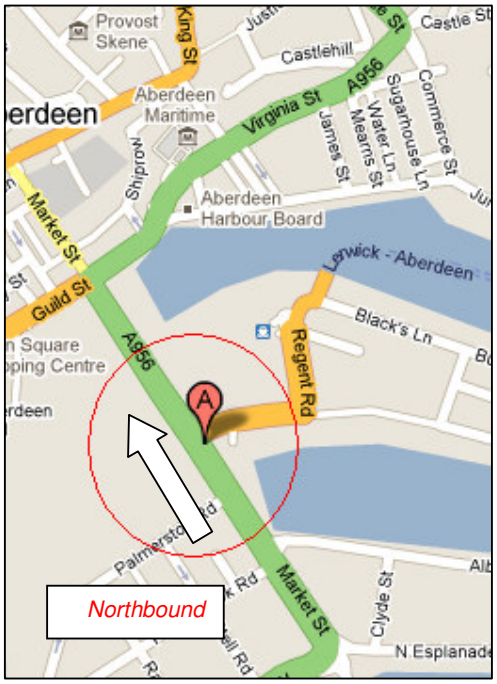
The visual observations at ground level have also been used to determine freight efficiency, by assessing (where possible) the number of laden and unladen vehicles.

All information was recorded in a separate spreadsheet to facilitate analysis.

4.2 Market Street (South)

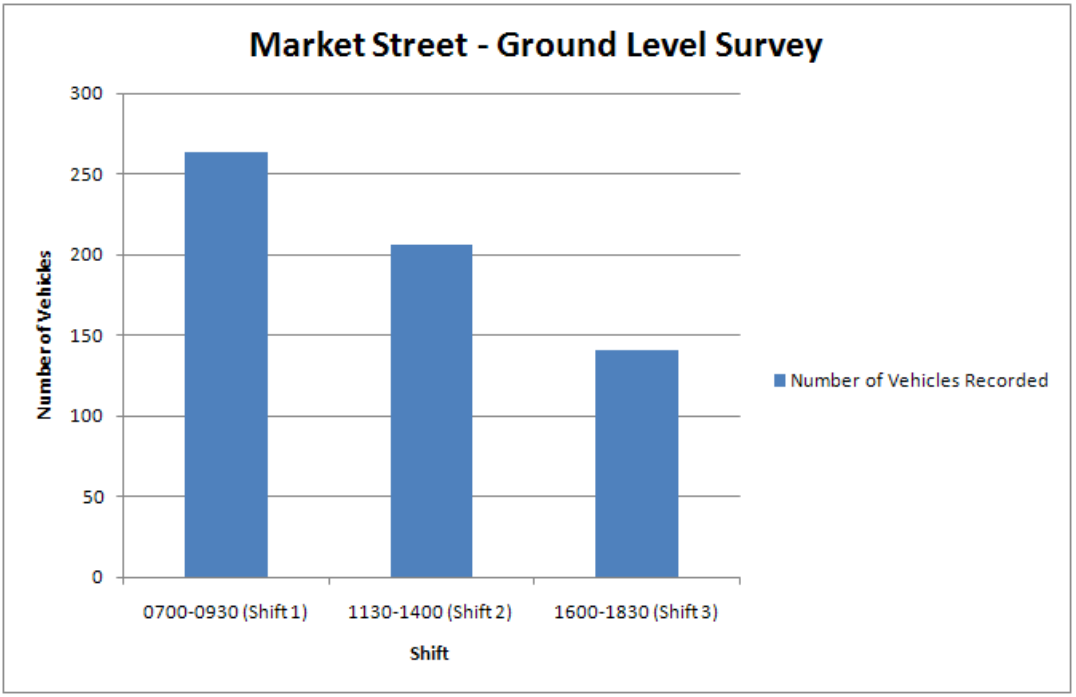
Analysis of the Market Street ground level video data is based on **northbound** traffic originating from Market Street (South) only.

Figure 4.1 – Market Street (South) Site Plan



4.2.1 *Total Freight Vehicles Recorded at Ground Level*

Figure 4.2 – Number of Vehicles Recorded, Market Street (South)



- The number of freight vehicles recorded at ground level was highest in the first shift (totalling 263)
- This decreased to a total of 206 (Shift 2) and 141 (Shift 3)

4.2.2 *Comparison with Total OGVs Recorded (High Mast Survey) within Equivalent Periods*

The number of freight vehicles recorded at ground level can also be compared with the number of OGVs (all types) counted as part of the High Mast Video Survey

Table 4.2 – Ground Level/High Mast Survey Comparison, Market Street (South)

Method	Vehicles Recorded (0700-0930)	Vehicles Recorded (1130-1400)	Vehicles Recorded (1600-1830)	TOTAL
Ground Level	263	206	141	**610**
High Mast	340	298	160	**798**
% of High Mast captured	77%	69%	88%	**76%**

- The ground level survey captured 76% of all OGVs counted by the high mast cameras between 0700 and 0930, 1130 and 1400 and 1600 and 1830.

- As fewer vehicles were passing in the 1600-1830 shift and with greater gaps between them, details of 88% of all OGVs counted by the high mast cameras were recorded and captured

- The 7.5 hour Market Street Ground Level Survey captured 43% of the total 1,434 OGVs counted by the high mast cameras for 16 hours between 0600 and 2200

4.2.3 Unit/Body Type Assessment

Using a classification of vehicle unit and body types, the following types of vehicle were observed as part of the ground level survey on Market Street:

Table 4.3 – Unit/Body Type Assessment, Market Street (South)

Unit Type	Body Type	Total	%
Articulated	Box/refrigerated	33	5%
Articulated	Car transporter	3	0%
Articulated	Curtainsider	55	9%
Articulated	Dry bulk	18	3%
Articulated	Flatbed/empty	57	9%
Articulated	Flatbed/with load	96	16%
Articulated	Gully emptier	2	0%
Articulated	Livestock transporter	2	0%
Articulated	Lowloader/empty	5	1%
Articulated	Lowloader/with load	3	0%
Articulated	Skeletal/with container	15	2%
Articulated	Tanker	32	5%
Articulated	Tipper	19	3%
Articulated/with hiab	Dropside	2	0%
Articulated/with hiab	Flatbed/empty	3	0%
Articulated/with hiab	Flatbed/with load	3	0%
Articulated/with hiab	Lowloader/empty	1	0%
Cab only	N/A	9	1%
Rigid	Bin lorry	6	1%
Rigid	Box/refrigerated	76	12%
Rigid	Car transporter	2	0%
Rigid	Cement mixer	3	0%
Rigid	Curtainsider	58	10%
Rigid	Dropside	13	2%
Rigid	Dry bulk	13	2%
Rigid	Flatbed/empty	10	2%
Rigid	Flatbed/with load	11	2%
Rigid	Gully emptier	4	1%
Rigid	Luton van	4	1%
Rigid	Mobile crane	9	1%
Rigid	Recovery vehicle	2	0%

Unit Type	Body Type	Total	%
Rigid	Removals	4	1%
Rigid	Skip lorry	8	1%
Rigid	Tanker	4	1%
Rigid	Tipper	15	2%
Rigid/with hiab	Dropside	6	1%
Rigid/with hiab	Flatbed/with load	3	0%
Unknown	Unknown	1	0%
TOTAL OBSERVED		**610**	**100%**

- Articulated vehicles accounted for 349 (57%) of the observed vehicles, with rigid vehicles accounting for 251 (41%). 9 of the remaining vehicles were vehicles with a tractor unit (cab) only (1%), while the unit and body type of 1 vehicle was not determined as it was obscured by another vehicle

- Flatbeds were the most common body associated with articulated vehicles, with a total of 159 observed (60 empty and 99 loaded). This high number of flatbeds is likely to represent port related traffic, which forms an important part of freight movement in the Aberdeen area

- Curtainsider bodies were also common across both main unit types, with a total of 55 Articulated/Curtainsider vehicles and 58 Rigid/Curtainsider vehicles

- Lorries with Box/refrigerated bodies were the most common type of Rigid vehicle, totalling 76

4.2.4 Home Bases of Observed Operators

Operator names and contact details were used to help categorise the home bases of the operators identified. For the purposes of this work, “local” has been defined as Aberdeen City and Aberdeenshire.

In addition, in order to further assess the level of freight movement within the Aberdeen City and Aberdeenshire area, some operators have also been categorised as local where they were known or believed to have extensive operations/bases/depots etc in the Aberdeen area.

Table 4.4 – Home Bases of Observed Operators, Market Street (South)

Operator Type	Total	%
Local	391	78%
National Scotland	78	16%
National UK	31	6%
International	3	0.6%
TOTAL	**503**	**100%**
Total Unknown	*107*	
TOTAL (Including Unknown)	***610***	

- The majority of operators identified were local (78%)

- It was not possible to identify the names and details of 107 operators, typically due to the absence of any cab/trailer markings or the quality of the footage of that particular vehicle
  - However, the above table shows that an assessment of base/type was able to be made for 503 of the 610 vehicles recorded (82%)

4.2.5 HGV EURO Standards

Using the registration plates identified from the observed vehicles, it was possible to undertake an assessment of the EURO Standard of each HGV observed at ground level.

Some categories show a combination of two EURO standards. This accounts for registration plates introduced between the dates of implementation of the EURO standards for HGVs.

Table 4.5 – HGV EURO Standards, Market Street (South)

EURO Standard	Total	%
Pre-EURO	0	0%
Pre-EURO/EURO I	0	0%
EURO I	2	0%
EURO I/EURO II	4	1%
EURO II	29	6%
EURO II/EURO III	9	2%
EURO III	241	46%
EURO III/EURO IV	36	7%
EURO IV	179	34%
EURO IV/EURO V	9	2%
EURO V	14	3%
TOTAL	**523**	**100%**
Total Unknown	*87*	
TOTAL (Including Unknown)	***610***	

- EURO III and EURO IV account for the majority (80%) of HGVs observed on Market Street

- It was not possible to determine the EURO standard of 87 vehicles. This was attributed to:
  - The observation of International registration plates, when the introduction of the relevant EURO standard in these countries was unknown;
  - The observation of personalised registration plates; and
  - Being unable to identify the registration plate due to the quality of the footage of that particular vehicle

4.2.6 Laden Vehicles & Freight Efficiency

The table below summarises the total number of vehicles that were confirmed as being laden from the analysis of the Market Street ground level video.

Table 4.6 – Laden Vehicles & Freight Efficiency, Market Street (South)

Vehicle Laden	Total	%
With Load	287	73%
Empty	96	24%
N/A (Cab only)	9	2%
TOTAL	**392**	**100%**
Total Unknown	*218*	
TOTAL (Including Unknown)	***610***	

- 73% of the vehicles observed were confirmed as carrying a load
- Only 96 (24%) of the vehicles were confirmed as being empty (unladen)
- It was not possible to determine whether 218 of the vehicles were laden because of their nature (e.g. Curtainsider, Box/refrigerated

Considering vehicles with confirmed loads and empty vehicles in isolation:

Table 4.6a – Vehicles (With Load) and Vehicles (Empty), Market Street (South)

Vehicle Laden	Total Vehicles	%
With Load	287	75%
Empty	96	25%
TOTAL	**383**	**100%**

- For 3 in every 4 vehicles where an assessment of load type was able to be made, it was confirmed that the vehicle was laden
- These figures reflect the movement of laden vehicles towards Aberdeen Harbour/City Centre from Market Street (South)

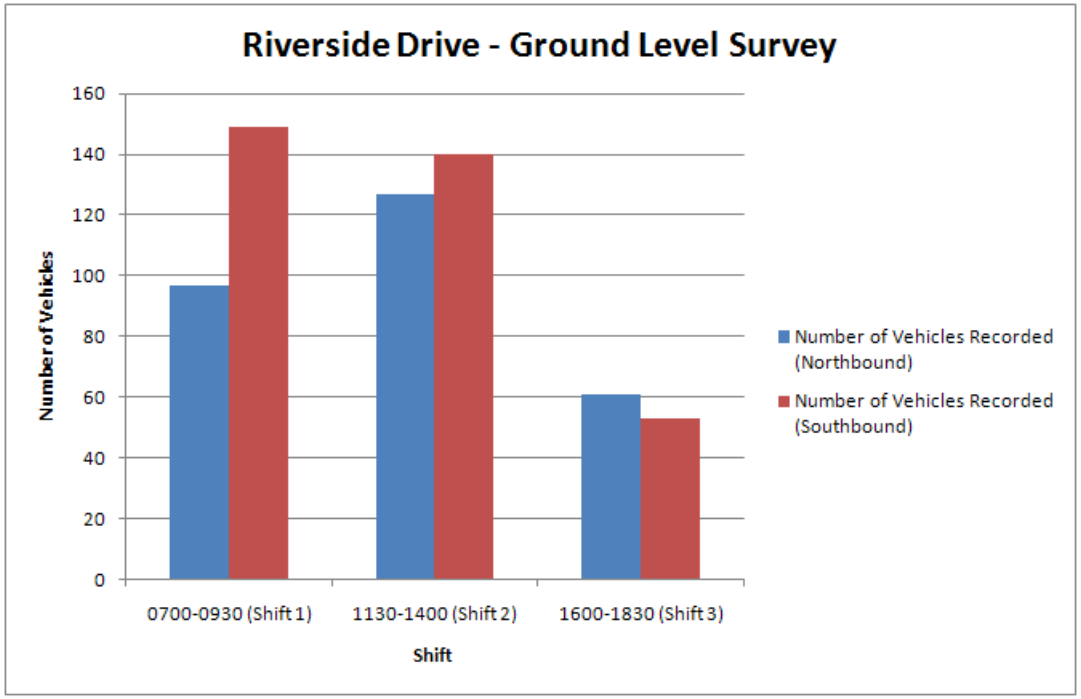
4.3 Riverside Drive

Analysis of the ground level video data for Riverside Drive is separated into **northbound** and **southbound** traffic.

Figure 4.3 – Riverside Drive Site Plan

4.3.1 Total Freight Vehicles Recorded at Ground Level

Figure 4.4 – Number of Vehicles Recorded, Riverside Drive



- A total of 285 vehicles were observed travelling north on Riverside Drive, compared to 342 travelling southbound

- The number of southbound vehicles was highest in the morning shift and totalled 149
  - It is likely that this accounts for the movement of HGV traffic from the south of Aberdeen to key freight destinations to the north of the City such as the Dyce Industrial Estates
  - This conclusion is further strengthened when noting the peak in northbound vehicles on Riverside Drive, which peaks in the 1130-1400 shift at 127. This suggests the completion of deliveries/collections by vehicles in the north of Aberdeen in the morning, which then return south later in the day
  - The number of HGVs observed at ground level is considerably lower in the final shift, with a total of 61 northbound vehicles and 53 southbound vehicles.

The remainder of the analysis of the ground level survey on Riverside Drive considers the two directions separately.

4.3.2 Comparison with Total OGVs Recorded (High Mast Survey) within Equivalent Periods

Northbound

Table 4.7 – Ground Level/High Mast Survey Comparison, Riverside Drive (Northbound)

Method	Vehicles Recorded (0700-0930)	Vehicles Recorded (1130-1400)	Vehicles Recorded (1600-1830)	TOTAL
Ground Level	97	127	61	**285**
High Mast	104	138	70	**312**
% of High Mast captured	93%	92%	87%	**91%**

- The table for northbound traffic shows that this ground level survey captured 91% of all OGVs counted by the high mast cameras between 0700 and 0930, 1130 and 1400 and 1600 and 1830
  - The high percentage of vehicles captured at ground level relative to the high mast count for each shift demonstrates the suitability of the chosen ground level site for capturing vehicles travelling in this direction

- The 7.5 hour ground level survey captured 44% of the total 654 OGVs counted by the high mast cameras for 16 hours between 0600 and 2200

Southbound

Table 4.8 – Ground Level/High Mast Survey Comparison, Riverside Drive (Southbound)

Method	Vehicles Recorded (0700-0930)	Vehicles Recorded (1130-1400)	Vehicles Recorded (1600-1830)	TOTAL
Ground Level	149	140	53	**342**
High Mast	148	136	55	**339**
% of High Mast captured	101%	103%	96%	**101%**

- As the table above suggests, the ground level survey appears to have captured a greater number of vehicles than the high mast camera
  - This is more likely to be explained by the start and finish times of the ground level filming, which will have varied by a few minutes compared to the equivalent time in the high mast camera. These figures therefore show a very high success rate of HGV capture with the ground level camera

- The 7.5 hour ground level survey captured 50% of the total 680 OGVs counted by the high mast cameras for 16 hours between 0600 and 2200

4.3.3 Unit/Body Type Assessment

Northbound

Table 4.9 – Unit/Body Type Assessment, Riverside Drive (Northbound)

Unit Type	Body Type	Total	%
Articulated	Box/refrigerated	24	8%
Articulated	Car transporter	6	2%
Articulated	Curtainsider	30	11%
Articulated	Dropside	1	0%
Articulated	Flatbed/empty	26	9%
Articulated	Flatbed/with load	18	6%
Articulated	Livestock transporter	4	1%
Articulated	Lowloader/empty	3	1%
Articulated	Lowloader/with load	6	2%
Articulated	Recovery vehicle	1	0%
Articulated	Skeletal/with container	5	2%
Articulated	Tanker	8	3%
Articulated	Tipper	10	4%
Articulated/with hiab	Flatbed/empty	3	1%
Articulated/with hiab	Flatbed/with load	1	0%
Cab only	N/A	3	1%
JCB	N/A	1	0%
Rigid	Bin lorry	7	2%
Rigid	Box/refrigerated	28	10%
Rigid	Curtainsider	20	7%
Rigid	Dropside	18	6%
Rigid	Dry bulk	4	1%
Rigid	Flatbed/empty	6	2%
Rigid	Flatbed/with load	6	2%
Rigid	Luton van	3	1%
Rigid	Mobile crane	1	0%
Rigid	Recovery vehicle	4	1%
Rigid	Skeletal/empty	1	0%
Rigid	Skip lorry	12	4%
Rigid	Tanker	3	1%
Rigid	Tipper	8	3%
Rigid/with hiab	Dropside	4	1%
Rigid/with hiab	Flatbed/empty	3	1%
Rigid/with hiab	Flatbed/with load	6	2%
Tractor	N/A	1	0%

Unit Type	Body Type	Total	%
TOTAL OBSERVED		**285**	**100%**

- Articulated vehicles accounted for 146 (51%) of the observed vehicles, with rigid vehicles accounting for 134 (47%). The remaining 5 vehicles (2%) were 3 vehicles with a tractor unit (cab) only, one JCB and one tractor

- Flatbeds were the most common body associated with articulated vehicles, with a total of 48 observed (29 empty and 19 loaded) This high number of flatbeds is likely to represent port related traffic, which forms an important part of freight movement in the Aberdeen area

- Curtainsider bodies were also common across both main unit types, with a total of 30 Articulated/Curtainsider vehicles and 20 Rigid/Curtainsider vehicles

- Lorries with Box/refrigerated bodies were also common, totalling 24 for articulated vehicles and 28 for rigid vehicles

Southbound

Table 4.10 – Unit/Body Type Assessment, Riverside Drive (Southbound)

Unit Type	Body Type	Total	%
Articulated	Box/refrigerated	34	10%
Articulated	Car transporter	6	2%
Articulated	Curtainsider	40	12%
Articulated	Dropside	1	0%
Articulated	Flatbed/empty	12	4%
Articulated	Flatbed/with load	40	12%
Articulated	Livestock transporter	2	1%
Articulated	Lowloader/empty	1	0%
Articulated	Lowloader/with load	8	2%
Articulated	Skeletal/empty	1	0%
Articulated	Skeletal/with container	7	2%
Articulated	Tanker	14	4%
Articulated	Tipper	15	4%
Articulated/with hiab	Flatbed/empty	1	0%
Articulated/with hiab	Flatbed/with load	5	1%
Cab only	N/A	4	1%
Rigid	Bin lorry	6	2%
Rigid	Box/refrigerated	24	7%
Rigid	Cement mixer	2	1%
Rigid	Curtainsider	35	10%
Rigid	Dropside	22	6%
Rigid	Flatbed/empty	2	1%

Unit Type	Body Type	Total	%
Rigid	Flatbed/with load	12	4%
Rigid	Gully emptier	4	1%
Rigid	Luton van	1	0%
Rigid	Mobile crane	3	1%
Rigid	Recovery vehicle	1	0%
Rigid	Skip lorry	10	3%
Rigid	Tanker	4	1%
Rigid	Tipper	10	3%
Rigid (Drawbar)	N/A	3	1%
Rigid/with hiab	Dropside	6	2%
Rigid/with hiab	Flatbed/empty	1	0%
Rigid/with hiab	Flatbed/with load	5	1%
TOTAL OBSERVED		**342**	**100%**

- Articulated vehicles accounted for 187 (55%) of the observed vehicles, with rigid vehicles accounting for 151 (44%). The remaining 4 vehicles were vehicles with a tractor unit (cab) only (1%)

- Flatbeds were the most common body associated with articulated vehicles, with a total of 58 observed (13 empty and 45 loaded) This high number of flatbeds is likely to represent port related traffic, which forms an important part of freight movement in the Aberdeen area

- Curtainsider bodies were also common across both main unit types, with a total of 40 Articulated/Curtainsider vehicles and 35 Rigid/Curtainsider vehicles

- Lorries with Box/refrigerated bodies were also common, totalling 34 for articulated vehicles and 24 for rigid vehicles

Considering all flatbeds (articulated and rigid), it is noted that there were 31 less loaded flatbeds travelling northbound on Riverside Drive over the three periods. It is likely that this accounts for the completion of deliveries to locations in Aberdeen, with the unladen vehicle then returning south. This is further strengthened by comparing the total number of empty flatbeds (articulated and rigid) on northbound vehicles (38) to southbound vehicles (16)

4.3.4 Home Bases of Observed Operators

Northbound

Table 4.11 – Home Bases of Observed Operators, Riverside Drive (Northbound)

Operator Type	Total	%
Local	140	62%
National Scotland	50	22%
National UK	35	15%
International	2	1%
TOTAL	**227**	**100%**
Total Unknown	*58*	
TOTAL (Including Unknown)	***285***	

- The majority of operators identified were local (62%)
- It was not possible to identify the names and details of 58 operators, typically due to the absence of any cab/trailer markings or the quality of the footage of that particular vehicle. However, the above table shows that an assessment of base/type was able to be made for 227 of the 285 vehicles recorded (80%)

Southbound

Table 4.12 – Home Bases of Observed Operators, Riverside Drive (Southbound)

Operator Type	Total	%
Local	179	60%
National Scotland	63	21%
National UK	51	17%
International	4	1%
TOTAL	**297**	**100%**
Total Unknown	*45*	
TOTAL (Including Unknown)	***342***	

- The majority of operators identified were local (60%)
- It was not possible to identify the names and details of 45 operators, typically due to the absence of any cab/trailer markings or the quality of the footage of that particular vehicle.
- However, the above table shows that an assessment of base/type was able to be made for 297 of the 342 vehicles recorded (87%)

4.3.5 HGV EURO Standards

Northbound

Table 4.13 – HGV EURO Standards, Riverside Drive (Northbound)

EURO Standard	Total	%
Pre-EURO	0	0%
Pre-EURO/EURO I	0	0%
EURO I	0	0%
EURO I/EURO II	0	0%
EURO II	21	9%
EURO II/EURO III	3	1%
EURO III	100	41%
EURO III/EURO IV	26	11%
EURO IV	71	29%
EURO IV/EURO V	4	2%
EURO V	16	7%
TOTAL	**241**	**100%**
Total Unknown	*44*	
TOTAL (Including Unknown)	***285***	

- EURO III and EURO IV account for the majority (70%) of HGVs observed on Riverside Drive

- It was not possible to determine the EURO standard of 44 vehicles. This was attributed to:
  - The observation of International registration plates, when the introduction of the relevant EURO standard in these countries was unknown;
  - The observation of personalised registration plates; and
  - Being unable to identify the registration plate due to the quality of the footage of that particular vehicle

Southbound

Table 4.14 – HGV EURO Standards, Riverside Drive (Southbound)

EURO Standard	Total	%
Pre-EURO	0	0%
Pre-EURO/EURO I	0	0%
EURO I	6	2%
EURO I/EURO II	0	0%
EURO II	23	8%
EURO II/EURO III	4	1%
EURO III	99	35%
EURO III/EURO IV	12	4%
EURO IV	102	36%
EURO IV/EURO V	9	3%
EURO V	26	9%
TOTAL	**281**	**100%**
Total Unknown	*61*	
TOTAL (Including Unknown)	***342***	

- EURO III and EURO IV account for the majority (71%) of HGVs observed

- It was not possible to determine the EURO standard of 61 vehicles. This was attributed to:
  - The observation of International registration plates, when the introduction of the relevant EURO standard in these countries was unknown;
  - The observation of personalised registration plates; and
  - Being unable to identify the registration plate due to the quality of the footage of that particular vehicle

4.3.6 Laden Vehicles & Freight Efficiency

Northbound

Table 4.15 – Laden Vehicles & Freight Efficiency, Riverside Drive (Northbound)

Vehicle Laden	Total	%
With Load	81	62%
Empty	46	35%
N/A (Cab only/JCB)	4	3%
TOTAL	**131**	**100%**
Total Unknown	*154*	
TOTAL (Including Unknown)	***285***	

- 62% of the vehicles observed were confirmed as carrying a load

- 46 (35%) of the vehicles were confirmed as being unladen
- It was not possible to determine whether 154 of the vehicles were laden because of their nature (e.g. Curtainsider, Box/refrigerated

Considering vehicles with confirmed loads and empty vehicles in isolation:

Table 4.15a – Vehicles (With Load) and Vehicles (Empty), Riverside Drive (Northbound)

Vehicle Laden	Total Vehicles	%
With Load	81	64%
Empty	46	36%
TOTAL	**127**	**100%**

- For 64% of vehicles where an assessment of load type was able to be made, it was confirmed that the vehicle was laden

Southbound

Table 4.16 – Laden Vehicles & Freight Efficiency, Riverside Drive (Southbound)

Vehicle Laden	Total	%
With Load	123	83%
Empty	21	14%
N/A (Cab only)	4	3%
TOTAL	**148**	**100%**
Total Unknown	*194*	
TOTAL (Including Unknown)	***342***	

- 83% of the vehicles observed were confirmed as carrying a load
- Only 21 (14%) of the vehicles were confirmed as being unladen
- It was not possible to determine whether 194 of the vehicles were laden because of their nature (e.g. Curtainsider, Box/refrigerated

Table 4.16a – Vehicles (With Load) and Vehicles (Empty), Riverside Drive (Southbound)

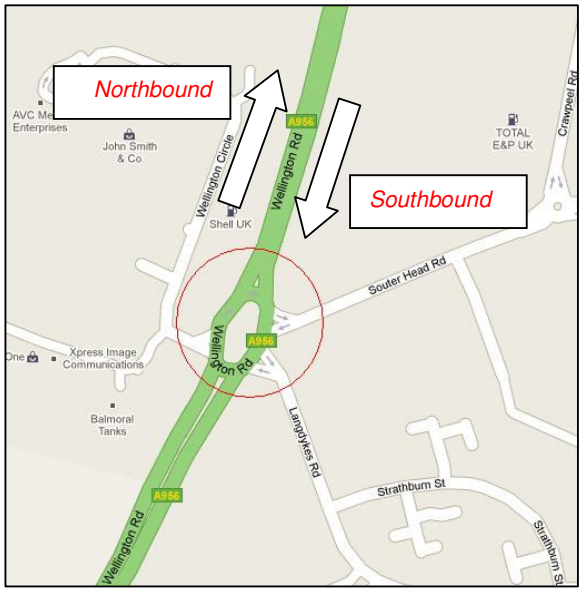
Vehicle Laden	Total Vehicles	%
With Load	123	85%
Empty	21	15%
TOTAL	**144**	**100%**

- For 85% of vehicles where an assessment of load type was able to be made, it was confirmed that the vehicle was laden
- This is a higher total (and percentage) than was observed for northbound vehicles. This may reflect the undertaking of **deliveries** to locations north of Aberdeen (e.g. Dyce) prior to the vehicle returning south unladen

4.4 Souterhead Roundabout (Wellington Road)

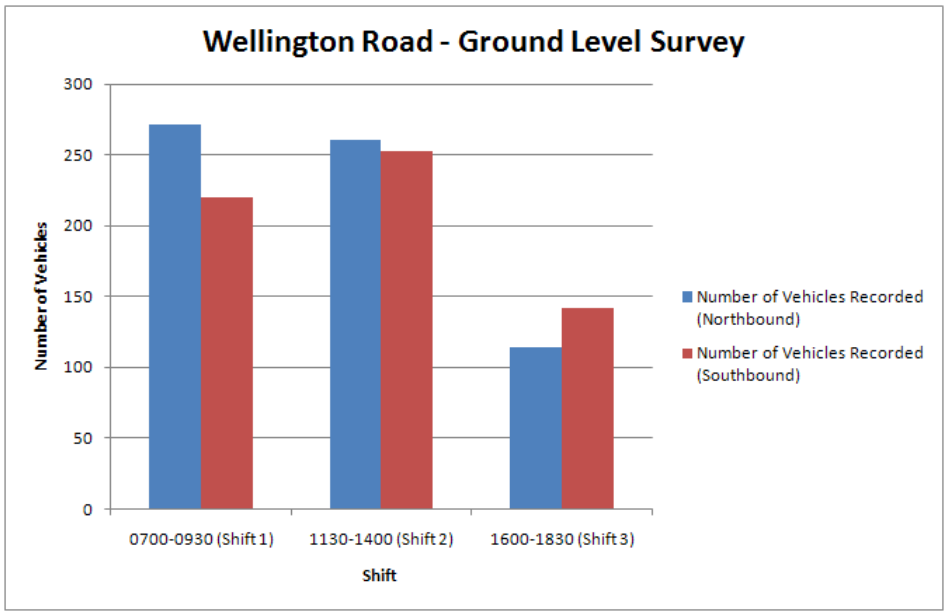
Analysis of the ground level video data for Wellington Road is separated into **northbound** and **southbound** traffic.

Figure 4.5 – Souterhead Roundabout (Wellington Road) Site Plan



4.4.1 Total Freight Vehicles Recorded at Ground Level

Figure 4.6 – Number of Vehicles Recorded, Wellington Road



- A total of 646 vehicles was observed travelling northbound on Wellington Road, compared to 615 travelling southbound

- The number of vehicles travelling northbound was highest in the morning shift and totalled 271
  - It is likely that this accounts for the movement of HGV traffic from the south of Aberdeen to key freight destinations such as Aberdeen Harbour
  - This conclusion is further strengthened when noting the peak in vehicles travelling southbound, which peaks in the 1130-1400 shift at 253. As has been previously suggested, this is likely to be indicative of the completion of deliveries/collections by vehicles in Aberdeen in the morning, which are then returning south later in the day
  - The number of HGVs observed at ground level is considerably lower in the final shift, with a total of 114 (northbound) and 142 (southbound). Again, it is likely that this number can be explained by the reasons cited above, as non-local operators (where the driver is not staying overnight) are less likely to still be in the area at this point in the day

The remainder of the analysis of the ground level survey on Wellington Road considers the northbound and southbound results separately.

4.4.2 Comparison with Total OGVs Recorded (High Mast Survey) within Equivalent Periods

Northbound

Table 4.17 – Ground Level/High Mast Survey Comparison, Wellington Road (Northbound)

Method	Vehicles Recorded (0700-0930)	Vehicles Recorded (1130-1400)	Vehicles Recorded (1600-1830)	TOTAL
Ground Level	271	261	114	**646**
High Mast	281	274	115	**670**
% of High Mast captured	96%	95%	99%	**96%**

- The table for northbound traffic shows that this ground level survey captured 96% of all OGVs counted by the high mast cameras between 0700 and 0930, 1130 and 1400 and 1600 and 1830
  - The high percentage of vehicles captured at ground level relative to the high mast count for each shift demonstrates the suitability of the chosen ground level site for capturing vehicles travelling in this direction

- The 7.5 hour ground level survey captured 52% of the total 1,233 OGVs counted by the high mast cameras for 16 hours between 0600 and 2200

Southbound

Table 4.18 – Ground Level/High Mast Survey Comparison, Wellington Road (Southbound)

Method	Vehicles Recorded (0700-0930)	Vehicles Recorded (1130-1400)	Vehicles Recorded (1600-1830)	TOTAL
Ground Level	220	253	142	**615**
High Mast	224	294	168	**686**
% of High Mast captured	98%	86%	85%	**90%**

- The table for southbound traffic shows that this ground level survey captured 90% of all OGVs counted by the high mast cameras between 0700 and 0930, 1130 and 1400 and 1600 and 1830
  - The comparative difference in the % of high mast vehicles captured in the 1130-1400 and 1600-1830 shifts northbound and southbound can be attributed to a deterioration in the weather over the course of the day (which was exacerbated by south facing rain)

- The 7.5 hour ground level survey captured 46% of the total 1,326 OGVs counted by the high mast cameras for 16 hours between 0600 and 2200

4.4.3 Unit/Body Type Assessment

Northbound

Table 4.19 – Unit/Body Type Assessment, Wellington Road (Northbound)

Unit Type	Body Type	Total	%
Articulated	Box/refrigerated	61	9%
Articulated	Car transporter	10	2%
Articulated	Curtainsider	81	13%
Articulated	Dry bulk	15	2%
Articulated	Flatbed/empty	26	4%
Articulated	Flatbed/with load	66	10%
Articulated	Livestock transporter	2	0%
Articulated	Lowloader/empty	6	1%
Articulated	Lowloader/with load	13	2%
Articulated	Lowloader/unknown if laden	1	0%
Articulated	Skeletal/with container	11	2%
Articulated	Skeletal/with tanker	2	0%
Articulated	Tanker	18	3%
Articulated	Tipper	3	0%
Articulated/with hiab	Flatbed/empty	1	0%
Cab only	N/A	7	1%
Rigid	Bin lorry	3	0%
Rigid	Box/refrigerated	52	8%
Rigid	Cement mixer	1	0%
Rigid	Curtainsider	61	9%
Rigid	Dropside	80	12%
Rigid	Dropside/with trailer	2	0%
Rigid	Dry bulk	9	1%
Rigid	Flatbed/empty	6	1%
Rigid	Flatbed/with load	15	2%
Rigid	Hotbox	2	0%
Rigid	Livestock transporter	1	0%
Rigid	Luton van	1	0%
Rigid	Mobile crane	6	1%
Rigid	Road maintenance	1	0%
Rigid	Skip lorry	16	2%
Rigid	Small trailer	1	0%
Rigid	Tanker	4	1%

Unit Type	Body Type	Total	%
Rigid	Tipper	51	8%
Rigid	Tipper/with trailer	1	0%
Rigid (Drawbar)	N/A	4	1%
Rigid/with hiab	Dropside	2	0%
Rigid/with hiab	Flatbed/with load	1	0%
Rigid/with hiab	Tipper	3	0%
TOTAL OBSERVED		**646**	**100%**

- Articulated vehicles accounted for 316 (49%) of the observed vehicles, with rigid vehicles accounting for 323 (50%). The remaining 7 vehicles were vehicles with a tractor unit (cab) only (1%)

- Flatbeds were the most common body associated with articulated vehicles, with a total of 93 observed (27 empty and 66 loaded) This high number of flatbeds is likely to represent port related traffic, which forms an important part of freight movement in the Aberdeen area

- Curtainsider bodies were also common across both main unit types, with a total of 81 Articulated/Curtainsider vehicles and 61 Rigid/Curtainsider vehicles

- Lorries with Box/refrigerated bodies were also common, totalling 61 for articulated vehicles and 52 for rigid vehicles

Southbound

Table 4.20 – Unit/Body Type Assessment, Wellington Road (Southbound)

Unit Type	Body Type	Total	%
Articulated	Box/refrigerated	61	10%
Articulated	Car transporter	3	0%
Articulated	Curtainsider	38	6%
Articulated	Dry bulk	8	1%
Articulated	Flatbed/empty	41	7%
Articulated	Flatbed/with load	48	8%
Articulated	Livestock transporter	3	0%
Articulated	Lowloader/empty	3	0%
Articulated	Lowloader/with load	7	1%
Articulated	Skeletal/empty	1	0%
Articulated	Skeletal/with container	14	2%
Articulated	Tanker	25	4%
Cab only	N/A	5	1%
Rigid	Bin lorry	6	1%
Rigid	Box/refrigerated	80	13%

Unit Type	Body Type	Total	%
Rigid	Car transporter	3	0%
Rigid	Cement mixer	2	0%
Rigid	Curtainsider	49	8%
Rigid	Dropside	74	12%
Rigid	Dry bulk	2	0%
Rigid	Dry bulk/with trailer	1	0%
Rigid	Flatbed/empty	10	2%
Rigid	Flatbed/with load	14	2%
Rigid	Gully emptier	1	0%
Rigid	Horsebox	2	0%
Rigid	Livestock transporter	1	0%
Rigid	Mobile crane	7	1%
Rigid	Skip lorry	33	5%
Rigid	Tanker	3	0%
Rigid	Tipper	64	10%
Rigid	With trailer	1	0%
Rigid (Drawbar)	N/A	2	0%
Rigid/with hiab	Dropside	3	0%
TOTAL OBSERVED		**615**	**100%**

- Articulated vehicles accounted for 252 (41%) of the observed vehicles, with rigid vehicles accounting for 358 (58%). The remaining 5 vehicles were vehicles with a tractor unit (cab) only (1%)

- Flatbeds were the most common body associated with articulated vehicles, with a total of 89 observed (41 empty and 48 loaded) This high number of flatbeds is likely to represent port related traffic, which forms an important part of freight movement in the Aberdeen area

- Considering all flatbeds (articulated and rigid), it is noted that there were 20 less loaded flatbeds travelling south over the three periods. It is likely that this accounts for the completion of deliveries to locations in Aberdeen (for example in the Harbour Area), with the unladen vehicle then returning south. This is further strengthened by comparing the total number of empty flatbeds (articulated and rigid) heading south (51) to north (33)

- Curtainsider bodies were also common across both main unit types, with a total of 38 Articulated/Curtainsider vehicles and 49 Rigid/Curtainsider vehicles

- Lorries with Box/refrigerated bodies were also common, totalling 61 for articulated vehicles and 80 for rigid vehicles

4.4.4 Home Bases of Observed Operators

Northbound

Table 4.21 – Home Bases of Observed Operators, Wellington Road (Northbound)

Operator Type	Total	%
Local	324	66%
National Scotland	116	24%
National UK	49	10%
International	3	1%
TOTAL	**492**	**100%**
Total Unknown	*154*	
TOTAL (Including Unknown)	***646***	

- The majority of operators identified were local (66%)

- It was not possible to identify the names and details of 154 operators, typically due to the absence of any cab/trailer markings or the quality of the footage of that particular vehicle
  - However, the above table shows that an assessment of base/type was able to be made for 492 of the 646 vehicles recorded (76%)

Southbound

Table 4.22 – Home Bases of Observed Operators, Wellington Road (Southbound)

Operator Type	Total	%
Local	270	74%
National Scotland	67	18%
National UK	23	6%
International	3	1%
TOTAL	**363**	**100%**
Total Unknown	*252*	
TOTAL (Including Unknown)	***615***	

- The majority of operators identified were local (74%)

- It was not possible to identify the names and details of 252 operators travelling south on Wellington Road. This number is notably higher than the northbound total of unknown operators, despite the total number of vehicles for southbound being less. As has been previously noted, the deterioration in weather conditions over the course of the survey day (which was exacerbated by south facing rain) made the identification of operator names difficult in many cases
  - Thus, an assessment of base/type was only made for 363 of the 615 vehicles recorded (59%)

4.4.5 HGV EURO Standards

Northbound

Table 4.23 – HGV EURO Standards, Wellington Road (Northbound)

EURO Standard	Total	%
Pre-EURO	0	0%
Pre-EURO/EURO I	1	0%
EURO I	4	1%
EURO I/EURO II	2	0%
EURO II	29	7%
EURO II/EURO III	4	1%
EURO III	145	36%
EURO III/EURO IV	31	8%
EURO IV	155	38%
EURO IV/EURO V	14	3%
EURO V	23	6%
TOTAL	**408**	**100%**
Total Unknown	*238*	
TOTAL (Including Unknown)	***646***	

- EURO III and EURO IV account for the majority (74%) of HGVs observed on Wellington Road

- It was not possible to determine the EURO standard of 238 vehicles. This was attributed to:
  - The observation of International registration plates, when the introduction of the relevant EURO standard in these countries was unknown;
  - The observation of personalised registration plates; and
  - Being unable to identify the registration plate due to the quality of the footage of that particular vehicle

Southbound

Table 4.24 – HGV EURO Standards, Wellington Road (Southbound)

EURO Standard	Total	%
Pre-EURO	0	0%
Pre-EURO/EURO I	0	0%
EURO I	2	1%
EURO I/EURO II	0	0%
EURO II	10	5%
EURO II/EURO III	3	2%
EURO III	83	42%
EURO III/EURO IV	10	5%
EURO IV	75	38%
EURO IV/EURO V	2	1%
EURO V	13	7%
TOTAL	**198**	**100%**
Total Unknown	*417*	
TOTAL (Including Unknown)	***615***	

- EURO III and EURO IV account for the majority (80%) of HGVs observed on Wellington Road

- It was not possible to determine the EURO standard of 417 vehicles. For the same reasons as discussed in the Operator Type section above, the identification of registration plates (and subsequent determination of EURO standard) was made difficult because of the weather conditions
  - Thus, 68% of HGV EURO Standards were unable to be determined, although previously cited factors including the presence of international/personalised registration plates will also be reflected in this number

4.4.6 Laden Vehicles & Freight Efficiency

Northbound

Table 4.25 – Laden Vehicles & Freight Efficiency, Wellington Road (Northbound)

Vehicle Laden	Total	%
With Load	184	79%
Empty	42	18%
N/A (Cab only)	7	3%
TOTAL	**233**	**100%**
Total Unknown	*413*	
TOTAL (Including Unknown)	***646***	

- 79% of the vehicles observed were confirmed as carrying a load
- Only 42 (18%) of the vehicles were confirmed as being unladen
- It was not possible to determine whether 413 of the vehicles were laden because of their nature (e.g. Curtainsider, Box/refrigerated. The level of traffic at this site may also have affected the ability to identify whether lorries in the adjacent lane were carrying loads

Considering vehicles with confirmed loads and empty vehicles in isolation:

Table 4.25a – Vehicles (With Load) and Vehicles (Empty), Wellington Road (Northbound)

Vehicle Laden	Total Vehicles	%
With Load	184	81%
Empty	42	19%
TOTAL	**226**	**100%**

  - For 81% of vehicles where an assessment of load type was able to be made, it was confirmed that the vehicle was laden

Southbound

Table 4.26 – Laden Vehicles & Freight Efficiency, Wellington Road (Southbound)

Vehicle Laden	Total	%
With Load	126	64%
Empty	65	33%
N/A (Cab only)	5	3%
TOTAL	**196**	**100%**
Total Unknown	*419*	
TOTAL (Including Unknown)	***615***	

- 64% of the vehicles observed were confirmed as carrying a load
- 65 (33%) of the vehicles were confirmed as being unladen
- It was not possible to determine whether 419 of the vehicles were laden because of their nature (e.g. Curtainsider, Box/refrigerated. The level of traffic at this site may also have affected the ability to identify loads on lorries in the adjacent lane

Considering vehicles with confirmed loads and empty vehicles in isolation:

Table 4.26a – Vehicles (With Load) and Vehicles (Empty), Wellington Road (Southbound)

Vehicle Laden	Total Vehicles	%
With Load	126	66%
Empty	65	34%
TOTAL	**191**	**100%**

- For two-thirds of vehicles where an assessment of load type was able to be made, it was confirmed that the vehicle was laden
- This is a lower total (and percentage) than was observed for vehicles travelling northbound. This may reflect the completion of **deliveries** to locations such as Altens Industrial Estate, the Aberdeen Harbour area and the City Centre, prior to the vehicle returning south unladen

4.5 Summary

The ground level video survey technique successfully captured a high percentage of the vehicles recorded by the high mast cameras at all of the survey locations and provides added value to this study.

With regard to northbound freight movement (i.e. towards Aberdeen Harbour/City Centre and the A90 North), the highest number of vehicles in each case was recorded in the morning shift between 0700 and 0930. However, the number of freight vehicles travelling towards the south of Aberdeen from Riverside Drive and Wellington Road peaked in the afternoon (during the 1130-1400 shifts). This is consistent with the findings of the high mast video analysis which concluded that this may represent the return journeys of vehicles that have completed their business in the Aberdeen area.

The ground level video survey analysis adds further weight to this conclusion in the assessment of laden and unladen vehicles, which shows that more laden vehicles were observed travelling towards Aberdeen, with a greater number of unladen (empty) vehicles confirmed on the routes travelling away from Aberdeen (i.e. towards the south).

Although at each site the majority of operators observed were confirmed as local, the total number of local operators was lowest on the Riverside Drive routes. This is consistent with earlier findings which suggested that fewer locally based vehicles may use this route given its role (for freight) as the main diversionary route connecting the A90 (North) and A90 (South).

In addition, at each location (and direction) surveyed, freight vehicle engines were clustered between the EURO III and EURO IV standards, suggesting that most of the vehicles observed are less than 10 years old, and in many cases, newer. These statistics are broadly in line with trends at the national level – the average age of HGVs licensed in Scotland stood at 5.7 years in 2007[2], although it is noted that many of the vehicles recorded as part of this survey will have been registered elsewhere in the UK.

Chapter 5 summarises the key findings of the study.

[2] *Freight in Scotland* (Scottish Government, 2009)

Key Findings

5 Key Findings

5.1 Introduction

This final chapter presents the key findings of the Aberdeen City Freight Flows Survey.

Overall, it was found that survey approach of high mast video counts supplemented by more detailed on-site, ground level video surveys provided the opportunity for detailed data capture of freight flows on Market Street, Riverside Drive and Wellington Road.

The high mast counts enabled an overall total of vehicles to be confirmed, as well as distinguishing between different types of freight vehicle. The ground level video survey then enabled more detailed information on these vehicles to be provided. It is considered that this approach is suitable to apply to any similar surveys that may be undertaken in the area in the future.

5.2 Key Finding 1 – Distinctive Patterns of Activity

The High Mast surveys revealed distinctive patterns of activity of Goods Vehicle Movements at each of the three sites.

All South to North movements (ie vehicles entering the city from the South) tended to peak between 10am and 12 noon, prior to steadily decreasing during the rest of the day.

Conversely, North to South movements (ie vehicles leaving the city towards the South) had two peaks – firstly one between 9am and 11am, and a second peak between 2pm and 4pm.

Overall, South to North movements also were higher between 0600 and 0700 than the North to South movements, and maintained a lower, but more consistent level of activity throughout the day. By contrast, North to South movements typically appeared more compressed, and more peaky, particularly in the middle of the day. The peakiness of the North to South movements may be explained by the fact that these trips may be being captured very close to their journey origin, whilst the South to North movements may be captured further from their journey origin (and from a wider variety of origins) potentially smoothing out the impacts of lunch breaks, and shift start/finish times.

5.3 Key Finding 2 – Different Levels of Activity by Location

The surveys confirm that the busiest location for freight vehicles (from the three points surveyed) was the Market Street/Virginia Street area. This will be due to the presence of the harbour generating many local delivery and pick-up trips, and the use of the route as a seemingly preferred through route for goods vehicles. At this location, there was also an apparent preference of direction for North to South movements.

Patterns of activity at Wellington Road closely matched those found at Market Street, although levels of activity were lower. Some of the local movements associated with the harbour would have dispersed into the local network prior to reaching this point in the network.

The levels of activity at Holburn Street/Riverside Drive were the lowest observed in the survey, supporting anecdotal evidence that this route is less preferred. The South to North direction (Southbound on Riverside Drive) was more popular for the largest goods vehicles, perhaps indicating a preference for use in this direction. This may be due to the two left turns required on the Riverside Drive / Holburn Street diversion, but also due to other factors on the route (such as the steep hill on the northbound approach to Haudagain Roundabout).

5.4 Key Finding 3 – Freight Efficiency

The results of the ground level surveys demonstrated the correlation between the direction of travel and whether a freight vehicle was laden or unladen (where this was able to be assessed). A greater percentage of freight vehicles travelling towards Aberdeen were found to be laden, while the number of empty vehicles was higher for southbound traffic travelling away from Aberdeen.

There may be an opportunity to increase freight efficiency on some of these returning unladen vehicles (for example by encouraging back loading), although the extent to which this would be possible is difficult to determine as some of these vehicles may have had further collection points, thus necessitating the towing of an empty trailer.

5.5 Key Finding 4 – Mix of Different Traffic Types

The observations point to a mix of different traffic types at the different locations. Market Street/Virginia Street had the highest proportion of local freight operators (78%), due to local hauliers serving the harbour. This is supported by this site also registering the highest proportion of Flat Bed articulated lorries, typically used for general offshore related haulage, at 25% (at the two other locations this was 15%-16%).

At Wellington Road, the proportion of local traffic was 66%-74%, whist at Riverside Drive it was much lower at 60%-62%.

5.6 Key Finding 5 – Engine Standard

Analysis of registration plates demonstrate that there are very few Euro 0, Euro I or Euro II vehicles using the local network in Aberdeen, typically around 10% of the total. There is a much larger proportion of Euro III lorries in the fleet, at around 40%.

The boundary between the Euro III and Euro IV powered lorries appears to mark a “tipping point” in the fleet, as slightly greater than 40% of the lorries are Euro IV, with the remainder being Euro V. This pattern is broadly consistent across the three locations surveyed.

5.7 Summary

The work that has been undertaken provides a resource for further analysis and interrogation, which can be tailored to suit the requirements of the particular projects. Ground level photos and video footage is retained to facilitate this, with data held within a spreadsheet format.

Consideration may be given to undertaking similar surveys at other strategic locations on the region’s freight network, such as the A90(N) and the A96, along with city centre surveys at Auchmill Road / Powis Terrace and on King Street.

Appendices

Capabilities on project:
Transportation

Appendix A – OGV Classification

Table 2.1 Commercial Vehicle Classes and Categories

Commercial vehicle (cv)	cv class*	cv category
	2-axle rigid	OGV1
	3-axle rigid	
	3-axle articulated	OGV2
	4-axle rigid	
	4-axle articulated	
	5-axle articulated	
	6 (or more) -axle articulated	

* Classed by axles in contact with the road
PSV = Public Service Vehicle
OGV = Other Goods Vehicle

Capabilities on project:
Transportation

Appendix B – Survey Locations

Capabilities on project:
Transportation