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Insights from the Sydney Commercial Vehicle Video Study

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Abstract

Historically, there has been little information available that documents the road freight task by vehicle type and purpose. Existing data sources are either too focused or else too coarse in their geographic coverage, do not describe vehicle type or purpose, possessed by private industry and unavailable for general use, or else are now quite dated.

During 2014, a large, comprehensive dataset describing the Sydney metropolitan road freight fleet in context with the passenger task was collected using high quality image capture across a 24-hour period and detailed analysis of the collected images. The dataset allows for a detailed understanding of the current road freight task, by location, by time of day and by purpose to be developed.

The data was collected in a manner that allowed it to be combined with a similar dataset collected for Melbourne. This super-set of data now allows for similarities and comparisons between the road freight task in Sydney and Melbourne to be made.

Combined the data provides evidence to confirm understandings, and refute myths about freight traffic and its interaction with passenger traffic. This paper will discuss details regarding the study methodology, and highlight key findings from the analysis including examination of the actual impact of freight vehicles on congestion. Key questions to be examined include: are trucks truly choking the road network, delaying commuters from getting to work or home on time, and exactly how many trucks are out there?

1. Introduction

An efficient road freight network is essential to the NSW economy. Freight is of particular importance in the Australian context given the geographic size of the country and the dispersed nature of population and major industry production centres. Yet there is only limited information describing the road freight task. Of the existing data sources there are inherent weaknesses that cannot be easily overcome.

1.1 National Freight Movements Survey

The Australian Bureau of Statistics published the Freight Movements Survey (FMS) in 2002. The FMS documents the movement of freight by commodity in tonne-kilometre, by mode and by state. Key issues with the data include:

- Whilst the data is disaggregated into a number of commodity groupings, there is no means for reorganisation of the commodity groups,
- The use of tonne-kilometres as the unit of measurement make understanding the size of the task reliant on assumptions or secondary sources of information regarding average distance travelled and vice versa,
- The dataset is only presented at regional (Statistical Subdivision) level at its most disaggregate, thus providing no detailed information on the geographical context of the freight task,
- The survey does not provide detail on the vehicle type and configurations used in the transportation of freight, and
- The underlying survey work was undertaken between 2000 and 2001, making the dataset now quite dated. Although, it is noted that the results of a new survey are due this year.

1.2 Weigh in Motion Data

Weigh-in-motion (WIM) data has been shown to be able to provide useful insight regarding the quantification of heavy commercial vehicles by location, for selected vehicle types and gross tonnage. However, it is difficult to site WIM equipment in metropolitan areas and hence sites with high rather than representative heavy commercial vehicle (HCV) volumes are targeted, limiting the use of WIM data in explaining the urban road freight task. Further, data from WIM technology can become unreliable over time unless sensors are regularly monitored and re-calibrated. Finally, WIM data provides no insight into trip purpose (transporting freight or to provide a service) nor to the commodity type being transported in the case of freight trips.

1.2 Traditional Traffic Surveys

More traditional traffic surveys provide information on vehicle type used, with many such surveys classifying vehicles using the Austroads vehicle classification system. However, whilst these surveys can provide more contemporaneous data on traffic volumes, they have the following limitations:

- They provide no information regarding the use of the vehicle (transporting freight or to provide a service),
- They provide no information regarding the commodity being carried on the vehicle,
- To reduce costs they are typically limited to a 13-hour daytime or 4-hour peak time period, particularly troublesome given freight vehicles tends to avoid travel during peak periods, and
- Such surveys are typically conducted for one-off studies or projects, with data ownership usually retained by the organisation undertaking the study or project. Gaining knowledge of and access to such datasets can potentially require formal negotiation and agreement between parties.

1.3 The Sydney Commercial Vehicle Video Study

To improve the performance of the network and create a better understanding of how it is being utilised, the first quantification of the Sydney metropolitan road freight task was undertaken during 2014:

- By vehicle and commodity
- In context of the passenger task (car, bus and taxi)

Combined, the dataset would provide a comprehensive understanding of task diversity, by geographic location and time of day. This would in turn provide evidence to confirm understanding and refute common misconceptions regarding the freight task, as well as enable the analysis required to target investment to improve urban freight productivity.

2. Data Collection

Data for the study was acquired using normal and infra-red video of vehicles passing selected sites on major roads within Sydney. Video was recorded of both directions of travel for a 24 hour period (midnight to midnight). This video was then examined for three one-hour periods across the day, and still-images of the first 100 HCVs to pass were captured and stored. This limit of 100 images was implemented to control costs.

The images were then individually assessed in order to determine specific vehicle type, and establish a likely commodity carried either through direct observation of the load itself, or through deduction based on image context, for example branding on the vehicle. Observed vehicle numbers were then scaled up in order to expand the 100 HCVs observed to the full one-hour period being analysed. The timing and labelling of these periods are as follows:

- AM-Peak (7:30am-8:30am);
- Day Off-Peak (11:30am-12:30pm); and
- PM-Peak (4:00pm-5:00pm).

This process broadly matches that used in a similar study undertaken in Melbourne, and thus permit a super-set of data to be analysed for similarities and comparisons between the two cities.

The remainder of this section details the data collection process undertaken for the Sydney study.

2.1 Choice of Location

The sites chosen for the survey were selected based on a range of criteria:

- The road was a major arterial route or motorway within Sydney, with high traffic volumes
- The road served as a primary corridor for freight vehicles accessing nearby commercial / industrial centres
- The specific site was along a NSW Roads and Maritime Services screenline where no information on heavy vehicle flows was previously available, allowing for the data to also be used for the dual purpose of strategic traffic model calibration/validation
- The survey company undertaking the fieldwork (the field team) could safely and readily set-up, monitor, service and finally remove field equipment (with the aid of traffic management as needed)

To fit budgetary and timing constraints, 40 sites were selected for the survey based on the above criteria. **Figure 1** shows the position of these sites across Sydney. Of the 40 sites, fourteen were on motorways, with the remainder on arterial roads. A full list of site locations appears as **Appendix A**.

2.2 Pilot Survey

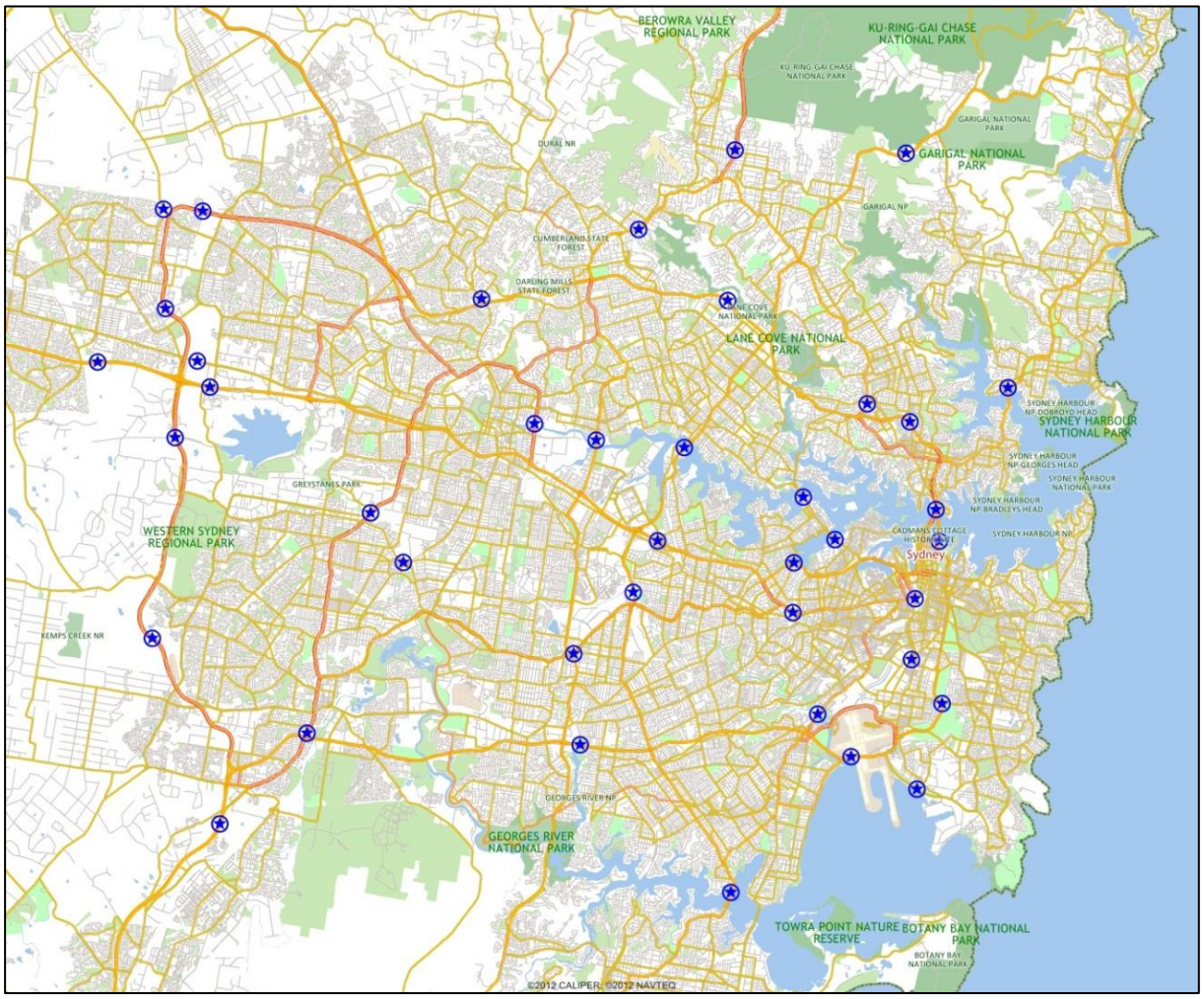
A pilot survey was undertaken prior to the main survey. The site selected for the pilot study was Pennant Hills Road as the field team had access to the survey site without a need for traffic management.

The pilot highlighted key issues which proved invaluable during the main survey:

- Confirmed that existing equipment held by the field team was of sufficient quality to undertake the survey with image quality at night sufficient to complete the image capture and analysis
- Confirmed practical battery life of field equipment such that the field team had no issues recording a full 24 hours of video for all sites during the main survey
- Camera angle relative to the sun needed to be correctly accounted for across the entire day to ensure glare and / or shadow did not impair image capture at any point

The pilot also raised the issue of data storage and transfer. The use of multiple cameras to provide complete coverage of vehicles indeterminate of angle of sun or size of vehicle, combined with the 24 hour duration of the survey generated large file sizes not easily transferred (by email).

Figure 1: Surveyed Sites



2.3 Main Survey and Image Capture

Due to equipment limitation, the main survey was staggered over the course of several weeks during May and June 2014 (2-3 sites surveyed per day). Surveys were further confined to a Tuesday, Wednesday or Thursday to avoid interference from weekend travel patterns that can typically impact Monday mornings and Friday evenings.

The approximately 24,000 images collected (40 sites x 2 directions x 3 one-hour periods x 100 images) were then individually assessed to extract vehicle class and subclass, vehicle type, industry type, commodity transported (or service undertaken) and the business name. **Figure 2** and the associated **Table 1** below show an example image collected from the survey and the data extracted from the image.

Figure 2: Example Image capture

Table 1: Example Data Extraction from captured images

Level	Value recorded
1. Class	HCV
2. Subclass	Rigid
3. Industry type	Freight
4. Vehicle type	Cement mixer
5. Commodity	Building materials – Cement
6. Business name	Boral

During the HCV image assessment process, daily validation checks were undertaken to ensure that images were being assessed and data extracted accurately, and in a consistent manner. Examples of commodity categories used include 'Building Materials', 'Waste and recycling', 'Food and beverages', 'Manufactured goods', and 'Fuel and other liquids'. Examples of services include: 'Construction', 'Towing and repairs', 'Commercial services', 'Home services', 'Hire equipment', and 'Community services'. For brevity, a full list of categories for the various levels of data extracted cannot be included.

The data extracted were then combined and finally compiled into a single database for analysis.

2.3.1 Methodological Limitations

Determination of commodity transported or service provided was based solely on the image captured. This raises the issue that it is impossible to determine the number of laden versus unladen trips. For example, from the image above in Figure 2 it is impossible to know whether the truck actually was transporting cement to a site, or whether it was instead returning to a batching plant, or bound for another destination entirely. Such information could only be determined through some other means such as determining the weight of the passing vehicle.

Further, in some cases it was impossible to ascertain the commodity being transported. Box trucks and curtainsiders, where no business markings were observed that could provide further information, were grouped into 'Commodity unknown – palletised general freight', whilst Container trucks were grouped into 'Commodity unknown – container freight'.

Finally, due to the style of the survey, combined with the allocation of equipment during fieldwork with sites in similar geographic areas typically surveyed on the same day, it is possible that some amount of double counting may have taken place, with a single HCV being recorded at multiple sites.

The limitations noted above should be kept in mind with regards to the summary analysis presented in the remainder of this paper.

3. Data Analysis

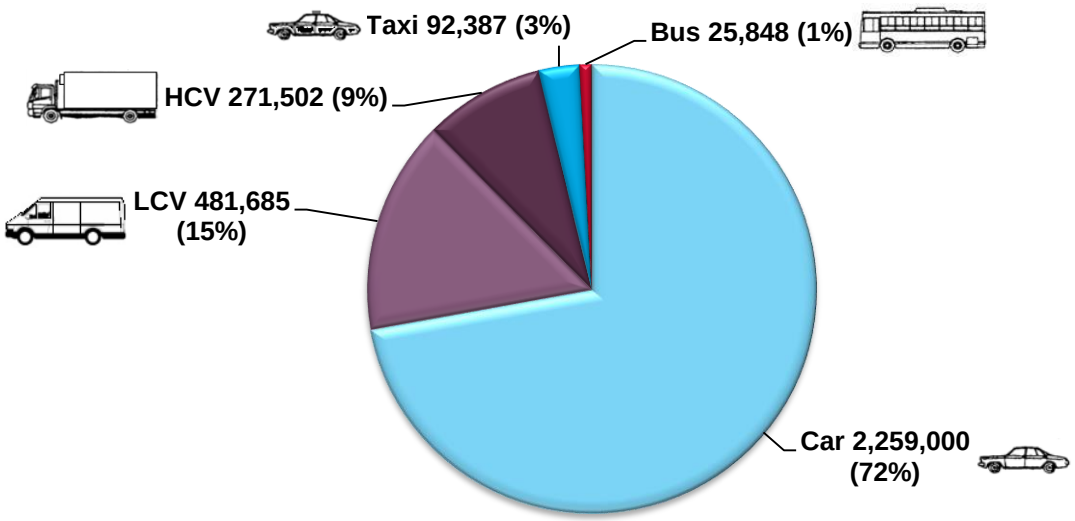
The database was queried in order to examine a number of issues. Key findings from this analysis are discussed in the remainder of this section.

3.1 Vehicle Class

The survey observed a total of 3,130,422 vehicles across all 40 sites, for the 24 hours each site was surveyed. **Figure 3** shows that a total of 2,259,000 (72%) vehicles were identified as private cars, with the remaining 871,422 (28%) as commercial vehicles. Of the latter, the vast majority were determined to being either a light commercial vehicle (LCV) or heavy commercial vehicle. For the study, HCVs were defined as any vehicle of Austroads classification greater than 4, whilst other vehicles which were observed to have business markings were categorised as LCVs.

- 481,685 LCVs
- 271,502 HCVs

Figure 3: All vehicles by class



3.1.1 Vehicle Class by location

Vehicle class changed significantly depending upon location. However, it is infeasible to provide details and appropriate commentary for all forty sites surveyed in this paper. Instead, for illustrative purposes, three sites have been chosen representing areas of potential interest, and detailed analysis summarised throughout the remainder of this paper. The three sites selected are:

- M4 Motorway, Eastern Creek – the spine of the Sydney road network,
- George Street, Haymarket – a gateway to the Sydney CBD, and
- Foreshore Road, Botany – near to Port Botany.

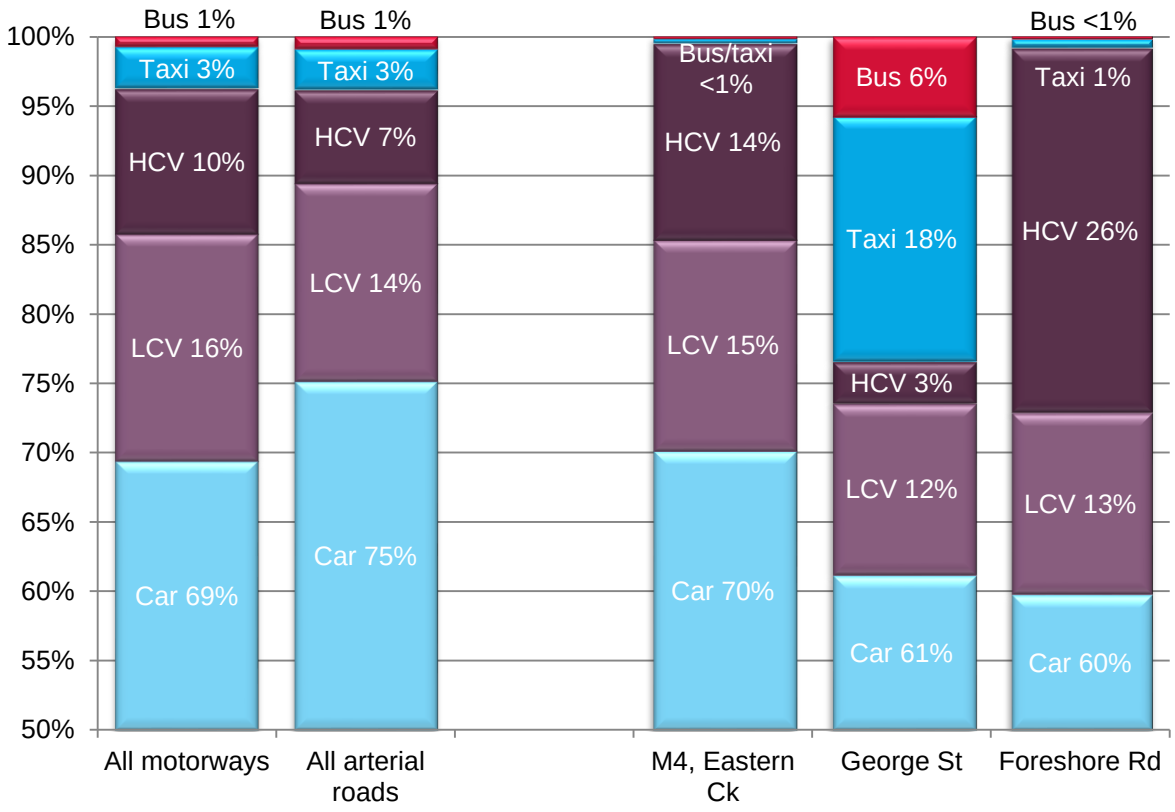
Figure 4 shows the vehicle class breakdown for all motorways and all arterials. The Figure shows that LCV and HCV proportions are generally higher on motorways. This could imply that HCVs are making efficient use of the motorway network to complete their journey, with the motorways generally providing a faster journey compared to the arterial road network. Alternatively, it could simply recognise that some HCVs operate with access limitations on local roads.

The Figure also shows that there is a great deal of variability across Sydney. In line with expectations:

- the M4 Motorway follows the broad motorway trend, whilst

- George Street was observed to have only a very low proportion of HCVs (3%) due to the constrained road network limiting the size of vehicle that can access the CBD, and
- Foreshore Road had a much higher volume (26%) due in part to Port Botany related trips.
- Taxi and Bus proportions were observed to be quite high (24%) on George Street, whilst the other two sites had very low proportions (less than 1%).

Figure 4: All vehicles by class and by location



3.2 Daily Profile

Figure 5 and **Figure 6** show the aggregated daily profile for all motorways and all arterial roads surveyed. The Figures show that across the sites surveyed the AM peak for cars is observed to be around 8:00am and the PM peak around 5:30pm. An afternoon 'school peak' is observed on the shoulder of the PM peak. The timing of the peaks is consistent for both motorways and arterial roads, although motorways carried, on average, more traffic.

Both peaks for LCVs are observed to occur earlier, around 6:30am in the morning, and around 3:30pm in the afternoon. This is consistent with expectation with most service travel usually starting / finishing earlier to avoid congested times of travel.

For clarity, **Figure 7** shows the daily profile for heavy commercial vehicles only. The AM Peak is seen to match that for LCVs, that is, approximately 6:30am. Interestingly, there is an observed dip in HCVs between 6:30am and 9:30am as HCVs attempt to avoid congested AM peak conditions on the road instead frequently using the time to load/unload. The Figure also shows that after the Car AM peak, HCV volumes increase to the daily peak at around midday before falling away. No PM peak is observed for HCVs.

Figure 5: Daily profile, All vehicles - Motorways

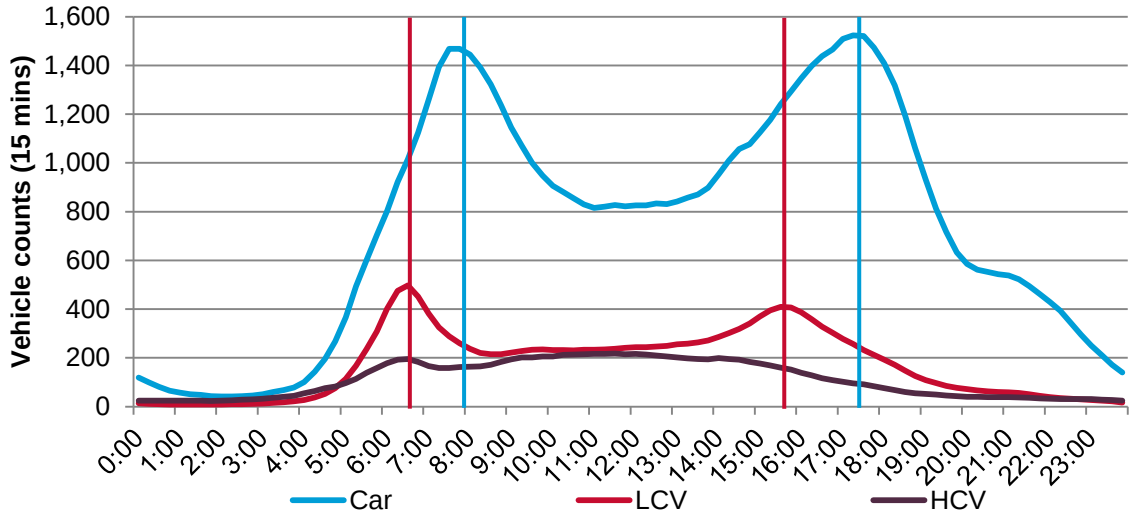


Figure 6: Daily profile, All vehicles – Arterial Roads

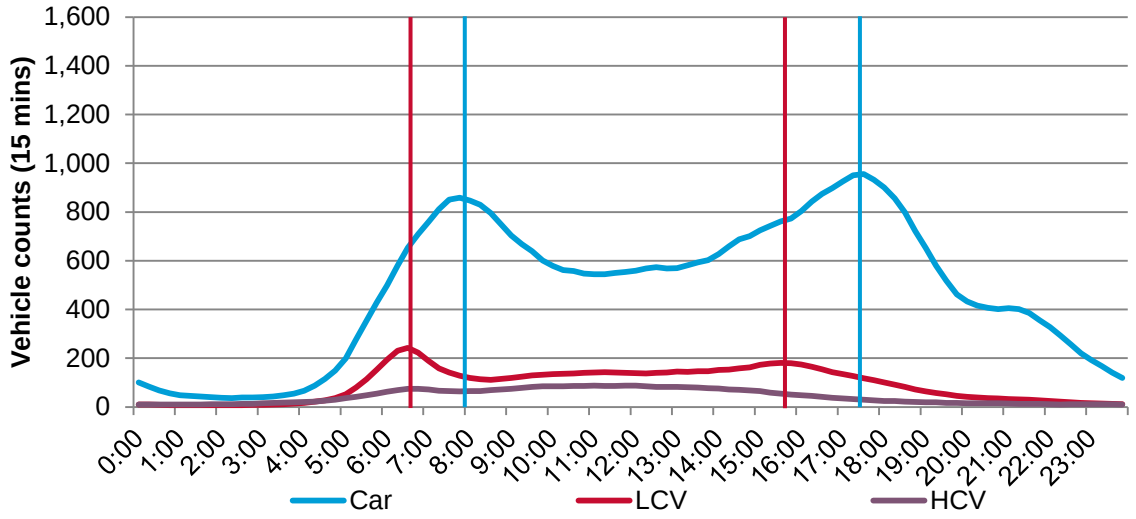
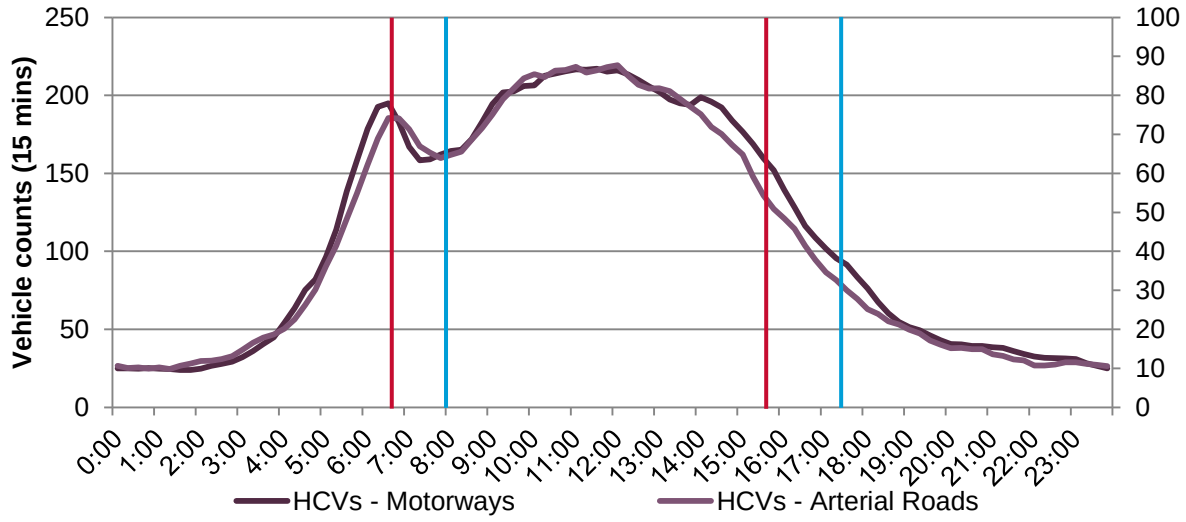


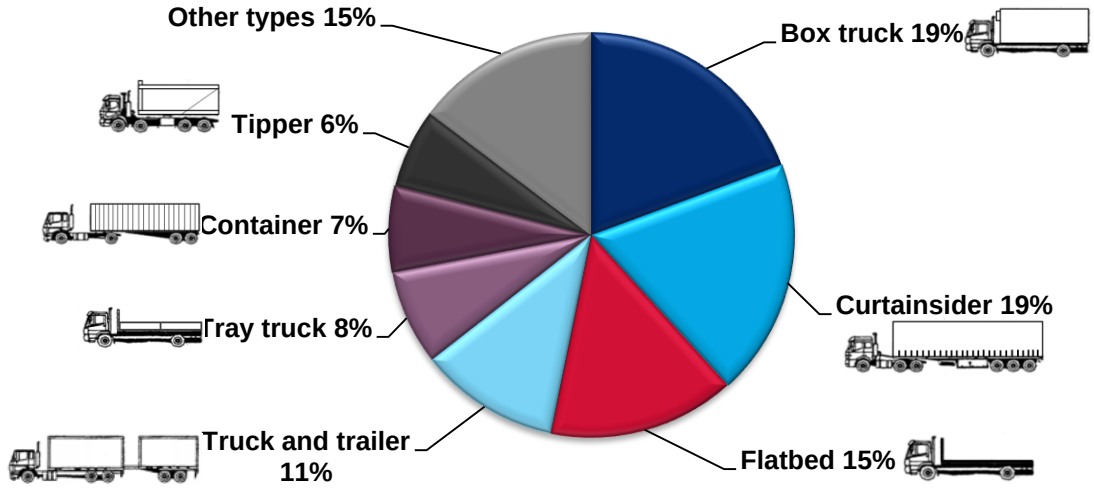
Figure 7: Daily profile, Heavy Commercial Vehicles



3.3 Heavy Commercial Vehicle Breakdown

Heavy commercial vehicles were further categorised by explicit vehicle type. **Figure 8** shows the breakdown of heavy commercial vehicles, by vehicle type, Sydney wide. The figure shows that the top five vehicle types make up more than 70% of all observed heavy commercial vehicles. Further, assuming a common loaded vs unloaded ratio for surveyed, almost 40% of all freight in Sydney is delivered in box trucks and curtainsiders, whilst containerised freight comprises only 7% overall (note Skell trailers comprise only 1% and have been included in Other types).

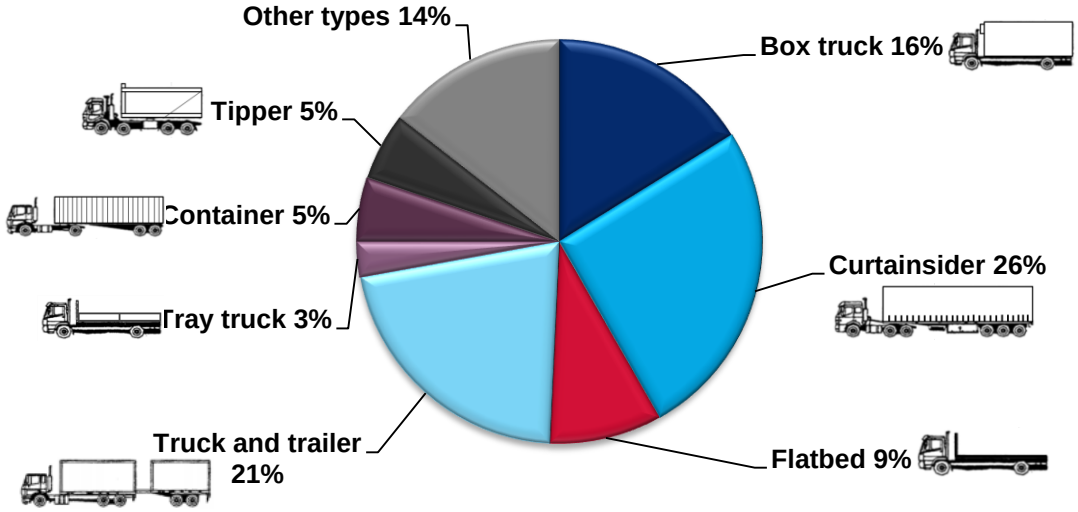
Figure 8: Heavy Commercial Vehicle type breakdown, Sydney wide



3.3.1 Heavy Commercial Vehicle Class by Location

Figure 9, Figure 10 and **Figure 11** show the breakdown for the three selected sites and demonstrate that there is considerable variation in vehicle type across Sydney.

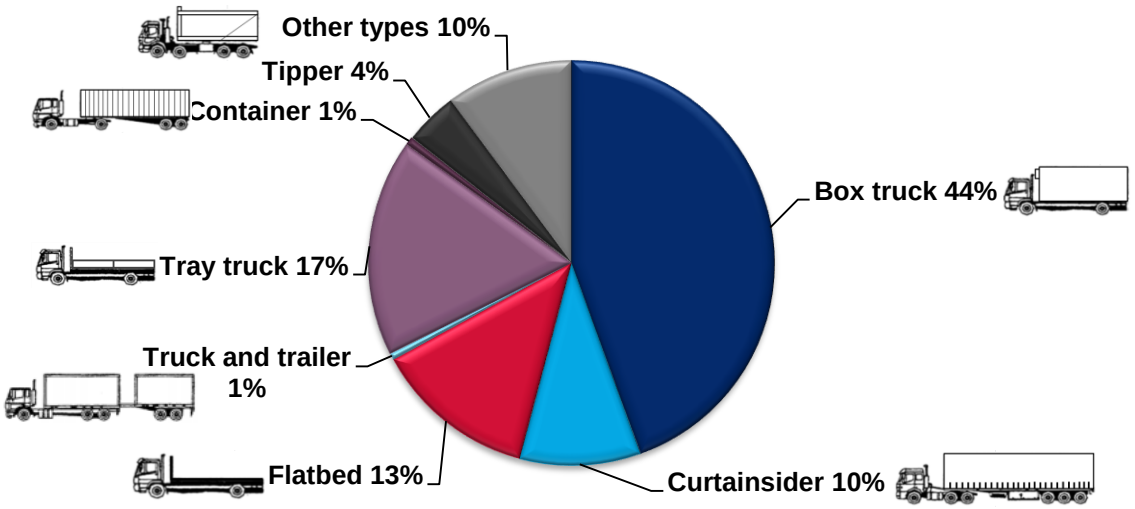
Figure 9: Heavy Commercial Vehicle type breakdown, M4 Motorway, Eastern Creek



The M4 Motorway was observed to have a much higher number of truck and trailers (21%) and curtainsiders (26%) than the average, likely a result of the generally more open nature of the road network more easily catering for larger style vehicles, whilst George Street had almost no truck and trailers (4%), nor container trucks (1%). Instead, a very high proportion

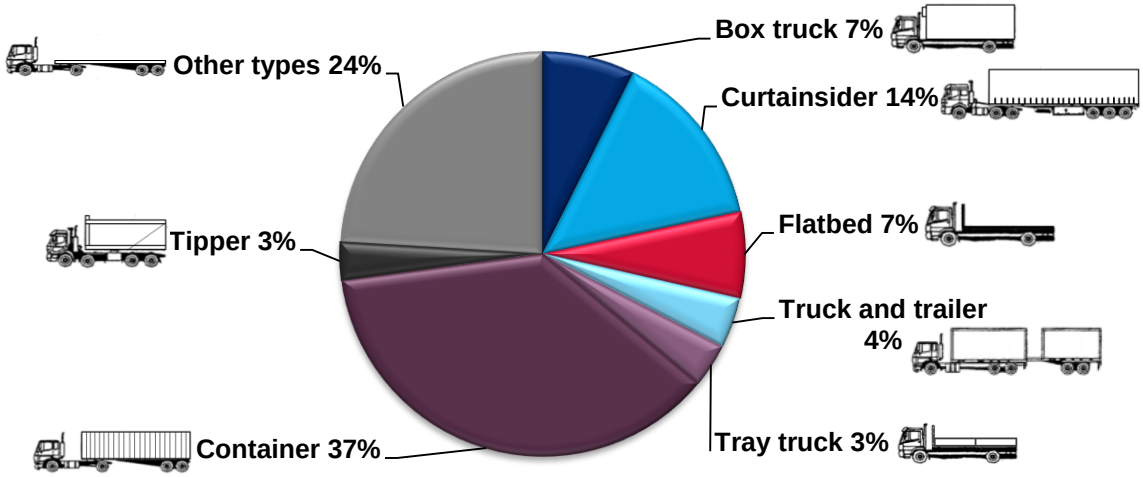
of box trucks (44%) and tray trucks (17%) were observed, more than twice that of the average. Given the constricted road network, this is not entirely unexpected.

Figure 10: Heavy Commercial Vehicle type breakdown, George Street, Haymarket



Also matching expectation, Foreshore Road was observed to have very high proportion of container trucks (37%), as well as trucks of 'other types' (24%). The latter being where skel trailers (container trucks with no container) were recorded.

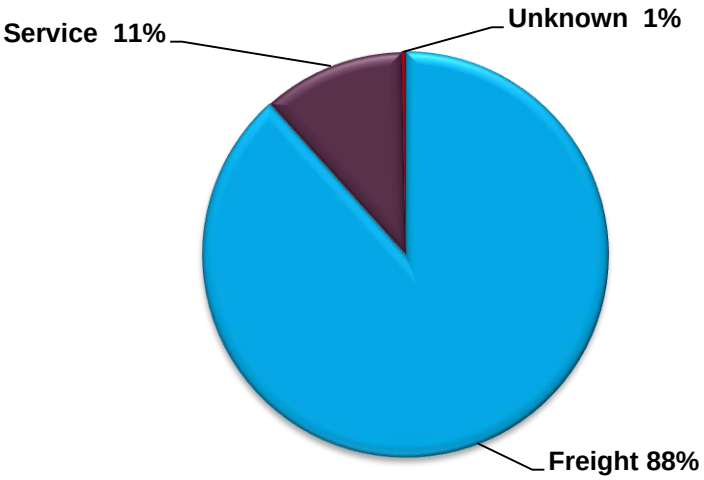
Figure 11: Heavy Commercial Vehicle type breakdown, Foreshore Road, Botany



3.4 Industry Breakdown for HCVs

Heavy commercial vehicles were also categorised by the industry in which they were used: to transport Freight, to provide a Service, or else Unknown. **Figure 12** shows the split between Freight trips (HCVs carrying goods) compared with Service trips (HCVs identified as hire equipment, removalists, trades etc). Nearly 90% of all heavy commercial vehicles observed were used to transport freight. Only 1% could not be identified as either moving freight or providing a service, demonstrating the strength of the survey methodology used.

Figure 12: Heavy Commercial Vehicle Freight or Service, Sydney wide

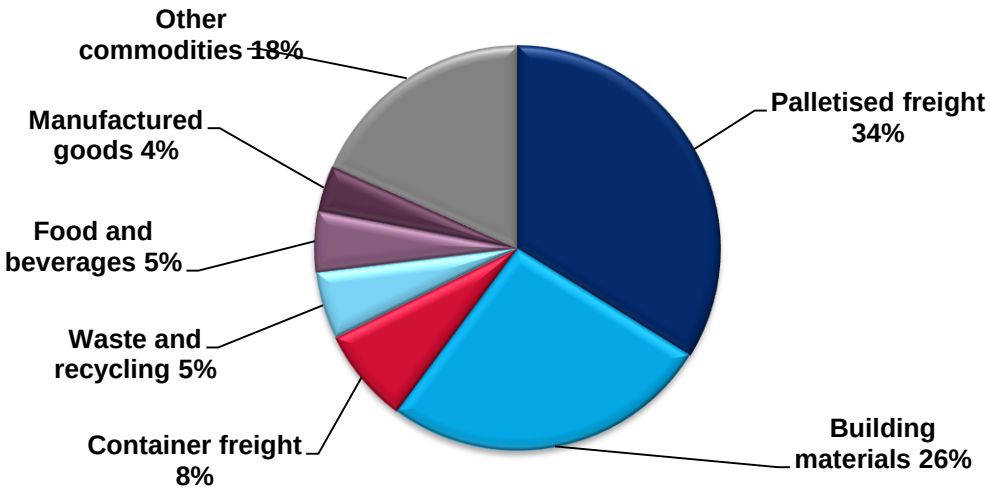


3.5 Commodity Breakdown for HCVs

Heavy commercial vehicles identified as transporting freight were further categorised based on the commodity carried. Examples of commodity categories used include 'Palletised freight', 'Building materials', 'Waste and recycling', 'Food and beverages', 'Manufactured goods', and 'Fuel and other liquids'

Figure 13 shows the commodity breakdown across all HCVs for all sites surveyed. The Figure shows that the most common freight good transported is palletised freight, followed by building materials. Together, the two commodities compose 60% of all freight observed. The figure also shows that there is a considerable range of commodities being transported, with a sizable (18%) of 'other commodities'.

Figure 13: Heavy Commercial Vehicle Commodity Breakdown, Sydney wide

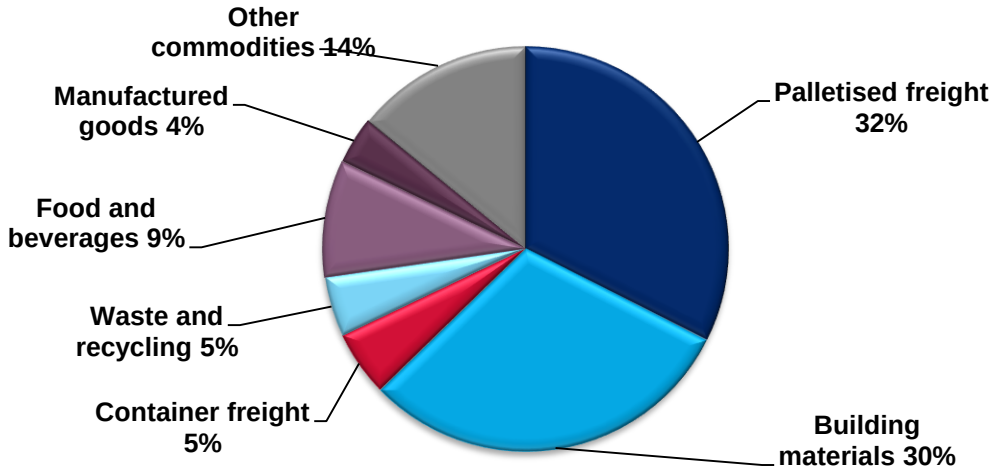


3.5.1 Commodity Breakdown for HCVs by Location

Figure 13, Figure 14 and **Figure 15** show the commodity breakdown for the three selected sites. The figures again show there is considerable variation between locations.

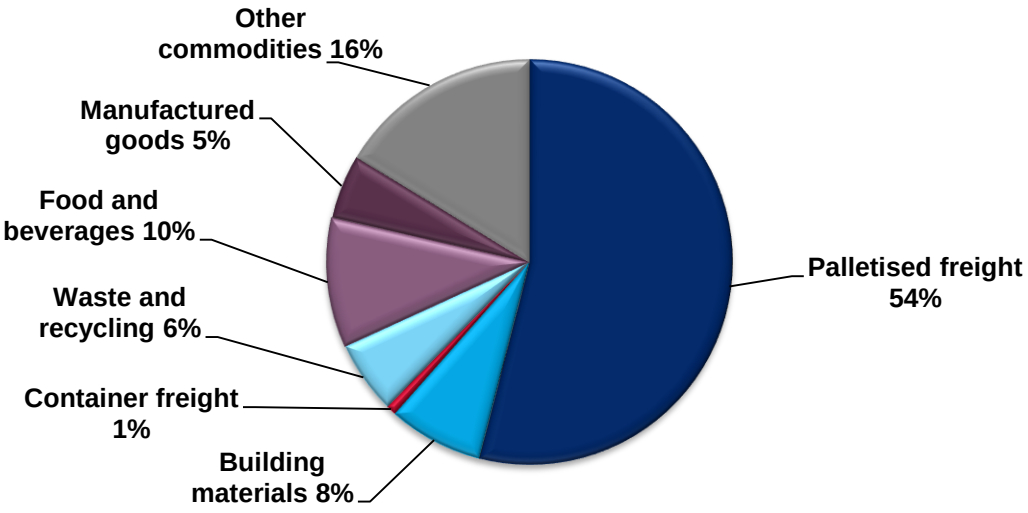
The M4 Motorway was observed to have a higher proportion of Building materials (30%) and Food and beverages (9%), but otherwise be fairly consistent with the average across all sites.

Figure 14: Commodity Breakdown, M4 Motorway, Eastern Creek



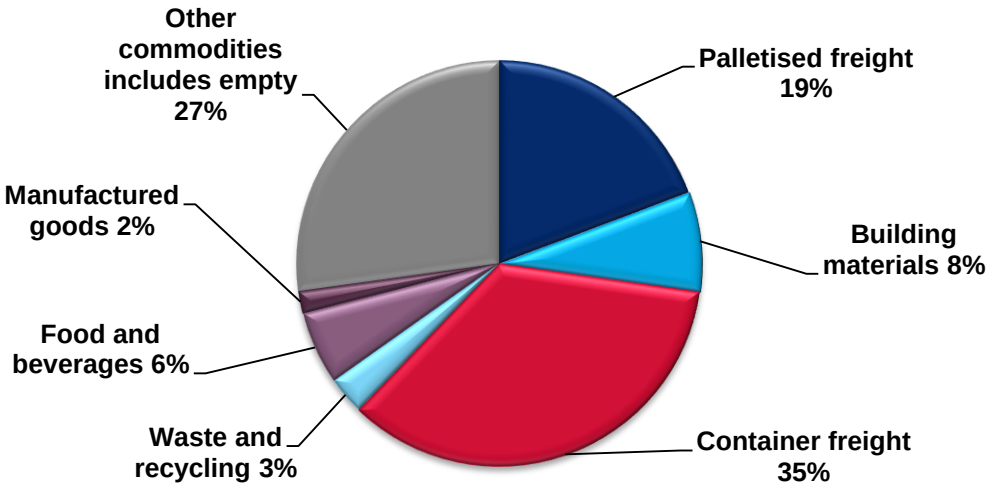
George Street was observed to have a considerable number of trips devoted to the movement of Palletised freight (54%), with much lower proportion of trips moving Building materials (8%) and Container freight (1%). A higher proportion of Food and beverage trips (10%) was also observed.

Figure 15: Commodity Breakdown, George Street, Haymarket



Foreshore Road was observed to have much higher proportion of Container freight (35%) and 'other commodities' trips (27%), with the latter also including the movement of empty skel trailers. Interestingly, Container freight accounted for only 35% of all HCVs on Foreshore Road. Given the site's proximity to Port Botany, it is likely that this value represents a 'peak' for container movements across the Sydney basin.

Figure 16: Commodity Breakdown, Foreshore Road, Botany



3.6 Comparison with Melbourne

The data collected from the Sydney survey was compared with a similar dataset for Melbourne collected in 2011. The methodologies adopted for both studies did include some differences, but enough similarities exist to enable a comparison between the two cities.

3.6.1 Vehicle Class

The Melbourne survey only covered 22 sites compared to 40 sites for Sydney, and only covered a 13 hour period and not a full 24 hours. **Table 2** below shows the results of the comparison and generally shows that there is a reasonable match between the two cities, with Melbourne observed to have slightly higher proportion of Cars.

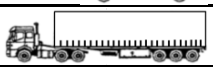
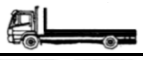
Table 2: All Vehicles by Class – Sydney compared to Melbourne

Class	Sydney (24hrs)		Sydney (13hrs)		Melbourne (13hrs)	
	Count	Percentage			Count	Percentage
Car	2,259,000	72%	1,266,854	70%	382,382	76%
LCV	481,685	15%	40,226	17%	71,479	14%
HCV	271,502	9%	16,239	10%	37,074	7%
Taxi	92,387	3%	298,616	2%	8,686	2%
Bus	25,848	1%	179,388	1%	2,216	0%
Total	**3,130,422**	**100%**	**1,801,323**	**100%**	**501,837**	**100%**

3.6.2 Heavy Commercial Vehicle Breakdown

Table 3 below shows the comparison of vehicle types between Sydney and Melbourne. Broadly, some consistency can be seen between the two cities. However there are some differences of note. The sites surveyed in Melbourne were observed to have twice as many Flatbed trucks compared to the sites in Sydney however this might be partly explained by Tray Trucks in the Melbourne study being recorded as Flatbed trucks. The other big difference observed is the much higher use of Truck and trailers in Sydney than in Melbourne.

Table 3: HCV vehicle type breakdown – Sydney compared to Melbourne

Vehicle type	Sydney	Melbourne
Box truck 	19%	18%
Curtainsider 	19%	22%
Flatbed 	15%	30%
Truck and trailer 	11%	1%
Tray truck 	8%	0%
Container 	7%	10%
Tipper 	6%	9%
Other types	15%	10%

3.6.3 Industry Breakdown for HCVs

Table 4 below shows the breakdown in industry type for both Sydney and Melbourne. The table shows that there is a lot of similarity between the two with Sydney having slightly higher (88%) of vehicles involved in the transportation of freight compared to Melbourne (85%). Further, the proportion of unknown trips is lower for Sydney.

Table 4: Industry breakdown – Sydney compared to Melbourne

	Sydney		Melbourne	
Industry type	Count	Percentage	Count	Percentage
Freight	44,949	88%	31,651	85%
Service	5,761	11%	5,016	14%
Unknown	158	0%	406	1%
Total	**50,867**	**100%**	**37,074**	**100%**

3.6.4 Commodity breakdown for HCVs

Due to the differences in the collection methodology and classification groupings used, it is not possible to directly compare commodity breakdown for Sydney and Melbourne. However, some key observations are noted below:

- 'Palletised freight' and 'Container freight' – In Sydney, these two commodities made up 41% of all freight vehicles observed. The equivalent commodity group for Melbourne 'General freight' which made up 45% of freight vehicles. In both cases, this was the largest category observed.
- 'Building materials' – In Sydney, this was the next highest commodity observed (26%). In Melbourne, a much lower proportion was observed (14%), with the Melbourne grouping inclusive of Garden supplies.
- There was general consistency amongst the remainder of commodities.

4. Insights and Conclusions

During 2014, a large, comprehensive dataset describing the Sydney metropolitan road freight fleet in context with the passenger task was collected using high quality image capture across a 24-hour period and detailed analysis of the collected images. The dataset allowed for a detailed understanding of the current road freight task, by location, by time of day and by purpose to be developed.

This paper has shown that

- HCVs comprise 9% of overall traffic with LCVs another 14%. Private cars made up 72%, with the remainder either buses or taxis. Importantly, a better understanding of the range of freight moved shows the importance of the freight task to the economy is greater than its importance as a contributor to traffic congestion.
- Commercial vehicles already avoid peak periods of travel wherever possible. During the AM period, the peak for commercial vehicles (6:30am) was observed to be 1.5 hours earlier than the private car peak (8:00am). During the PM period, a similar observation was observed with the private car peak of 5:30pm, and a LCV PM peak of 3:30pm. Interestingly, HCVs were observed to dip immediately after the AM peak, before steadily rising after the private car AM peak to a daily peak around 12:00pm. No PM peak was observed for HCVs
- The overwhelming majority of heavy commercial vehicles on the road are transporting freight (88%) rather than providing a service, with the top three vehicle types Box trucks, Curtainsiders and Flatbed trucks account for more than half of all heavy commercial vehicles observed (53%).

The data was collected in a manner that allowed it to be combined with a similar dataset collected for Melbourne. The comparison showed that there is broad consistency between the two cities, with some notable differences particularly amongst vehicle types observed. Melbourne sites were observed to have twice as many Flatbed trucks compared to Sydney sites, whilst there was generally a much higher use of Truck and trailers in Sydney than in Melbourne.

Data from the study is being applied by Transport for NSW to both correct a significant under-estimation of Sydney freight task size (and hence its value) as well as to refute the myth of port container traffic choking motorways. The study shows only 3% of vehicles on a typical motorway carry containers.

Further, going forward, the dataset will be used to identify network hotpots where congestion impacts freight, allowing for targeted intervention, to apply measures to encourage off peak freight where they will produce greatest benefit and to improve urban freight forecasting and scenario analysis for both infrastructure business cases and for policy measure development.

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Appendix A – Survey sites

Site	Road Name	Road Type	Collection Date
1	F5 Fwy, Glenfield - s of Campbelltown Rd	Motorway	Thu 8-May-2014
2	M4 Mwy, Eastern Creekk - e of Light Horse Interchange	Motorway	Tue 6-May-2014
3	M4 Mwy, North Strathfield - e of Homebush Bay Rd	Motorway	Tue 13-May-2014
4	M7 Motorway, Horsley Park - at Water Supply Pipe	Motorway	Tue 27-May-2014
5	Pennant Hills Rd, Pennant Hills - at Railway Br	Non-motorway	Tue 6-May-2014
6	Hume Hwy, Casula - n of South Western Fwy	Non-motorway	Thu 8-May-2014
7	M5 Mwy, Punchbowl - e of Fairford Rd	Motorway	Tue 20-May-2014
8	George St, Haymarket - e of Harris St	Non-motorway	Thu 22-May-2014
9	Gore Hill Fwy, Willoughby - N of Northcote St	Motorway	Thu 15-May-2014
10	M7 Mwy, Quakers Hill - W of Quakers Hill Rd	Motorway	Tue 27-May-2014
11	Smithfield Rd, Smithfield - N of Robert St	Non-motorway	Thu 8-May-2014
12	Hume Hwy, Greenacre - N of Stacey St	Non-motorway	Thu 8-May-2014
13	Centenary Dr, Strathfield - N of Hume Hwy	Non-motorway	Tue 13-May-2014
14	Mona Vale Rd, Terry Hills - W of Forest Way	Non-motorway	Thu 22-May-2014
15	Victoria Rd, Drummoyne - at Gladesville Br	Non-motorway	Thu 15-May-2014
16	M2 Mwy, Epping - at Toll Plaza	Motorway	Thu 29-May-2014
17	Windsor Rd, Baulkham Hills - N of M2 Mwy	Non-motorway	Tue 6-May-2014
18	Great Western Hwy, Eastern Creek - at Eastern Ck Bridge	Non-motorway	Tue 6-May-2014
19	General Holmes Dr, Botany - e of M5 east merge	Motorway	Thu 15-May-2014
20	Foreshore Rd, Botany - 2.1km e of General Holmes Dr	Non-motorway	Thu 15-May-2014
21	Parramatta Rd, Leichhardt at Goods Railway Line	Non-motorway	Tue 17-Jun-2014
22	Sydney Harbour Bridge, Port Jackson	Motorway	Tue 13-May-2014
23	Princes Hwy, Tempe - at Cooks River Bridge	Non-motorway	Thu 12-Jun-2014
24	James Ruse Dr, Camellia - N of River Rd W	Non-motorway	Thu 19-Jun-2014
25	Silverwater Rd, Silverwater - at Silverwater Br	Non-motorway	Thu 19-Jun-2014
26	Sydney Harbour Tunnel, Sydney - N of Cahill Expressway	Motorway	Wed 11-Jun-2014
27	Dobroyd Pde, Haberfield - W of Boomerang St	Non-motorway	Thu 5-Jun-2014
28	Spit Rd, The Spit - At Spit Bridge	Non-motorway	Thu 5-Jun-2014
29	F3, Wahroonga - at Edgeworth David Ave overpass	Motorway	Thu 29-May-2014
30	Southern Cross Dr, Eastlakes - at Gardeners Rd overpass	Motorway	Wed 11-Jun-2014
31	The Horsley Dr, Fairfield - at Fairfield railway line	Non-motorway	Tue 3-Jun-2014
32	M4 Mwy, St Clair - w of Erskine Park Rd ramps	Motorway	Tue 3-Jun-2014
33	Victoria Rd, Rozelle - At Iron Cove Bridge	Non-motorway	Thu 5-Jun-2014
34	Richmond Rd, Colebee - N of Rooty Hill Rd Nth	Non-motorway	Tue 3-Jun-2014
35	Princes Hwy, Sylvania - At Tom Uglys Bridge	Non-motorway	Thu 12-Jun-2014
36	Church St, Ryde - at Ryde Br	Non-motorway	Tue 17-Jun-2014
37	M7 Motorway - N of Great Western Hwy	Motorway	Tue 27-May-2014
38	M7 Mwy, Cecil Park - S of Elizabeth Dr	Motorway	Tue 27-May-2014
39	O'Riordan St, Alexandria - N of Johnson St	Non-motorway	Wed 11-Jun-2014
40	Pacific Hwy, Artarmon - S of Mowbray Rd	Non-motorway	Thu 22-May-2014

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