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Accident Research Centre

DESCRIPTIVE ANALYSIS OF
VICTORIAN MOTORCYCLE
COUNT DATA

FINAL REPORT

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Preface

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EXECUTIVE SUMMARY

Little exposure data are currently available for motorcyclist travel routes, presenting difficulties in delivering effective motorcycle safety measures that target the majority of riders. To address this, VicRoads commissioned MUARC (Monash University Accident Research Centre) to analyse extracted traffic count data for the period of 2004-2006 and provide a description of general motorcycle movement in Victoria.

Based on existing periodic data collection, a week's motorcycle data were analysed in isolation and with respect to other vehicle travel patterns. The collection sites were a sample of sites in Victoria and so findings are not intended to present popular sites with respect to all of Victoria, rather, within the collection sites.

Of the routes analysed, the southbound carriageway of Maroondah Highway, 1.4 km from Marysville and 83.9 km from Melbourne recorded the most motorcycles, 900 passing through the collection point in 2005, representing nearly 10% of all volumes of the top 30 collection sites. This was followed by the northbound section of Melba Highway, 1.4 km north of Kinglake Road, and 67.9 km from Melbourne, which recorded 585 motorcycles. The third highest motorcycle volume was recorded on Beach Road, westbound, west of "gate 2" with 582 motorcycles recorded. The sites popular with motorcycles were generally not the sites heavily trafficked by other vehicles.

Of the top 30 overall ranking for motorcyclist activity, 15 (50%) were rural sites. A comparison of motorcycle volumes to all vehicle volumes indicated a slightly higher proportion of motorcycles in rural areas when compared to metropolitan areas.

The largest number of motorcycles was recorded in the 100 km/h speed zone (50.9%) followed by the 60 km/h speed zone (32.7%). Travel in the 80 km/h zone comprised 12.3%. It is important to note that the proportion of travel recorded here is heavily influenced by the distribution of the collection sites amongst the speed limit zones. When comparing the top 30 sites and the proportion of volumes in the relevant speed zones, a more even balance in volumes in 100 km/h and 60 km/h speed zones is established with percentages of 44% and 41% respectively.

The analyses undertaken suggest that speeding may be a significant issue for motorcyclists along these routes, with 50% of the recorded motorcycle speeds exceeding the posted speed limit. Speeding was most likely in the lowest speed zone with 90% of motorcyclists exceeding the 40 km/h limit, with the gap decreasing for 60 km/h speed zones. Adherence to the limit was most likely in 70 km/h speed zones.

Weekends recorded more motorcycles through the sites, accounting for nearly half the motorcycles (42%). Motorcycle use was generally constant during the week, with slight peaks on Tuesday and Friday.

The majority of riding was undertaken during 'leisure hours', that is, on weekends and before 07:00 and after 18:00 on weekdays. Over half, (52%) of all riding was recorded during these timeframes. If only volume per hour is considered, then travel during business hours (09:00-16:00) produced the highest numbers.

This analysis was completed to provide a general, overall understanding of motorcyclist travel routes. For this purpose, the data were sufficient in providing an indication of general motorcycle volumes, as well as timing and location of motorcycle use. However, the

interpretations and conclusions that can be drawn are somewhat limited as firstly, few details of the data collection sites are available to determine the impact of the sites selected on the resultant findings; and secondly, the data were extracted from a general vehicle counts database. Comparing data from routes or areas with a non-uniform number of data collection points can be potentially misleading.

Similarly, seasonal factors are likely to have a bigger impact on riding behaviour than would be seen in car driving patterns. Counting equipment was not set up all year round, instead it was rotated across sites. Accordingly, the time of year a particular site was assessed will make a significantly bigger difference to motorcycle numbers than car numbers. Therefore, while providing general findings of motorcyclist activity at the sites in question, the findings are not intended to provide a substantial basis for comparison of motorcyclist activity at all routes in Victoria.

1.0 INTRODUCTION

1.1 BACKGROUND

While crash analysis provides an indication of the level of safety for a road user group, crash analysis combined with exposure data, i.e., the volumes and characteristics of traffic along a route, places this in some perspective, and provides a more clear reflection of the existing safety conditions. Similarly, being aware of the highly trafficked routes of a particular road user group allows safety measures to be focussed at particular locations regardless of the crash history, and provides potential for significant future benefits.

Currently, little exposure data are available for motorcyclist routes. This presents a problem in ascertaining the effect of previous motorcycle safety measures, and in determining the locations of need for future safety initiatives. Relative risk and road user behaviours between motorcyclists and other road users can also be more effectively compared through exposure data.

In light of this, VicRoads commissioned MUARC (Monash University Accident Research Centre) to analyse extracted traffic count data for the period of 2004-2006 and provide a description of general motorcyclist movements in Victoria.

1.2 OBJECTIVE

The objective of this project was to provide a descriptive analysis of motorcycle exposure data using the dataset provided by VicRoads. It attempted to answer the questions, “*Where are motorcyclists predominantly riding in Victoria?*” and “*What are the typical characteristics of this riding?*” using the available data. A comparison with all road user group characteristics has also been made.

This report highlights and discusses results in terms of the highly trafficked motorcyclist routes and prominent roads in Victoria.

2.0 METHOD

VicRoads periodically collects traffic data on a four-yearly cycle, through the use of the MetroCount system. The data collection is not specifically set up to collect motorcycle data and so for the purpose of this project the data were reprocessed, allowing for the identification of motorcycles alongside other types of vehicles (cars and trucks).

Data were provided in two separate entities: dealing specifically with 2005 motorcycle data, and “combined data” that provided traffic counts on all vehicles, including motorcyclists. The data were presented in a large Microsoft Excel file containing data and a small number of initial macro analyses already completed. The principal data were traffic counts of all vehicles – “combined data” – and a series of spreadsheets containing motorcycle counts according to the speed zone of travel. The formats of these data sets were different and so the possible analyses using the datasets were different and methods for each have been described separately below. Selection of the collection sites appears to not have an easily identifiable basis, though it is likely to be based more on passenger and commercial vehicle criteria and not specifically on motorcyclist activity. Some roads also contained more than the one collection site.

While processing the motorcycle count data, a significant number of duplicate counts emerged. SPSS allows for duplicates to be tracked for any individual or combination of variables, and this instance the duplicates were identified via the variables time and speed. The file included a timestamp of each count accurate to the second, and speed to tenths of a kilometre per hour (ie one decimal place). Of the 41,735 entries in the original datafile, almost 10,800 (or 26%) were duplicates (see Table i below), though it is likely a proportion of these counts were actual motorcycles; motorcycles travelling at the same speed when crossing the pneumatic tube, and motorcyclists riding abreast in a lane and crossing the tube in the same instant. It is assumed, however, that the 9,672 instances in which both the speed and time stamp are identical are file duplicates – motorcycles that did not exist. Subtracting these counts results in 32,063 individual motorcycles counted

Table (i) – duplicate numbers

Duplicate	Number	Percentage of total
Non-duplicate	30,937	74.1%
Speed duplicate	101	0.2%
Time duplicate	1,025	2.5%
Speed & time duplicate	9,672	23.2%
Total	41,735	100%

2.1 2005 MOTORCYCLE DATA

Motorcycle only counts were provided for year 2005 only. Each line within these data represented an individual motorcycle travelling within the relevant speed zone.

The 2005 data consisted of 314 count entries, with a total of 32,063 motorcycles counted. Each of these entries was treated as a separate site (or site-count) within the relevant speed zone, though they are not unique geographical sites. In most instances a particular geographic site has two separate count entries in the file as the motorcycles were counted separately in each direction, e.g. southbound and northbound. When pneumatic counting tubes are deployed in pairs – A tube and B tube – across a roadway, whether a vehicle strikes the A or B tube first indicates the direction of travel. Accordingly A→B traffic and B→A traffic can be counted simultaneously but separately. In many instances two such sites will likely double-count actual motorcycles over the period of a day, travelling to and from some location. The fact that matching sites generally count similar numbers of motorcycles lends support to this hypothesis. In these cases, only the direction of traffic with the highest volume is presented in the list, to provide a wider representation of highly trafficked motorcycle routes, maximising the number of roads and locations that can be practically displayed in this report.

Data were provided in separate Excel spreadsheets for 40 km/h, 50 km/h, 60 km/h, 80 km/h, and 100 km/h speed zones and included the following information: a numeric code for the count site, date and time for the noted motorcycle, and its actual speed of travel. After some data cleaning, particularly in relation to the date and time entries that were not always consistently formatted, and removal of any duplicates, the motorcycle count data were imported into the SPSS statistical program. The numeric count site code was converted to a site name (by matching to information provided by VicRoads) and each motorcycle count time was recoded into one-hour intervals (midnight-1 am, 1 am-2 am, etc).

The actual travelling speed of each counted motorcycle was included in the data, making it possible to calculate the 85th percentile and other speed measures. Comparison in relation to all vehicle speeds was not made possible as speed zone and actual vehicle speed were not provided for other vehicles.

Hourly summary counts within both the motorcycle and the combined counts were calculated.

As the data do not provide any information regarding the purpose of a particular motorcycle journey (nor the origin or destination), some inferences were drawn as to the purpose of the motorcycle ride: the week was classified into three periods: a ‘commuting’ period was defined as 07:00 – 09:00 and 16:00-18:00 on weekdays, work related travel was defined as 09:00 - 16:00 on weekdays, and ‘leisure’ travel consisted of the remainder – early morning, late evening and weekends. This scheme has been used for other research involving motorcyclists and fleet safety projects.

It is noted that rankings of highly trafficked routes are only relative to other collection sites and not intended to apply to all Victoria. For example a finding that sections of Maroondah Highway have the highest motorcycle activity is true only in comparison to the other collection sites and not all of Victoria, as the data provided do not cover all Victorian roads. In this report, the use of “sites” is a reference to data collection sites therefore, and not all sites in Victoria. The site names and descriptions are used directly from the dataset.

In addition, while the report refers to number of “motorcycles” through a site, it is noted that it is possible the same motorcyclist is travelling on more than the one occasion through the site, and so could be “double counted”.

2.2 COMBINED DATA

Each line in the combined data spreadsheet represented a count collection location for a particular day, from 12 July 2004 to 23 August 2006. There were some 12,800 unique count-location-days (i.e. 12,800 rows of data).

Other than the date (and therefore day of the week, month and year) and location, the information provided for each row of data included whether the site was metropolitan or rural, whether the data “passed” a quality test, the number of trucks counted for that day and location and, separately, the total number of vehicles and motorcycles counted within each hour of that day (midnight to 01:00, 01:00 – 02:00, etc).

Each row in the combined data was summary rather than individualised data, and represented a count-day-location rather than an individual location or an individual vehicle. Accordingly, the combined data were not imported into SPSS. Instead, a variety of Excel-based operations were used to manipulate, transform and analyse the data as needed.

The combined data included hourly counts for motorcycles and all vehicles; the former were subtracted from the latter to produce hourly counts for what would, in the main, be cars (including 4WDs, vans, etc.). Truck counts were also provided, but only as a total for each day-location rather than for each hour at each day-location, and so could not be subtracted from all vehicles in producing the aforementioned “car” hourly counts. Across the 26-month period, a total of 124,013 motorcycles and 27,241,470 “cars” were counted, resulting in less than 0.5% of motorcyclists in the data collected.

3.0 RESULTS

The results section is divided into two sections. Section 1 – Motorcycle Analysis – reports only on the motorcycle data provided for 2005. These data contain considerable detail that allows the identification of key motorcyclist travel characteristics and behaviour. Section 2 – Comparison with All Vehicles – compares the analysis with all vehicle data where available and is based on 2004-2006 data.

For clarity of reporting and ease of comprehension of findings, Section 1 focusses on the top 30 sites extracted from the analysis, as well as highlighting in the text other potential routes of interest in relation to motorcycle riding in Victoria. Where several sections of one route in close proximity to each other emerge within the top 30, only the section of highest volume has been reported. Likewise, where the opposite direction of one section is within the top 30, only the direction with the highest volume has been included in the top 30. That is, if both the northbound and southbound directions of a particular section of Maroondah Highway emerge as having high motorcyclist activity, the section lower on the top 30 list was deleted from the final list. This allows a general, large-scale view of the travelled routes to be provided without an over emphasis on one prominent route. A subsequent study could provide more detailed analysis on any prominent routes should the need arise.

3.1 MOTORCYCLE ANALYSIS

3.1.1 General Characteristics

To provide a better indication of general travel patterns of motorcyclists along the selected routes, data have been analysed in terms months, days, and hour of travel (Figures 1 - 4).

Month of Year

Figure 2 shows the distribution of motorcycle counts across the months of the year (2005). The graphs indicate that motorcycle travel peaks at two significant points in the year, March and November. It is not surprising that end of summer and late spring seem to be the most popular riding periods, with less riding in the height of summer and winter due to adverse weather conditions. However, there are a number of cautionary notes in interpreting these data. School holidays were generally not included in the collection period, (though analysis of data by month indicates some data in the holiday period), resulting in a lower raw count at those times of the year. Additionally, and perhaps more importantly, individual sites were not counted all year round, or even across seasons. Accordingly, if a number of popular motorcycling routes are counted when the weather is more conducive to riding then the raw counts will be elevated, or depressed if the counting cycle for those routes happens to fall during the winter months. Notwithstanding these, it is noted that the two peaks in March and November coincide with the timings of the Formula 1 Grand Prix, held in March and the Motorcycle Grand Prix usually held in mid October at Phillip Island, potentially triggering a surge of motorcycling enthusiasm. Figure 1b confirms that the resulting two peaks are not merely an effect of there being greater count sites during these two months as Mar, Apr & May were similar to each other, as were Sept, Oct & Nov. September having the greatest number of count sites during the year, and October also accounting for a large proportion of count sites. If the number of count sites was the only factor in motorcycle numbers then counts in Apr & May should be similar to Mar, & counts in Sep should exceed

that for Nov, & Sept, Oct & Nov should all exceed Mar, yet these are reflected in the respective proportionate motorcycles counts. In fact quite a bit of variation is present. Therefore it is likely the peaks are a reflection of motorcycle numbers or potentially more complex influences on the data collection.

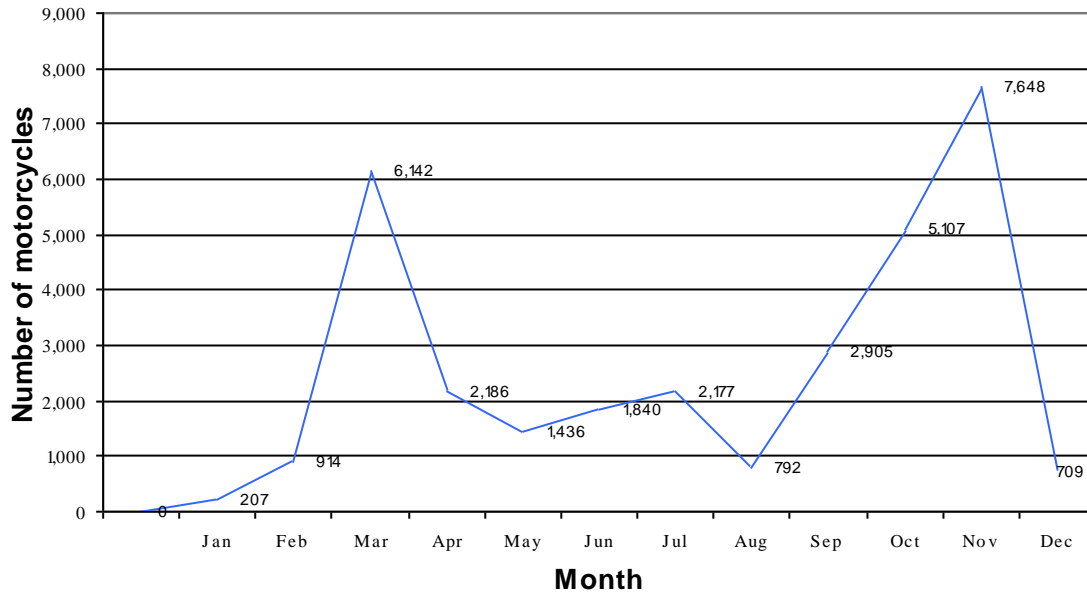


Figure 2a - Volume of motorcyclists through selected routes based on month of travel

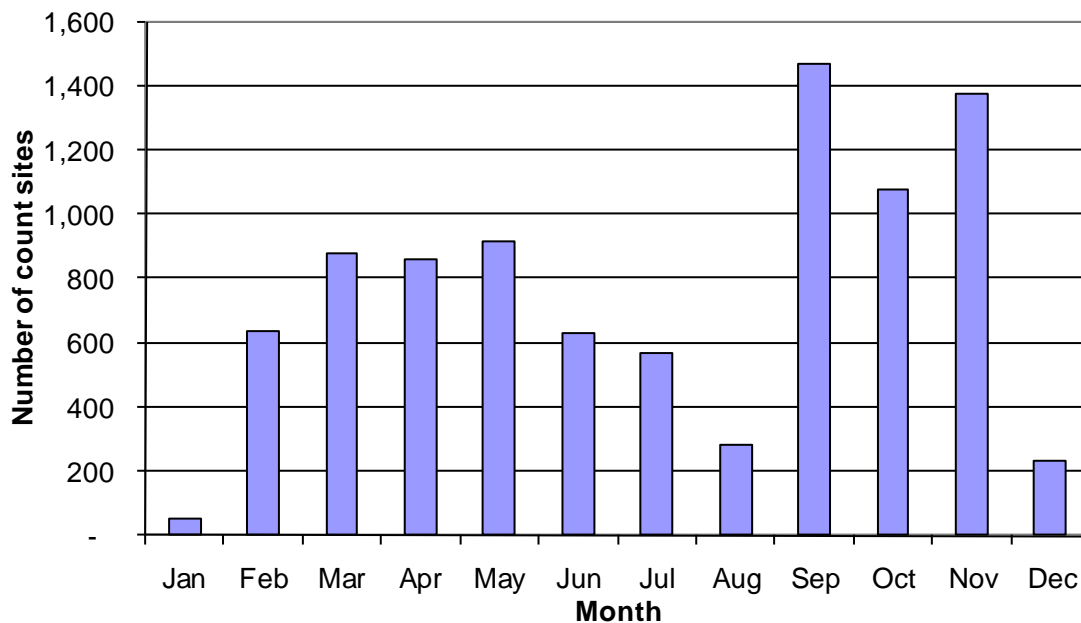


Figure 3b – Number of count sites during each month in 2005

Day of Week

In terms of travel patterns during a week, Saturday and Sunday appear to be the most popular days for motorcycling (Figure 4), Sundays producing almost double the number of motorcyclists of any given weekday. Of the weekdays, Tuesday and Friday recorded slightly higher numbers of motorcycles, when compared to the rest.

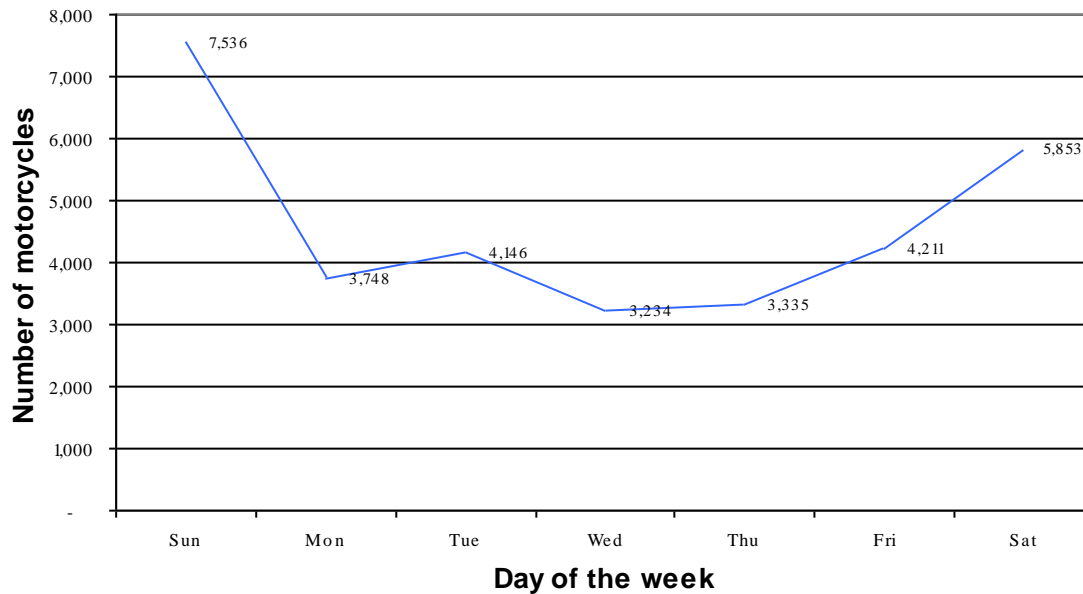


Figure 4 - Volume of motorcyclists through selected routes based on day of week

Time of Day

Figure 5 presents time-based motorcycle activity during the course of the day, irrespective of the day of week. It can be seen that a steady increase in motorcycle numbers occurs from around 06:00 and peaks around 14:00-15:00 with a more rapid decline in numbers from then. This peak in the middle of the day falls under “business hours” category - potential reason for the peak is unclear, except as a result of any influence on total numbers of weekend travel during these times. A further study could look at any interactions with weekend travel and time.

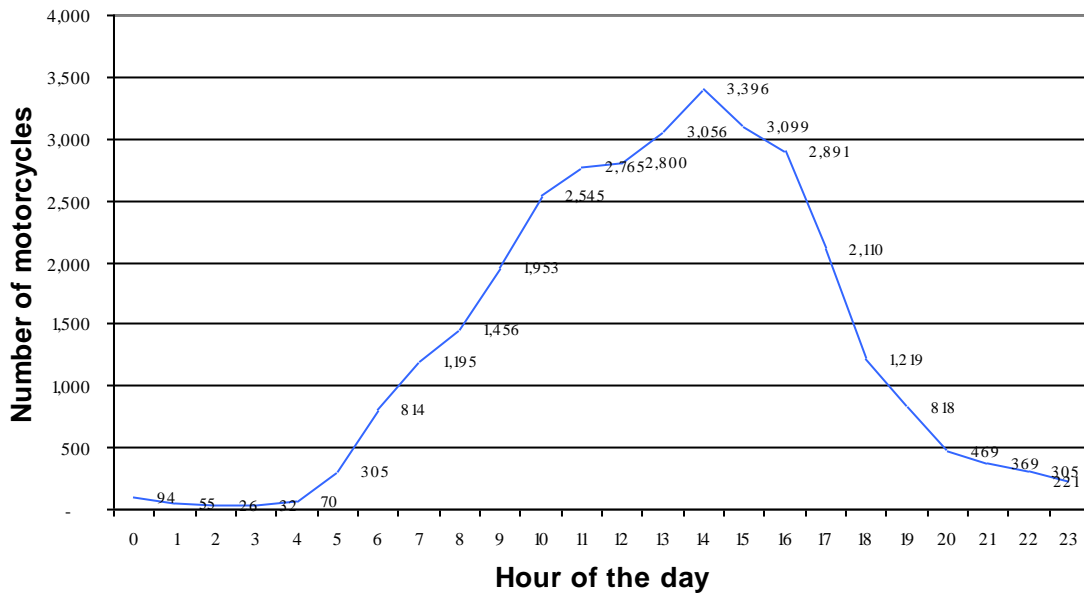


Figure 5 - Volume of motorcyclists through selected routes based on hour of day

Combining hours of day and day of week, motorcycle travel was summarised in to travel-purpose categories. All travel from Monday to Friday between the times 07:00 – 09:00 & 16:00 – 18:00 was assumed to be “**commuter-related**” travel. All travel from Monday to Friday between 09:00 and 16:00 is generally during business hours and therefore was considered to be **work-related**. **Leisure** travel was defined as periods before 07:00 and after 18:00 on a weekday and all weekends. Figure 6 displays the number of motorcycles counted within each time category.

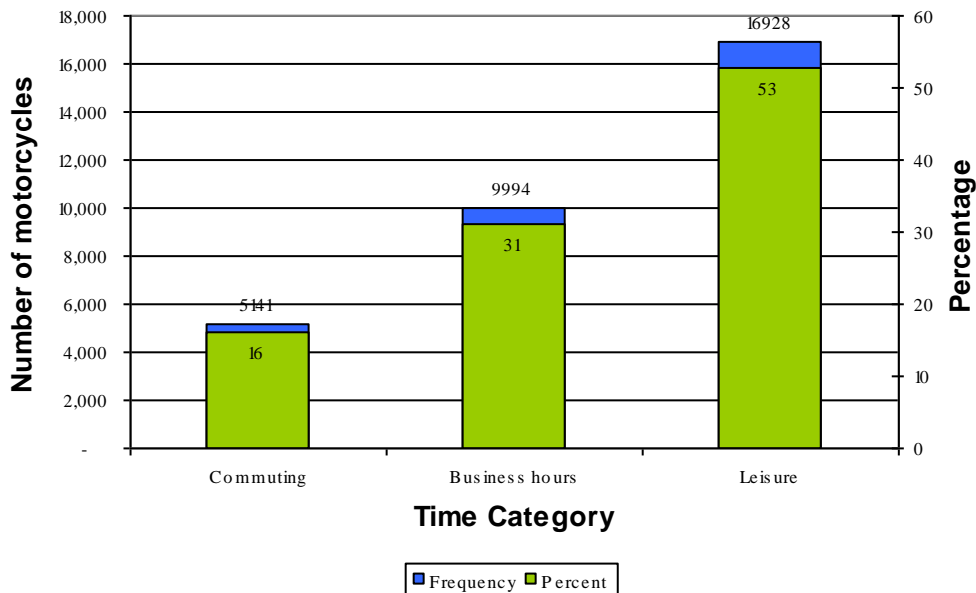


Figure 6 - Motorcycle numbers as a function of time category

Around half (53%) of all motorcycle activity occurred during the “leisure” period while 31% occurred during working hours and 16% during commuting hours. This corresponds well with findings in Figure 4 where much larger numbers of motorcyclists were recorded on Saturday

and Sunday. It is noted that these percentages in the time categories are not directly comparable however, as the number of hours that make them up vary from 113 leisure hours down to 20 commuter hours per week. When considered in terms of the number of motorcycles counted per hour, 257 motorcycles were counted per commuter hour. During work hours, 286 motorcycles were counted per hour, and 150 motorcycles were counted per leisure hour, indicating that per hour the most motorcycle activity occurred during work hours. On the other hand with over half of motorcycle activity being leisure related, “leisure hour travel” is an important variable to consider when designing motorcycle programs to address the largest proportion of motorcyclists.

When considering geographical influences, there appears to be somewhat greater motorcyclist activity in rural areas with respect to these time categories compared to metropolitan areas (Figure 7), between 32-39% comprising metropolitan travel. This could be due to a number of reasons, including the fact that rural routes tend to be more conducive to motorcyclist leisure travel, with faster speed limits, more winding roads and less congestion; as well as longer distances and reduced public transport options in rural areas making walking, cycling and public transport usage less popular and motorcycling a suitable alternative.

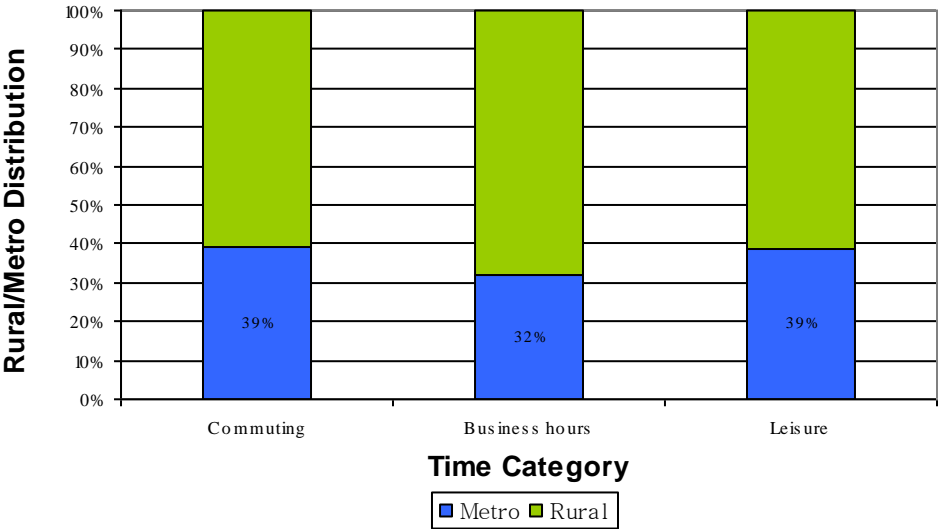


Figure 7 - Travel purpose in metro and rural areas

3.1.2 Overall Site Rank

Table 1 and Figure 8 provide the top 30 sites out of the 314 collection points for motorcycle volumes at the selected data collection sites. The top 30 sites contributed around 30% of all volumes at these sites. As mentioned above, sites that had both directions of traffic movement among the top 30 had the direction with the lower volumes removed from the top 30 list.

Of the collection sites in 2005, Maroondah Highway, 1.4 km south of Marysville road and 89.3 km from Melbourne, on the southbound carriageway, ranked by far, as the most travelled by motorcyclists, with 900 motorcycle movements recorded through the point, and accounting for around 3% of all motorcyclist travel at the selected collection sites. This was followed by the section along Melba Highway northbound carriageway, 1.4 km north of Kinglake at 67.9 km north of Melbourne, and Beach Road westbound carriageway, carrying 585 and 582 motorcycles respectively through the sections. These three sections in total comprised 6-7% of the total motorcycle volumes within the selected collection sites.

Five sections of Maroondah Highway are represented in the top 30, making it the road most travelled by motorcyclists relative to other data collection sites. Including only the one direction per road section, volumes on Maroondah Highway contributed to nearly 2,361 motorcycles, or around 7%, of the total volume. Sites commonly associated with recreational motorcycling travel, such as the Yarra Boulevard, Phillip Island, Great Ocean Road, and Geelong Road came further down the entire list (not all included in table), ranked 19 (306 motorcycles), 41 (205 motorcycles), 43 (196 motorcycles), and 107 (80 motorcycles) respectively.

Around half the volumes (46%) in the top 30 were on highways or freeways. The remainder include tourist routes like the Great Alpine Road or local roads like Buckley St or Hall Road.

Table 1 - Top 30 of all collection sites for motorcycle volumes in 2005

Rank	Site	Count	% of top 30 unique sites	% of all sites
1	MAROONDAH HWY S BD 1.4 KM S OF MARYSVILLE RD @ 83.9KM FROM MELBOURNE	900	9.3	2.8
3	MELBA HWY N BD 1.4 KM N OF KINGLAKE RD @ 67.9KM FROM NORTH OF MELBOURNE	585	6.1	1.8
4	BEACH RD W BD W OF GATE 2	582	6.0	1.8
5	MAROONDAH HWY S BD 2.3KM N OF YARCK RD @146.2KM FROM MELBOURNE	572	5.9	1.8
8	MAROONDAH HWY S BD 800M S OF YARCK RD @143.3KM FROM MELBOURNE	427	4.4	1.3
9	BUCKLEY ST W BD BTW BILSTON ST & ADMIRAL ST	393	4.1	1.2
11	PHW ON RAMP NEBD NE OF BEACH RD	369	3.8	1.2
13	MATTHEWS AV NWBD BTW DROMANA AV & WESTFIELD DR	337	3.5	1.1
14	CRANBOURNE-FRANKSTON RD NEBD BTW HALL RD & SCARBOROUGH AV	335	3.5	1.0
15	MAROONDAH LINK HWY S BD 2.1KM N OF GOULBURN VALLEY HWY @ 56.9KM FROM SEYMOUR	334	3.5	1.0
16	BACCHUS MARSH-GISBORNE RD NEBD BTW HOLTS LA & SOMERTON CT	315	3.3	1.0
18	WESTERN PORT HWY N BD BTW CRANBOURNE-FRANKSTON RD & CARRBOYD RD	315	3.3	1.0
19	YARRA BVD SWBD 500M SW OF YARRA ST	306	3.2	1.0
21	MELBA HWY N BD 1.4 KM N OF LANGS RD @100.0KM FROM MELBOURNE	302	3.1	0.9
23	GOULBURN VALLEY HWY W BD 600M E OF LIMESTONE RD @ 41.3KM FROM SEYMOUR	282	2.9	0.9
24	AVALON RD N BD BTW COZENS RD & COONAWARRA DR	267	2.8	0.8
27	BACCHUS MARSH RD NWBD BTW WOOLPACK RD & WESTERN HWY	258	2.7	0.8
28	CRANBOURNE-FRANKSTON RD NEBD BTW HALL RD & BROOKLAND GREENS BVD	251	2.6	0.8
29	MAROONDAH HWY N BD 1.5 KM S OF WHANREGARWEN RD @124.0KM FROM MELBOURNE	235	2.4	0.7
31	MAROONDAH HWY S BD 100M S OF SPRING CREEK RD @135.0KM FROM MELBOURNE	227	2.4	0.7
32	HALL RD E BD BTW EVANS RD & WESTERN PORT HWY	225	2.3	0.7
33	GISBORNE RD N BD BTW BACCHUS MARSH RD & BENNETT ST	224	2.3	0.7
34	HALL RD NWBD BTW CRANBOURNE-FRANKSTON RD & EVANS RD	220	2.3	0.7
38	RAILWAY AV NEBD BTW DERRIMUT RD & CEMETERY RD	208	2.2	0.6
41	PHILLIP ISLAND RD E BD BTW CHURCHILL RD & @ 14KM POST	205	2.1	0.6
42	IRONBARK RD E BD 200M W OF BARNARD ST @ 0.2KM POST	201	2.1	0.6
43	GREAT OCEAN RD NEBD 400M W OF COALMINE CREEK	196	2.0	0.6
44	BACCHUS MARSH-GISBORNE RD N BD 400M S OF WESTERN FWY @ 1.2KM FROM BACCHUS MARSH	195	2.0	0.6
47	BENDIGO REDESDALE RD E BD 500M W OF EDWARDS RD @ 2.5KM POST	190	2.0	0.6
48	CALDER HWY S BD 1KM N OF OLYMPIC PDE @157.0KM FROM MELBOURNE	185	1.9	0.6
Total		9641	100.0%	30.1%

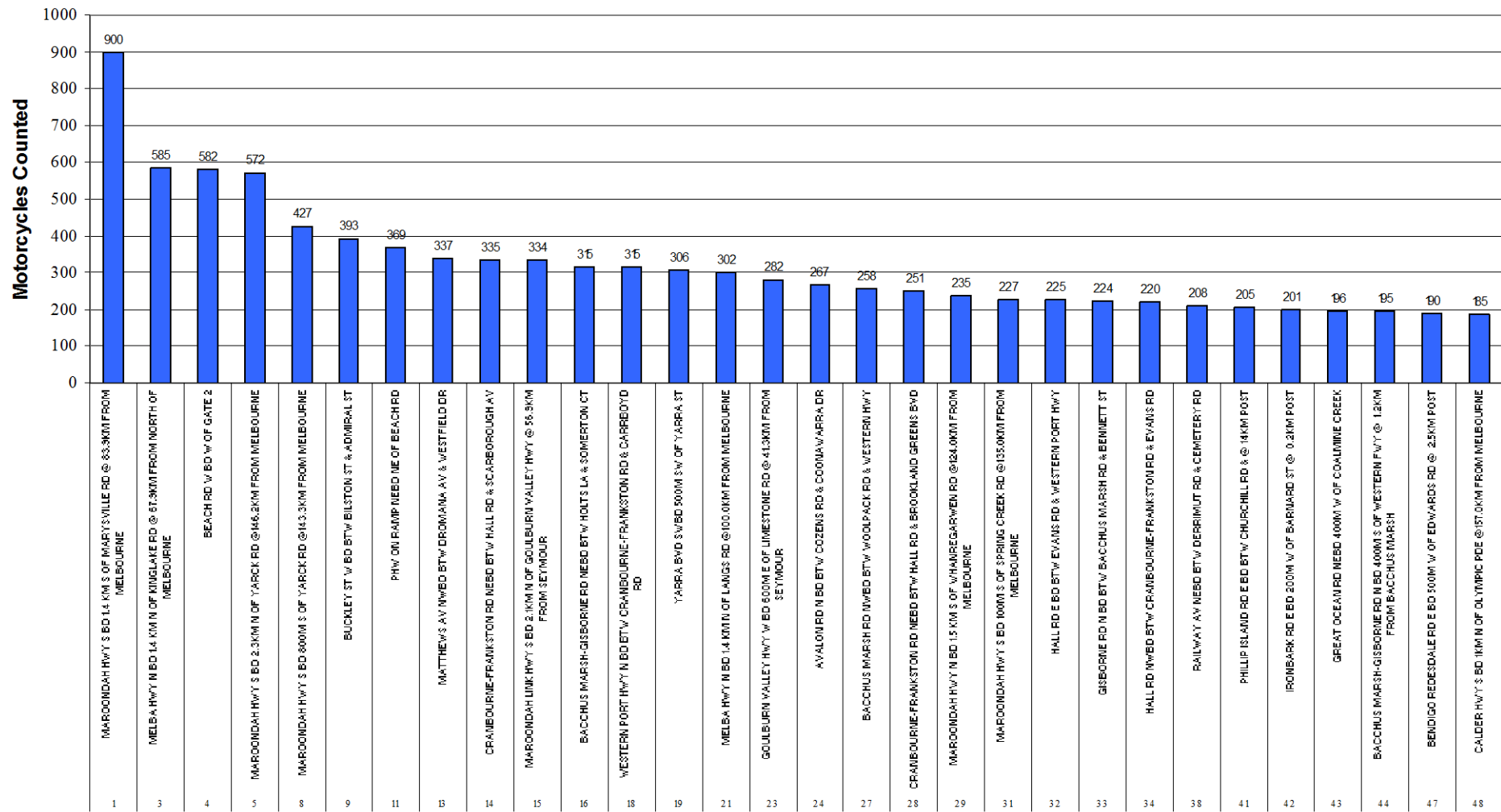


Figure 8 - Total number of motorcycles travelling through all collection points (2005) – Top 30 unique sites

3.1.3 Location

Metropolitan

Table 2 and Figure 9 present the top 30 road sections for highest motorcycle volumes amongst the metropolitan data collection sites. The volumes at these sites contribute to over half of total volumes (11,792) at the metropolitan collection sites, and produced nearly 6300 motorcyclist movements. Beach Road, westbound, “west of Gate 2” ranked 1 (582 motorcyclists), and Buckley Street, westbound, between Bilston and Admiral Streets ranked 2, with considerably lower volumes, 393 motorcyclists, and together the two sites comprised around 8% of motorcycle traffic among the metropolitan collection sites. Among routes typically associated with riding, Yarra Boulevard, 200 m south of Yarra Street ranked 10 with 306 motorcyclists recorded, Phillip Island Road, ranked 33, (132 motorcyclists) and Geelong Road (45 with 87 motorcyclists). Bacchus Marsh Road, Beach Road and Gisborne Roads are routes that appear three times each in the top 30, and Hall Road in the vicinity of Evans Road and Cranbourne Frankston Roads appear twice.

Table 2 - Top 30 metropolitan sites for motorcycle volumes in 2005

Rank	Site	Count	% of top 30 metro sites	% all metro sites
1	BEACH RD W BD W OF GATE 2	582	9.3	4.9
2	BUCKLEY ST W BD BTW BILSTON ST & ADMIRAL ST	393	6.3	3.3
3	PHW ON RAMP NEBD NE OF BEACH RD	369	5.9	3.1
5	MATTHEWS AV NWBD BTW DROMANA AV & WESTFIELD DR	337	5.4	2.9
6	CRANBOURNE-FRANKSTON RD NEBD BTW HALL RD & SCARBOROUGH AV	335	5.3	2.8
7	BACCHUS MARSH-GISBORNE RD NEBD BTW HOLTS LA & SOMERTON CT	315	5.0	2.7
9	WESTERN PORT HWY N BD BTW CRANBOURNE-FRANKSTON RD & CARRBOYD RD	315	5.0	2.7
10	YARRA BVD SWBD 500M SW OF YARRA ST	306	4.9	2.6
12	AVALON RD N BD BTW COZENS RD & COONAWARRA DR	267	4.2	2.3
14	BACCHUS MARSH RD NWBD BTW WOOLPACK RD & WESTERN HWY	258	4.1	2.2
15	CRANBOURNE-FRANKSTON RD NEBD BTW HALL RD & BROOKLAND GREENS BVD	251	4.0	2.1
17	HALL RD E BD BTW EVANS RD & WESTERN PORT HWY	225	3.6	1.9
18	GISBORNE RD N BD BTW BACCHUS MARSH RD & BENNETT ST	224	3.6	1.9
19	HALL RD NWBD BTW CRANBOURNE-FRANKSTON RD & EVANS RD	220	3.5	1.9
21	RAILWAY AV NEBD BTW DERRIMUT RD & CEMETERY RD	208	3.3	1.8
26	BEACH RD E BD E OF MAIN ENTRANCE	175	2.8	1.5
28	ANDERSON ST NWBD 200M NW OF ALFRED RD	156	2.5	1.3
29	GISBORNE RD NEBD BTW HOLTS LA & W'N FWY WB ONRAMP (ON BRIDGE)	155	2.5	1.3
30	COTTRELL ST NEBD BTW WERRIBEE RIVER & WEDGE ST	150	2.4	1.3
33	PHILLIP ISLAND RD W BD 400M E OF WOOLAMAI BEACH RD @ 2.6KM FROM SAN REMO	132	2.1	1.1
35	BEACH RD NWBD BTW OLD MELBOURNE RD & PRINCES FWY	114	1.8	1.0
37	EVANS RD S BD BTW HALL RD & NAVARRE DR	111	1.8	0.9
39	GISBORNE RD N BD BTW BENNETT ST & LERDERDERG ST	100	1.6	0.8
40	WESTERN FWY WB OFFRAMP TO BACCHUS MARSH RD	92	1.5	0.8
42	MCNAMARA AV S BD BTW LAURENCE AV & PETERS ST	91	1.4	0.8
43	BACCHUS MARSH RD W BD BTW GISBORNE RD & GELL ST	88	1.4	0.7
44	GRANT ST N BD BTW GRIFFITH ST & TAVERNER ST	88	1.4	0.7
45	GEELONG RD NEBD BTW WERRIBEE ST & GALVIN RD	87	1.4	0.7
52	BACCHUS MARSH RD W BD BTW FISKEN ST & LORD ST	70	1.1	0.6
53	HEREFORD RD NWBD E OF ANDERSON ST ROUNDABOUT	69	1.1	0.6
Total		6283	100.0%	53.3%

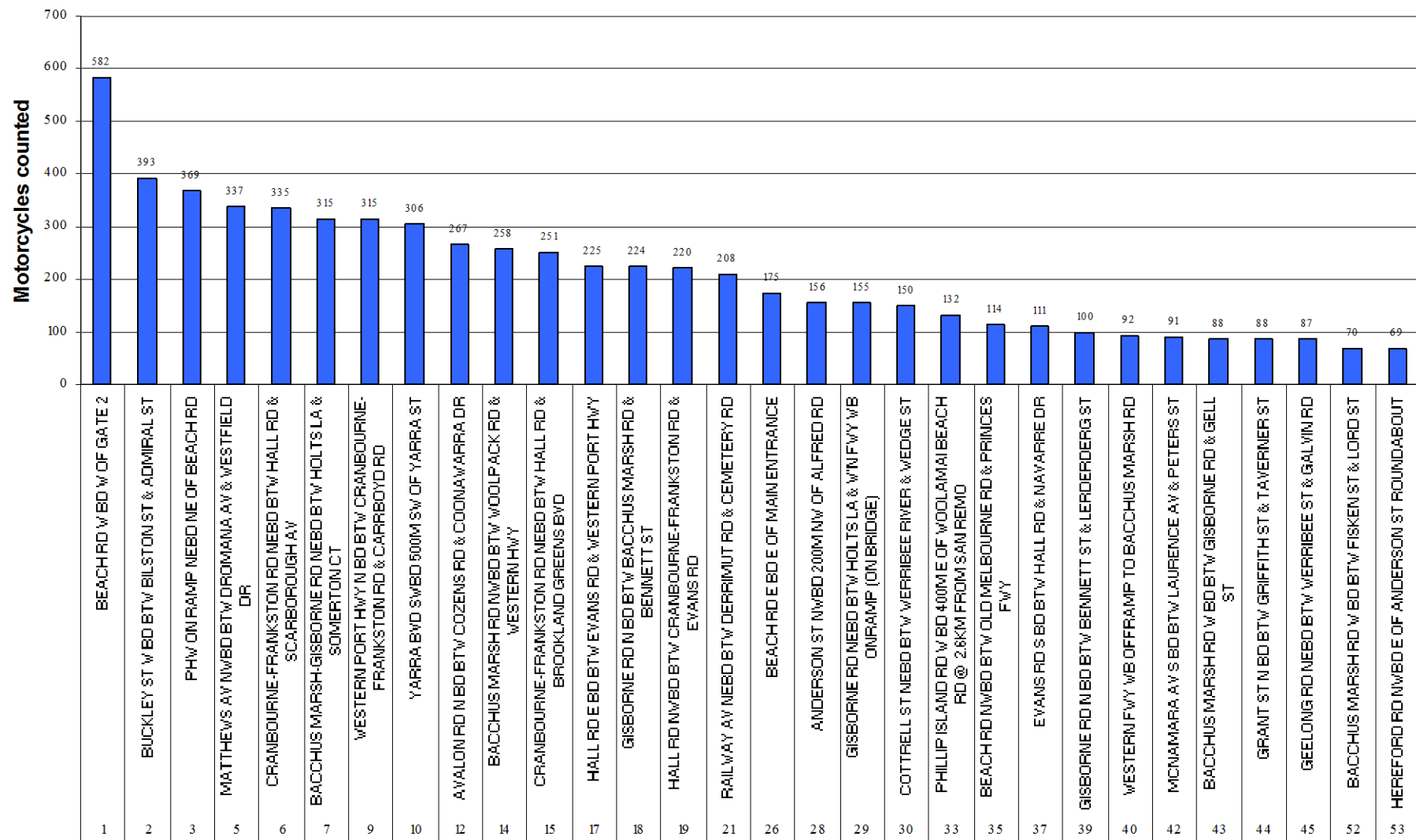


Figure 9 - Total number of motorcycles travelling through metropolitan collection points (2005) – Top 30 sites

Rural

Table 3 and Figure 10 present the top 30 road sections that had the highest motorcycle volumes in rural areas for 2005, these together totalled 35% of all motorcycle volumes within the rural collector sites. The highest ranking site overall, is also the highest ranking rural site: Maroondah Highway, southbound carriageway, 1.4 km south of Marysville Road, 83.9 km from Melbourne, with a volume of 900. The volume at the rural site ranked 1 is approximately one and a half times that of the metropolitan site ranked 1 (582), potentially due to reasons mentioned earlier, such as rural routes being more conducive to leisure riding, and the greater distances and lower availability of public transport presenting motorcycling as the preferred option to walking, cycling and public transport usage. Melba Highway, 67.9 km north of Melbourne, is the 2nd most travelled route within the rural sites. There is a marked difference in volume between the first and second ranks, as between the third and the fourth. Several sections of Maroondah Highway are represented in the top 30, and produce around 13% of all motorcyclist volumes among the rural collection sites. Sections of the Goulburn Valley Highway (282 motorcyclists), Phillip Island Road (205 motorcyclists), Great Ocean Road (196 motorcyclists), Calder Highway (185 motorcyclists), Midland Highway (131 motorcyclists), and South Gippsland Highway (115 motorcyclists) are all represented in the top 30.

Table 3 - Top 30 rural sites for motorcycle volumes in 2005

Rank	Site	Count	% of top 30 unique rural sites	% of total rural sites
1	MAROONDAH HWY S BD 1.4 KM S OF MARYSVILLE RD @ 83.9KM FROM MELBOURNE	900	12.5	4.4
3	MELBA HWY N BD 1.4 KM N OF KINGLAKE RD @ 67.9KM FROM NORTH OF MELBOURNE	585	8.2	2.9
4	MAROONDAH HWY S BD 2.3KM N OF YARCK RD @146.2KM FROM MELBOURNE	572	8.0	2.8
7	MAROONDAH HWY S BD 800M S OF YARCK RD @143.3KM FROM MELBOURNE	427	6.0	2.1
9	MAROONDAH LINK HWY S BD 2.1KM N OF GOULBURN VALLEY HWY @ 56.9KM FROM SEYMOUR	334	4.7	1.6
11	MELBA HWY N BD 1.4 KM N OF LANGS RD @100.0KM FROM MELBOURNE	302	4.2	1.5
12	GOULBURN VALLEY HWY W BD 600M E OF LIMESTONE RD @ 41.3KM FROM SEYMOUR	282	3.9	1.4
14	MAROONDAH HWY N BD 1.5 KM S OF WHANREGARWEN RD @124.0KM FROM MELBOURNE	235	3.3	1.2
15	MAROONDAH HWY S BD 100M S OF SPRING CREEK RD @135.0KM FROM MELBOURNE	227	3.2	1.1
18	PHILLIP ISLAND RD E BD BTW CHURCHILL RD & @ 14KM POST	205	2.9	1.0
19	IRONBARK RD E BD 200M W OF BARNARD ST @ 0.2KM POST	201	2.8	1.0
20	GREAT OCEAN RD NEBD 400M W OF COALMINE CREEK	196	2.7	1.0
21	BACCHUS MARSH-GISBORNE RD N BD 400M S OF WESTERN FWY @ 1.2KM FROM BACCHUS MARSH	195	2.7	1.0
23	BENDIGO REDESDALE RD E BD 500M W OF EDWARDS RD @ 2.5KM POST	190	2.6	0.9
24	CALDER HWY S BD 1KM N OF OLYMPIC PDE @157.0KM FROM MELBOURNE	185	2.6	0.9
25	IRONBARK RD W BD 200M W OF BARNARD ST @ 1.0KM FROM BENDIGO	178	2.5	0.9
26	GOULBURN VALLEY HWY W BD 200M W OF GHIN GHIN RD @ 35.0KM FROM SEYMOUR	168	2.3	0.8
27	MAROONDAH HWY E BD 1.4 KM E OF MIDLAND LINK HWY @187.0KM FROM MELBOURNE	156	2.2	0.8
28	SHEPPARTON ALTERNATIVE ROUTE N BD 900M S OF MIDLAND HWY @ 3.1KM FROM SHEPPARTON	155	2.2	0.8
30	HENTY HWY N BD 700M S OF GARDEN ST (PORTLAND) @ 4.2KM FROM PORTLAND PORT	153	2.1	0.8
32	MAROONDAH HWY E BD 600M E OF PYKES RD @193.6KM FROM MELBOURNE	152	2.1	0.7
33	BENDIGO REDESDALE RD W BD 500M W OF EDWARDS RD @ 2.5KM POST	151	2.1	0.7
34	GISBORNE-MELTON RD N BD 1.6 KM S OF COUANGALT RD @ 8.1KM FROM GISBORNE	143	2.0	0.7
35	DIGGERS REST-COIMADAI RD WB .4KM W OF HJORTHS RD	135	1.9	0.7
36	GISBORNE-MELTON RD S BD 1.6 KM S OF COUANGALT RD @ 8.1KM FROM GISBORNE	135	1.9	0.7
39	MIDLAND HWY N BD 3.1 KM N OF MIDLAND LINK HWY @ 45.2KM FROM BENALLA	131	1.8	0.6
40	BROADFORD-KILMORE RD W BD 4.3 KM E OF NORTHERN HWY @ 10.1KM FROM BROADFORD	129	1.8	0.6
43	WHITFIELD MANSFIELD RD S BD 100M N OF CARLISLE HILL RD @ 3.9KM FROM MANSFIELD	121	1.7	0.6
47	MELBOURNE-LANCEFIELD RD N BD 300M N OF GISBORNE-KILMORE RD @ 14.0KM FROM LANCEFIELD	115	1.6	0.6
48	SOUTH GIPPSLAND HWY W BD 400M W OF HOOKERS RD @ 91.4KM FROM MELBOURNE	115	1.6	0.6
Total		7,173	100%	35%

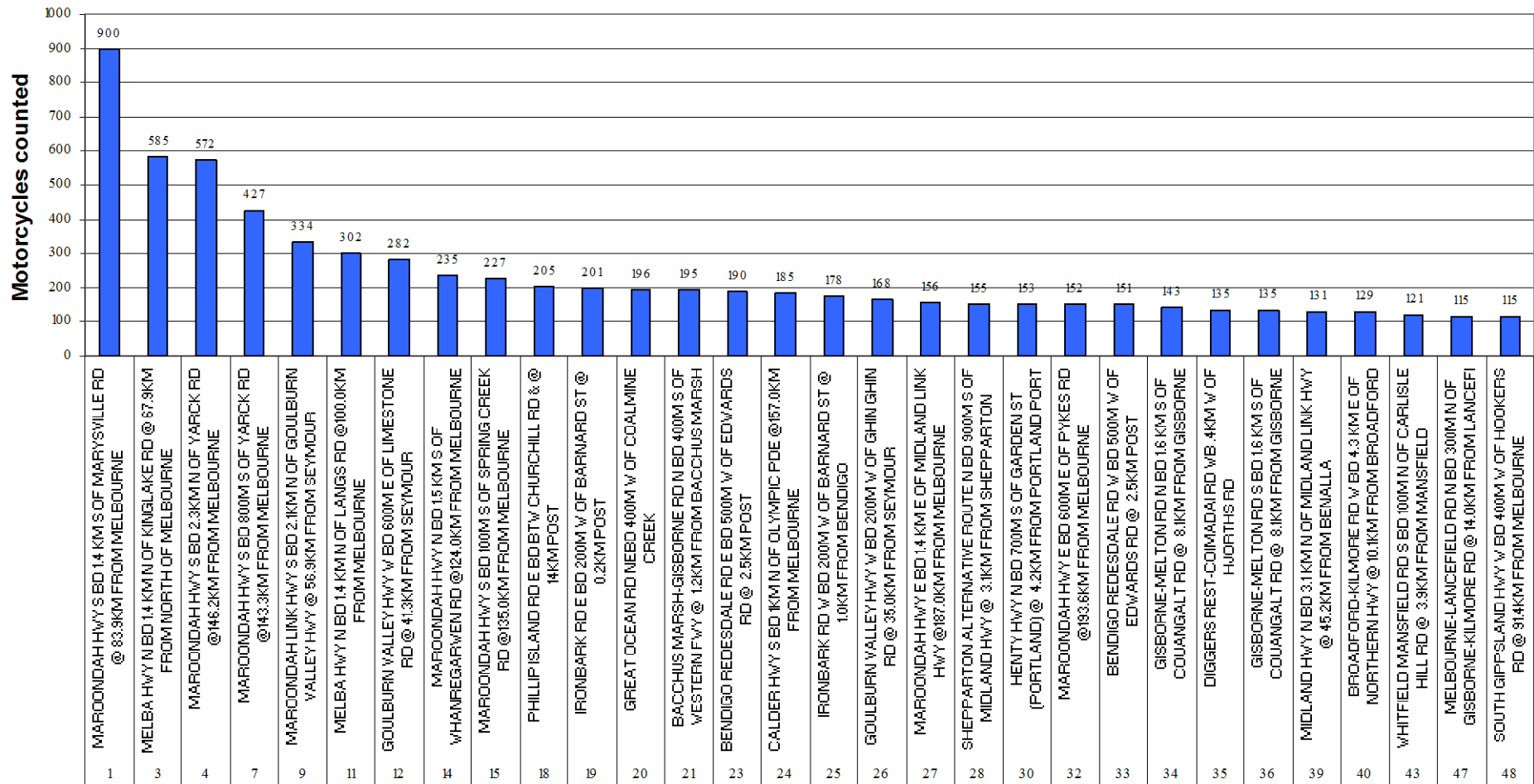


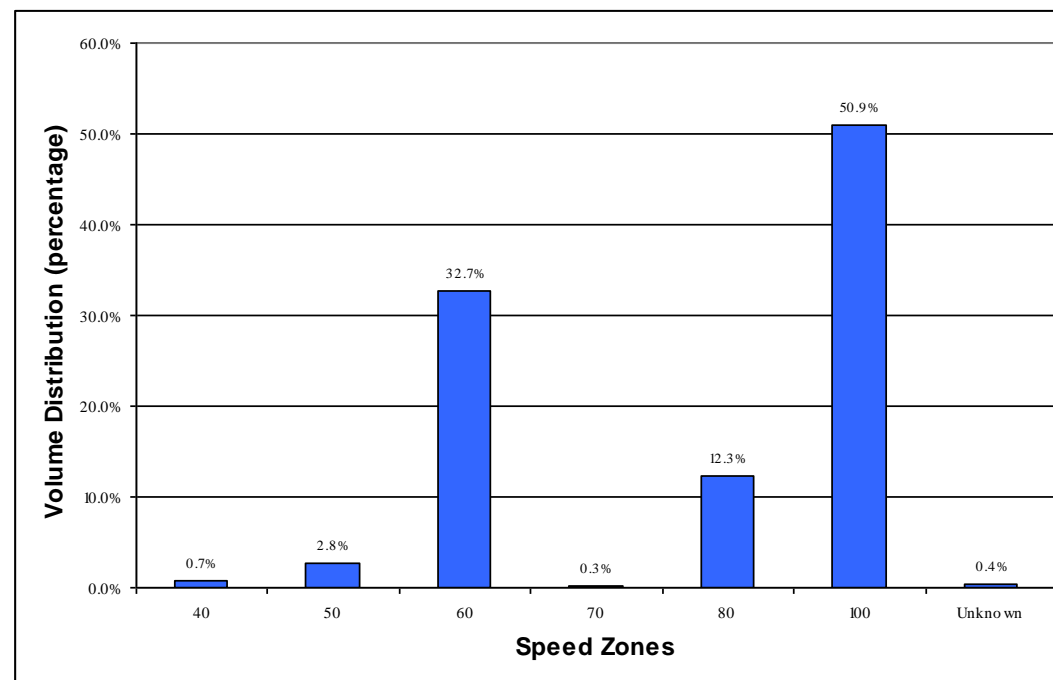
Figure 10 - Total number of motorcycles travelling through rural collection points (2005) – Top 30 sites

3.1.4 Posted Speed Limit

Most motorcyclist travel within the selected sites were undertaken on roads with 60 km/h, 80 km/h and 100 km/h speed limits, the three zones comprising 96% of motorcyclist travel (Figure 11). Around half the number of motorcycles (51%) was recorded on 100 km/h zoned roads. Next popular were roads zoned 60 km/h, with around 33% of motorcycle numbers, and around 12% on 80 km/h roads. It is important to note that the proportion of travel recorded here is heavily influenced by the distribution of the collection sites amongst the speed limit zones, as well as the proportion of road network exhibiting these speed limits. If speed proportions within the top 30 most sites are considered, a more helpful angle is presented, indicating that of the volumes produced in the top 30, 44% were in 100 km/h zones, and nearly the same (41%) in 60 km/h zones. This suggests that both 100 km/h and 60 km/h speed zones are equivalent generators of motorcycle volumes. This is supported by the knowledge that that many tourist roads are speed limited at 100 km/h and have road geometries conducive to leisure riding; while much of the commuter routes are speed limited at 60 km/h.

Speed Zones	Frequency	% of all sites	% of top 30 volumes in speed zones
40	231	0.7%	0
50	888	2.8%	3%
60	10,477	32.7%	41%
70	88	0.3%	0
80	3,953	12.3%	12%
100	16,310	50.9%	44%
Unknown	116	0.4%	0%
Total	32,063	100.0%	100%

(a)



(b)

Figure 11 – Percentage of Motorcycle Volumes by Speed Limit (a) and (b)

TOP 30 SITES WITHIN 60, 80 AND 100 KM/H ZONES

The following section identifies the top 30 sites for each of the three prominent speed zones, 60 km/h, 80 km/h and 100 km/h. Speed zones 40 km/h, 50 km/h and 70 km/h provided a limited number of sites and have been tabulated in Tables 4-6 for information.

Table 4 - 40 km/h routes

Rank	Road Section	Count	% of all sites in 40 km/h
1	MCNAMARA AV S BD BTW LAURENCE AV & PETERS ST	91	39%
2	MCNAMARA AV N BD BTW LAURENCE AV & PETERS ST	82	35%
3	GRANGE RD N BD BTW FULLARTON RD & OAK ST	31	13%
4	GRANGE RD S BD BTW FULLARTON RD & OAK ST	27	12%
Total		231	100%

Table 5 - 50 km/h routes

Rank	Road Section	Count	% of all sites in 50 km/h
1	YARRA BVD SWBD 500M SW OF YARRA ST	306	34%
2	YARRA BVD NEBD 500M SW OF YARRA ST	300	34%
3	FULLARTON RD NWBD BTW MOORNA DR & WATT ST	64	7%
4	ROBERTS RD W BD BTW MOORNA DR & PARER RD	50	6%
5	ROBERTS RD E BD BTW MOORNA DR & PARER RD	40	5%
6	PARER RD W BD BTW LOUIS ST & MATTHEWS AV	35	4%
7	FULLARTON RD SEBD BTW MOORNA DR & WATT ST	31	3%
8	HOOD ST W BD BTW BOWES AV & MATTHEWS AV	23	3%
9	PARER RD E BD BTW LOUIS ST & MATTHEWS AV	20	2%
10	SALE-HEYFIELD RD N BD 200M N OF PRINCES HWY EAST @	19	2%
Total		888	100%

Table 6 - 70 km/h routes

Rank	Road Section	Count	% of all sites in 50 km/h
1	AERODROME RD W BD 300M W OF SOMERTON PARK RD	53	60%
2	AERODROME RD E BD 300M W OF SOMERTON PARK RD	35	40%
Total		88	100%

Table 7 - Top 30 sites within 60 km/h zones

Rank	Road Section	Count	% of Top 30 unique sites	% of all sites in 60 km/h
1	BEACH RD W BD W OF GATE 2	582	10%	6%
2	BUCKLEY ST W BD BTW BILSTON ST & ADMIRAL ST	393	7%	4%
4	MATTHEWS AV NWBD BTW DROMANA AV & WESTFIELD DR	337	6%	3%
5	CRANBOURNE-FRANKSTON RD NEBD BTW HALL RD & SCARBOROUGH AV	335	6%	3%
6	BACCHUS MARSH-GISBORNE RD NEBD BTW HOLTS LA & SOMERTON CT	315	5%	3%
8	AVALON RD N BD BTW COZENS RD & COONAWARRA DR	267	5%	3%
10	CRANBOURNE-FRANKSTON RD NEBD BTW HALL RD & BROOKLAND GREENS BVD	251	4%	2%
12	HALL RD E BD BTW EVANS RD & WESTERN PORT HWY	225	4%	2%
13	GISBORNE RD N BD BTW BACCHUS MARSH RD & BENNETT ST	224	4%	2%
14	HALL RD NWBD BTW CRANBOURNE-FRANKSTON RD & EVANS RD	220	4%	2%
15	RAILWAY AV NEBD BTW DERRIMUT RD & CEMETERY RD	208	4%	2%
17	IRONBARK RD E BD 200M W OF BARNARD ST @ 0.2KM POST	201	3%	2%
18	BACCHUS MARSH-GISBORNE RD N BD 400M S OF WESTERN FWY @ 1.2KM FROM BACCHUS MARSH	195	3%	2%
21	BENDIGO REDESDALE RD E BD 500M W OF EDWARDS RD @ 2.5KM POST	190	3%	2%
22	IRONBARK RD W BD 200M W OF BARNARD ST @ 1.0KM FROM BENDIGO	178	3%	2%
23	BEACH RD E BD E OF MAIN ENTRANCE	175	3%	2%
25	ANDERSON ST NWBD 200M NW OF ALFRED RD	156	3%	1%
26	GISBORNE RD NEBD BTW HOLTS LA & W'N FWY WB ONRAMP (ON BRIDGE)	155	3%	1%
28	COTTRELL ST NEBD BTW WERRIBEE RIVER & WEDGE ST	150	3%	1%
32	BEACH RD NWBD BTW OLD MELBOURNE RD & PRINCES FWY	114	2%	1%
34	EVANS RD S BD BTW HALL RD & NAVARRE DR	111	2%	1%
35	BENDIGO-MARYBOROUGH RD E BD BTW CALDER HWY & CARPENTER ST	109	2%	1%
36	PHILLIP ISLAND RD WB BTW BRIDGE & FORREST AV	106	2%	1%
39	GISBORNE RD N BD BTW BENNETT ST & LERDERDERG ST	100	2%	1%
40	MADERIA-PACKET RD NWBD 200M N OF FINDLAY ST	95	2%	1%
41	WESTERN FWY WB OFFRAMP TO BACCHUS MARSH RD	92	2%	1%
43	BACCHUS MARSH RD W BD BTW GISBORNE RD & GELL ST	88	2%	1%
47	BACCHUS MARSH RD W BD BTW FISKEN ST & LORD ST	70	1%	1%
48	HEREFORD RD NWBD E OF ANDERSON ST ROUNDABOUT	69	1%	1%
50	PHILLIP ISLAND RD NWBD BTW BACK BEACH RD & RHYLL-NEWHAVEN RD	67	1%	1%
Total		5778	100%	55%

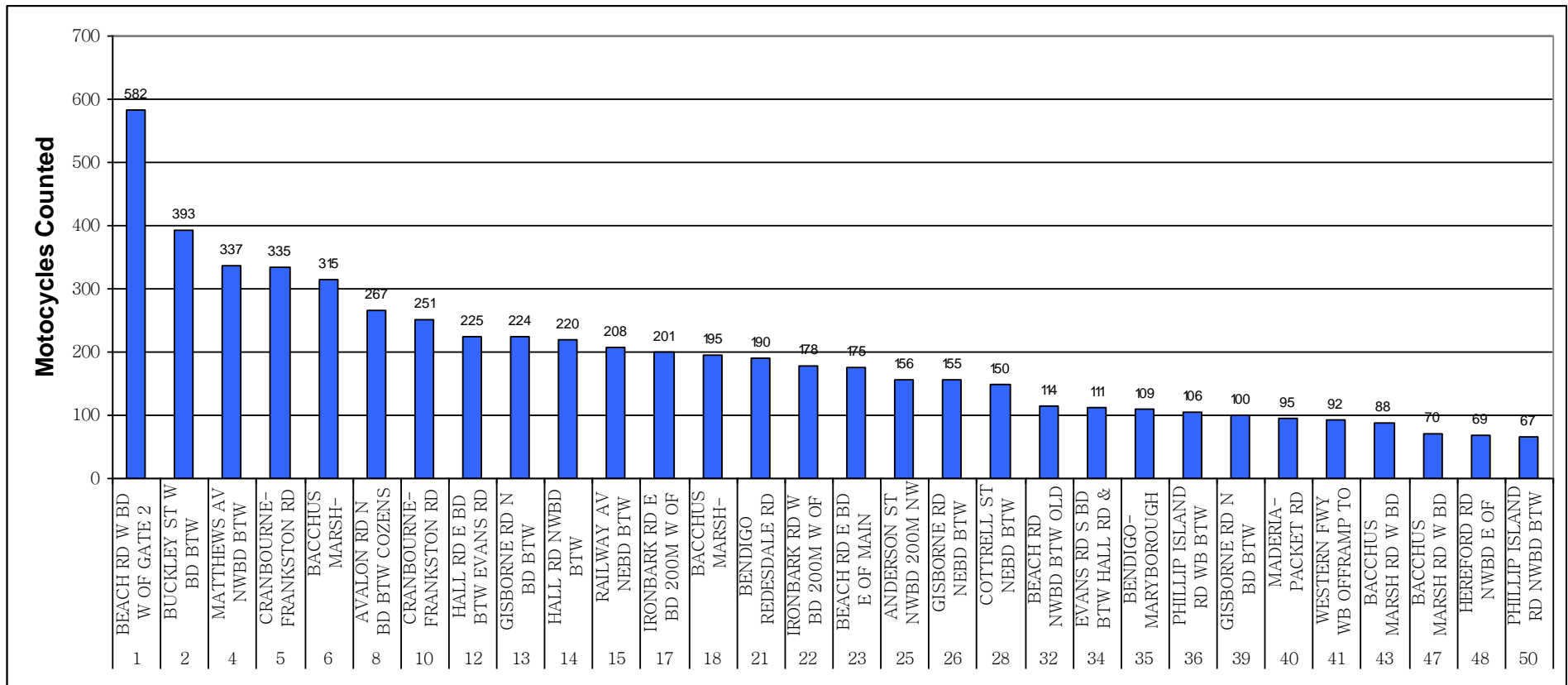


Figure 12 - Total number of motorcycles travelling through 60km/h zones collection points (2005)- Top 30

Table 8 - Top 22 within 80 km/h zones

Rank	Road Section	Count	% of Top 22 unique sites	% of all sites in 80 km/h
1	PHW ON RAMP NEBD NE OF BEACH RD	369	16%	9%
2	WESTERN PORT HWY N BD BTW CRANBOURNE-FRANKSTON RD & CARRBOYD RD	315	13%	8%
3	BACCHUS MARSH RD NWBD BTW WOOLPACK RD & WESTERN HWY	258	11%	7%
6	PHILLIP ISLAND RD E BD BTW CHURCHILL RD & @ 14KM POST	205	9%	5%
8	SHEPPARTON ALTERNATIVE ROUTE N BD 900M S OF MIDLAND HWY @ 3.1KM FROM SHEPPARTON	155	7%	4%
10	HENTY HWY N BD 700M S OF GARDEN ST (PORTLAND) @ 4.2KM FROM PORTLAND PORT	153	6%	4%
12	PHILLIP ISLAND RD W BD 400M E OF WOOLAMAI BEACH RD @ 2.6KM FROM SAN REMO	132	6%	3%
13	SHEPPARTON ALTERNATIVE ROUTE N BD 900M N OF MIDLAND HWY @ 2.9KM FROM SHEPPARTON	105	4%	3%
14	GRANT ST N BD BTW GRIFFITH ST & TAVERNER ST	88	4%	2%
15	GEELONG RD NEBD BTW WERRIBEE ST & GALVIN RD	87	4%	2%
16	KIEWA VALLEY HWY S BD 1.0KM S OF BRIGHT-TAWONGA RD @ 81.9KM FROM WODONGA	83	3%	2%
23	BACCHUS MARSH RD NWBD BTW PEARCE ST & WOOLPACK RD	59	2%	1%
25	AERODROME RD E BD 300M E OF SOMERTON PARK RD	48	2%	1%
27	DARGO RD W BD 100M W OF PRINCES HWY EAST @ 12.9KM FROM LINDENOW	43	2%	1%
28	PARWAN RD NWBD BTW MITCHEM ST & SOUTH MADDINGLEY RD	42	2%	1%
29	BACCHUS MARSH-GISBORNE RD NEBD BTW LERDERDERG GORGE RD & BUCKLEYS RD	41	2%	1%
30	BACCHUS MARSH-GEELONG RD SEBD BTW WOOLPACK RD & PARWAN-EXFORD RD	37	2%	1%
31	GRIFFITH ST E BD BTW FRANKLIN ST & GRANT ST	37	2%	1%
33	BACCHUS MARSH-GEELONG RD SEBD BTW FISKEN ST & VALENCE RD	36	2%	1%
34	WOOLPACK RD N BD BTW BACCHUS MARSH-GEELONG RD & PARWAN PARK RD	33	1%	1%
37	KIEWA EAST RD E BD 900M E OF KIEWA VALLEY HWY @ 0.9KM FROM KIEWA	25	1%	1%
40	DIGGERS REST-COIMADAI RD W BD BTW BENCES RD & QUARRY HAUL RD	23	1%	1%
Total		2374	100%	60%

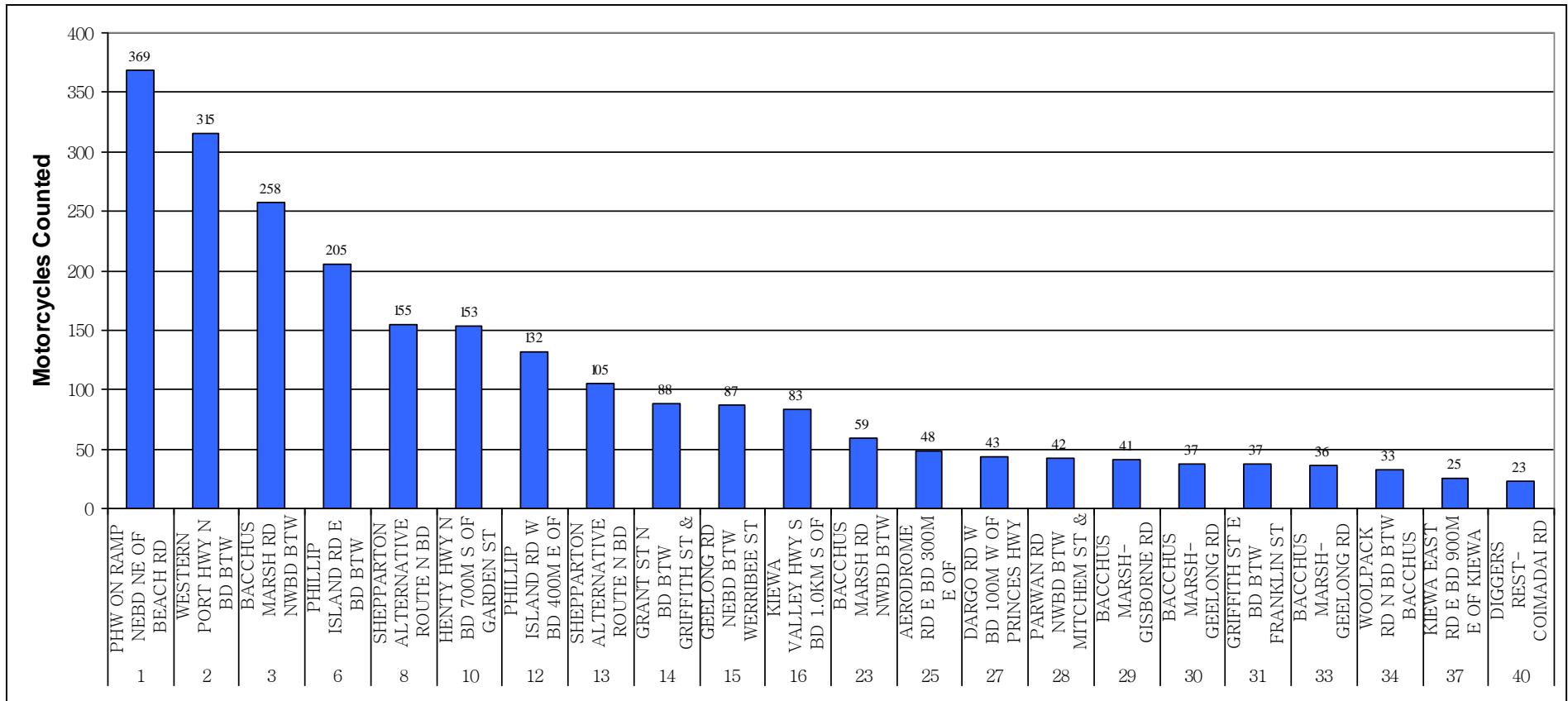


Figure 13 - Total number of motorcycles travelling through 80km/h zones collection points (2005)- All 22 unique sites

Table 9 - Top 30 sites within 100 km/h zones

Rank	Road Section	Count	% of Top 30 unique sites	% of all sites in 100 km/h
1	MAROONDAH HWY S BD 1.4 KM S OF MARYSVILLE RD @ 83.9KM FROM MELBOURNE	900	12.6%	6%
3	MELBA HWY N BD 1.4 KM N OF KINGLAKE RD @ 67.9KM FROM NORTH OF MELBOURNE	585	8.2%	4%
4	MAROONDAH HWY S BD 2.3KM N OF YARCK RD @146.2KM FROM MELBOURNE	572	8.0%	4%
6	MELBA HWY S BD 1.4 KM N OF KINGLAKE RD @ 67.9KM FROM NORTH OF MELBOURNE	466	6.5%	3%
7	MAROONDAH HWY S BD 800M S OF YARCK RD @143.3KM FROM MELBOURNE	427	6.0%	3%
9	MAROONDAH LINK HWY S BD 2.1KM N OF GOULBURN VALLEY HWY @ 56.9KM FROM SEYMOUR	334	4.7%	2%
11	MELBA HWY N BD 1.4 KM N OF LANGS RD @100.0KM FROM MELBOURNE	302	4.2%	2%
12	GOULBURN VALLEY HWY W BD 600M E OF LIMESTONE RD @ 41.3KM FROM SEYMOUR	282	3.9%	2%
13	MELBA HWY S BD 1.4 KM N OF LANGS RD @100.0KM FROM MELBOURNE	263	3.7%	2%
14	MAROONDAH HWY N BD 1.5 KM S OF WHANREGARWEN RD @124.0KM FROM MELBOURNE	235	3.3%	1%
15	MAROONDAH HWY S BD 100M S OF SPRING CREEK RD @135.0KM FROM MELBOURNE	227	3.2%	1%
17	GOULBURN VALLEY HWY E BD 600M E OF LIMESTONE RD @ 41.3KM FROM SEYMOUR	209	2.9%	1%
18	GREAT OCEAN RD NEBD 400M W OF COALMINE CREEK	196	2.7%	1%
19	CALDER HWY S BD 1KM N OF OLYMPIC PDE @157.0KM FROM MELBOURNE	185	2.6%	1%
20	GOULBURN VALLEY HWY W BD 200M W OF GHIN GHIN RD @ 35.0KM FROM SEYMOUR	168	2.4%	1%
21	MAROONDAH HWY E BD 1.4 KM E OF MIDLAND LINK HWY @187.0KM FROM MELBOURNE	156	2.2%	1%
23	MAROONDAH HWY E BD 600M E OF PYKES RD @193.6KM FROM MELBOURNE	152	2.1%	1%
24	GISBORNE-MELTON RD N BD 1.6 KM S OF COUANGALT RD @ 8.1KM FROM GISBORNE	143	2.0%	1%
25	DIGGERS REST-COIMADAI RD WB .4KM W OF HJORTHS RD	135	1.9%	1%
28	MIDLAND HWY N BD 3.1 KM N OF MIDLAND LINK HWY @ 45.2KM FROM BENALLA	131	1.8%	1%
29	BROADFORD-KILMORE RD W BD 4.3 KM E OF NORTHERN HWY @ 10.1KM FROM BROADFORD	129	1.8%	1%
32	WHITFIELD MANSFIELD RD S BD 100M N OF CARLISLE HILL RD @ 3.9KM FROM MANSFIELD	121	1.7%	1%
36	MELBOURNE-LANCEFIELD RD N BD 300M N OF GISBORNE-KILMORE RD @ 14.0KM FROM LANCEFI	115	1.6%	1%
37	SOUTH GIPPSLAND HWY W BD 400M W OF HOOKERS RD @ 91.4KM FROM MELBOURNE	115	1.6%	1%
38	BASS HWY W BD BTW DENSLEY RD & MOUTH OF POWLETT RD	114	1.6%	1%
41	CALDER HWY E BD 300M W OF HERMITAGE RD @159.3KM FROM MELBOURNE	107	1.5%	1%
42	SOUTH GIPPSLAND HWY SWBD 200M SE OF SOUTH RD @106.9KM FROM MELBOURNE	102	1.4%	1%
44	PHILLIP ISLAND RD N BD 500M S OF VENTNOR RD @ 2.5KM FROM COWES	96	1.3%	1%
46	SOUTH GIPPSLAND HWY NWBD 200M SE OF SOUTH RD @106.9KM FROM MELBOURNE	89	1.2%	1%
48	PRINCES HWY EAST S BD BTW MYRTLEBANK RD & YUILL RD	87	1.2%	1%
Total		7143	100.0%	44%

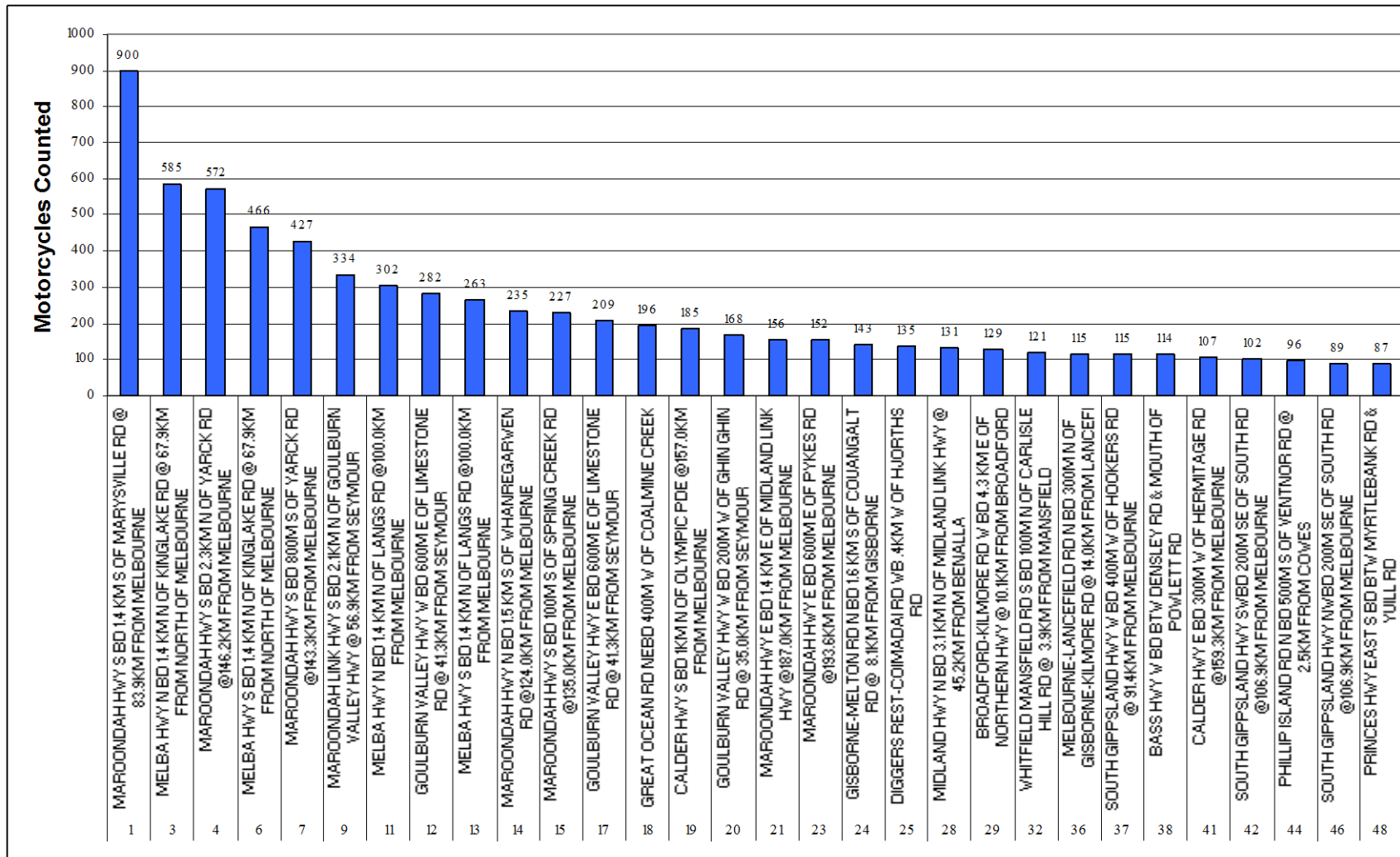


Figure 14 - Total number of motorcycles travelling through 100km/h zones collection points (2005)- Top 30

60 km/h

Table 7 and Figure 12 present the top 30 within the 60 km/h zone. Beach Road recorded the highest motorcycle volumes with 582 motorcycles. The numbers through the ranked sites reduce quite rapidly, the site ranked number 30, Phillip Island Road recording only 67 motorcycles passing through it. Other sections in the total list of 60 km/h sites include, Buckley Street, Cranbourne-Frankston Road, Western Freeway off ramp, Princes Highway East, South Gippsland Highway, and the Great Alpine Road.

80 km/h

Highly travelled sites within the 80 km/h routes are presented in Table 8 and Figure 13. The onramp of Princes Highway West, north east of Beach Road, on the northeast bound carriageway recorded the highest volumes within the 80 km/h zone, 369 or around 9% of the volumes within the 80 km/h sections. Other notable sites included sections along Phillip Island Road, Western Port Highway, Henty Highway, and Geelong Road. As there were only 22 unique sites zoned 80 km/h, all sites have been included in the list. The volumes across the sites experienced a gradual decline.

100 km/h

Table 9 and Figure 14 present the top 30 sites within the 100 km/h road sections. Of the collection sites within 100 km/h road sections, the southbound carriageway of Maroondah Highway, 1.4 km south of Marysville and 83.9 km from Melbourne ranked the highest, with 900 motorcycles recorded. This is also the highest ranked site overall. With considerably lower volumes, Melba Highway, 67.9 km from Melbourne, and Maroondah Highway, 146.2 km from Melbourne follow, with 585 and 572 motorcycles passing through the sites. The volumes reduce rapidly at subsequent sites, with rank 30, Princes Highway East having less than 10% of the volumes of rank 1.

A lot of the sites in the top 30 are highway or freeways, including Goulburn Valley Highway, ranked 12, and Calder Highway, 19. Other notable sites within the total list included Great Ocean Road ranked 18, Phillip Island Road near Cowes, ranked 44, Great Alpine Road, 140

3.1.5 Speed Limit Adherence

The following section presents overall speed statistics for motorcycles, for the different speed zones, including minimum and maximum speeds recorded for each speed limit and mean speeds.

40 km/h Speed Zone

speed		
N	Valid	231.0
	Missing	.0
Mean		53.6
Median		52.1
Std. Deviation		12.2
Range		75.0
Minimum		20.4
Maximum		95.4
Percentiles	85	64.5

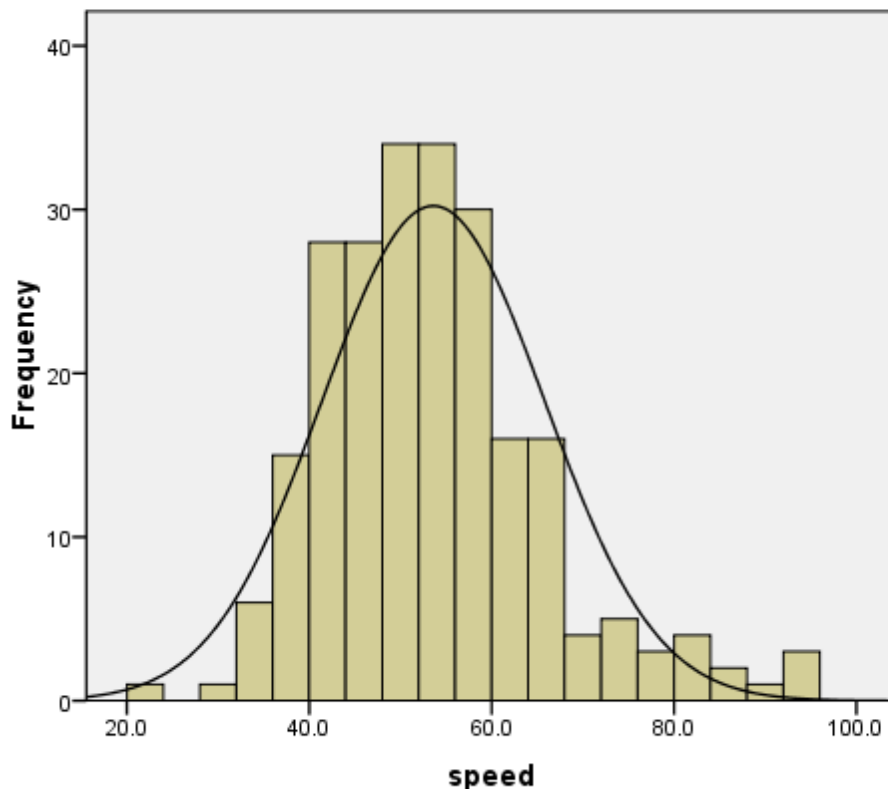


Figure 15 - Speed Distribution for 40 km/h

On roads zoned 40 km/h, the mean speed for motorcyclists was 53.6 km/h, with the 85th percentile of the 231 recorded motorcycles travelling at 64.5 km/h. A maximum speed of 95.4 km/h was recorded in this speed zone.

50 km/h Speed Zone

speed		
N	Valid	888.0
	Missing	.0
Mean		64.1
Median		62.6
Std. Deviation		17.0
Range		123.1
Minimum		10.6
Maximum		133.7
Percentiles	85	82.1

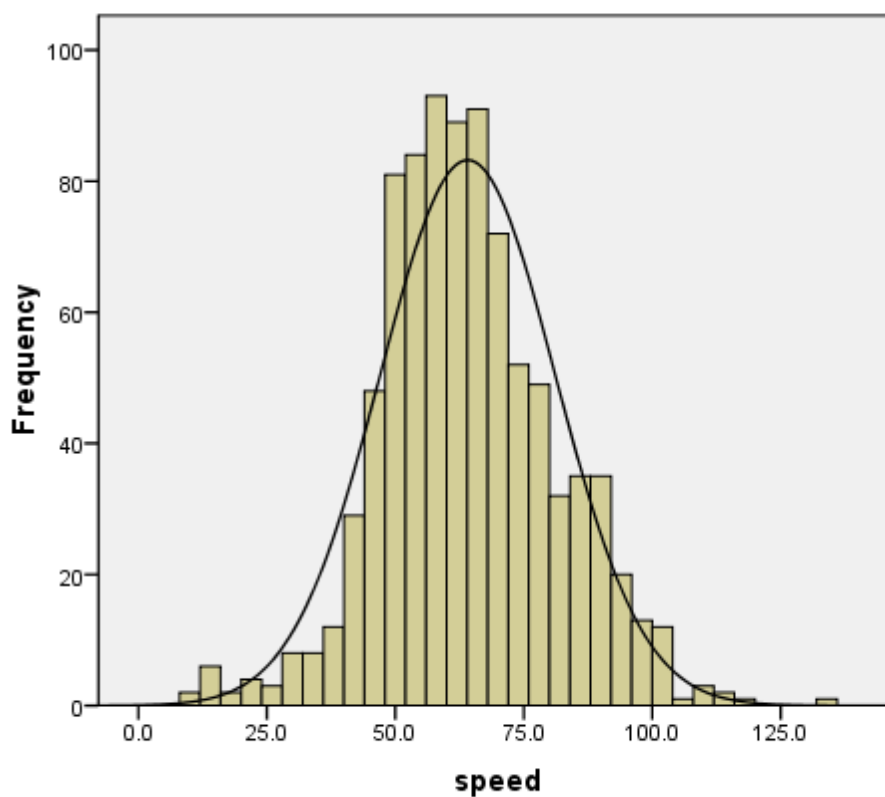


Figure 16 - Speed Distribution for 50 km/h

Within road sections zoned 50 km/h, the mean speed of motorcyclists was 64.1 km/h. Of a sample size of 888, the 85th percentile was 82.1 km/h and the maximum speed was 133.7 km/h.

60 km/h Speed Zone

speed		
N	Valid	10477.0
	Missing	.0
Mean		64.1
Median		62.3
Std. Deviation		20.2
Range		148.3
Minimum		10.2
Maximum		158.5
Percentiles	85	83.9

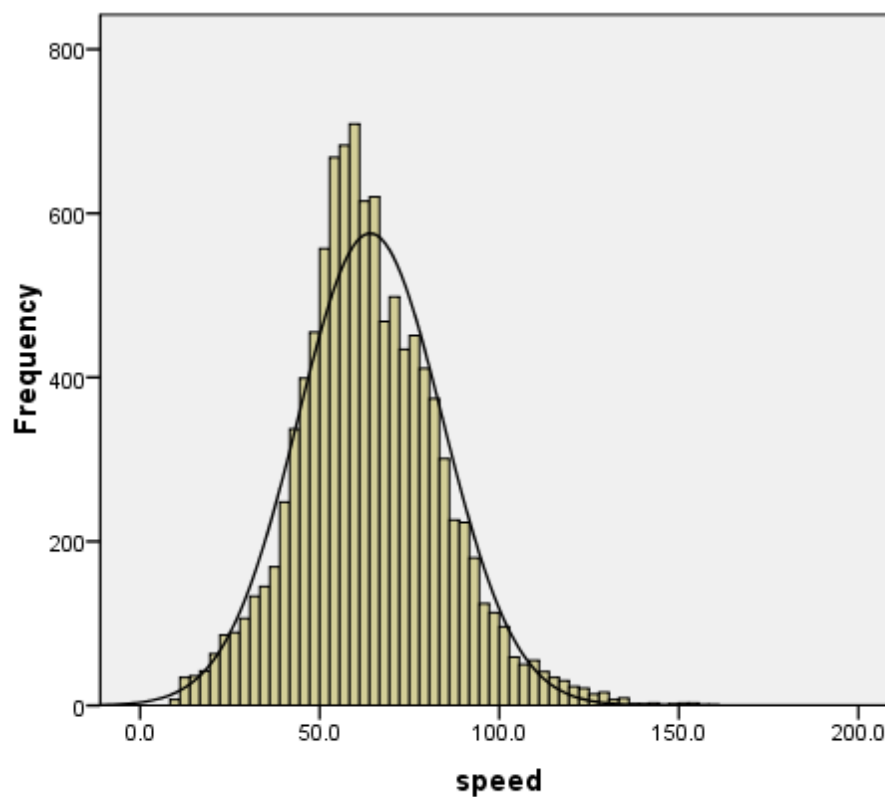


Figure 17 - Speed Distribution for 60 km/h

The mean speed of motorcyclists within 60 km/h zones was 64.1 km/h, and the 85th percentile of a sample size of 10,477 was 83.9 km/h. A maximum speed of 158.5 km/h was recorded in this speed zone.

70 km/h Speed Zone

speed		
N	Valid	88.0
	Missing	.0
Mean		62.1
Median		65.3
Std. Deviation		17.3
Range		100.6
Minimum		16.1
Maximum		116.7
Percentiles	85	74.7

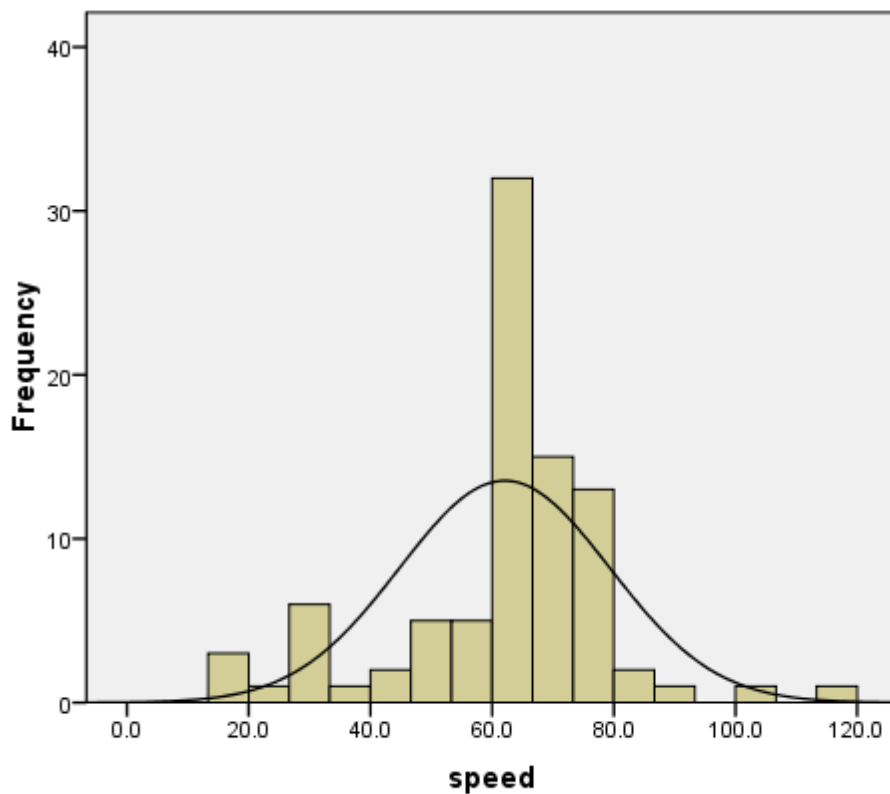


Figure 18- Speed Distribution for 70 km/h

The mean speed of motorcyclists within 70 km/h zones was 62.1 km/h, with 85th percentile of the 88 riders travelling at 74.7 km/h. The maximum speed recorded was 116.7 km/h.

80 km/h Speed Zone

speed		
N	Valid	3953.0
	Missing	.0
Mean		72.5
Median		73.9
Std. Deviation		21.6
Range		143.4
Minimum		10.3
Maximum		153.7
Percentiles	85	93.8

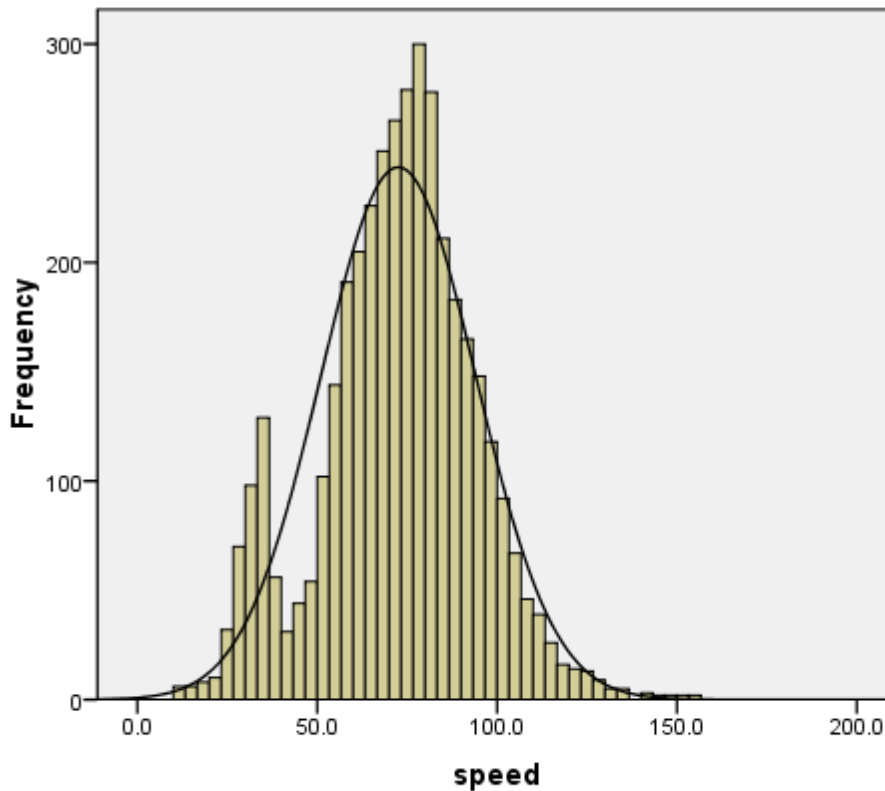


Figure 19 - Speed Distribution for 80 km/h

The mean speed of motorcyclists within 80 km/h zones was 72.5 km/h, with an 85th percentile speed of 93.8 km/h based on a sample size of 3,953. A maximum speed of 153.7 km/h was recorded.

100 km/h Speed Zone

speed		
N	Valid	16310.0
	Missing	.0
Mean		99.2
Median		99.5
Std. Deviation		16.2
Range		147.2
Minimum		11.4
Maximum		158.6
Percentiles	85	112.8

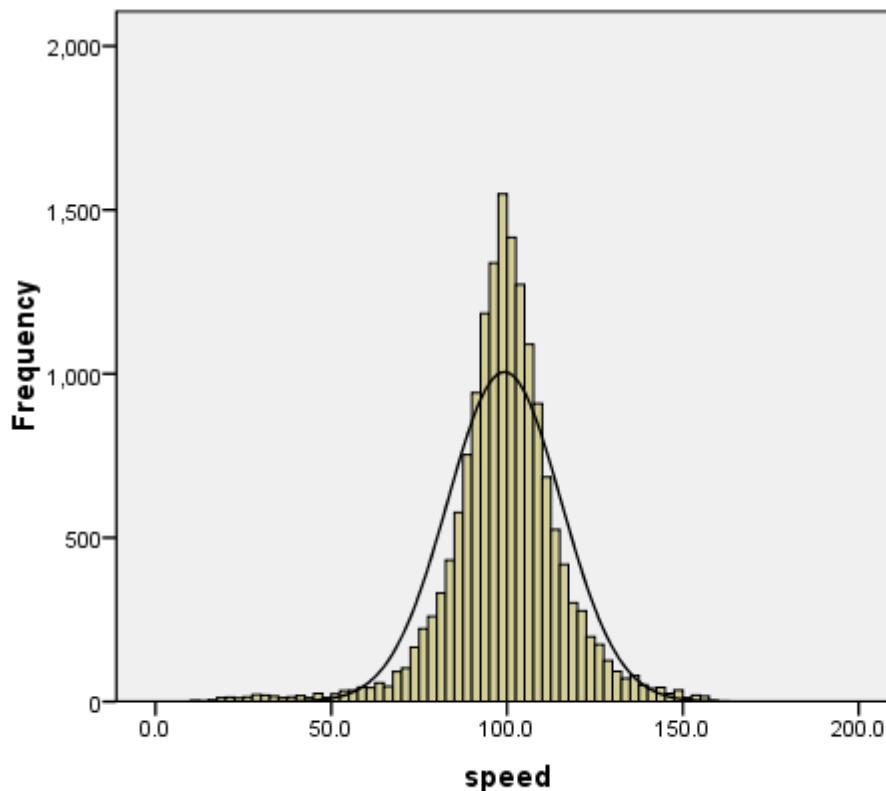


Figure 20 - Speed Distribution for 100 km/h

The mean speed of motorcyclists within 100 km/h zones was 99.2 km/h, and an 85th percentile speed of 112.8 km/h, based on a sample size of 16,310. A maximum of 158.6 km/h was recorded.

3.1.6 Level of Speeding

As both speed zone and actual speed were provided for each motorcycle counted in the data separately provided for 2005 motorcycle counts, it is possible to determine that 50% of the motorcycles counted were exceeding the posted speed limit. Speeding was most likely in the lowest speed zone with 90% of motorcycles exceeding the posted speed limit of 40 km/h, with the proportion decreasing for 60 km/h speed zones. Adherence to the limit was most likely in 70 km/h speed zones (with 72% adherence), though it noted that this sample size is smaller than those for other speed zones. Again the proportion exceeding the speed limit increased to nearly 50% in 100 km/h (Figure 21).

Table 10 - Summary of speed characteristics across speed zones

Speed zone	Mean (km/h)	Median (km/h)	Std Dev (km/h)	Maximum (km/h)	85 th percentile (km/h)	% exceeding speed limit
40 km/h	54	52	12	95	65	90
50 km/h	64	63	17	134	82	82
60 km/h	64	62	20	159	84	55
70 km/h	62	65	17	117	75	28
80 km/h	73	74	22	154	94	36
100 km/h	99	100	16	159	113	48

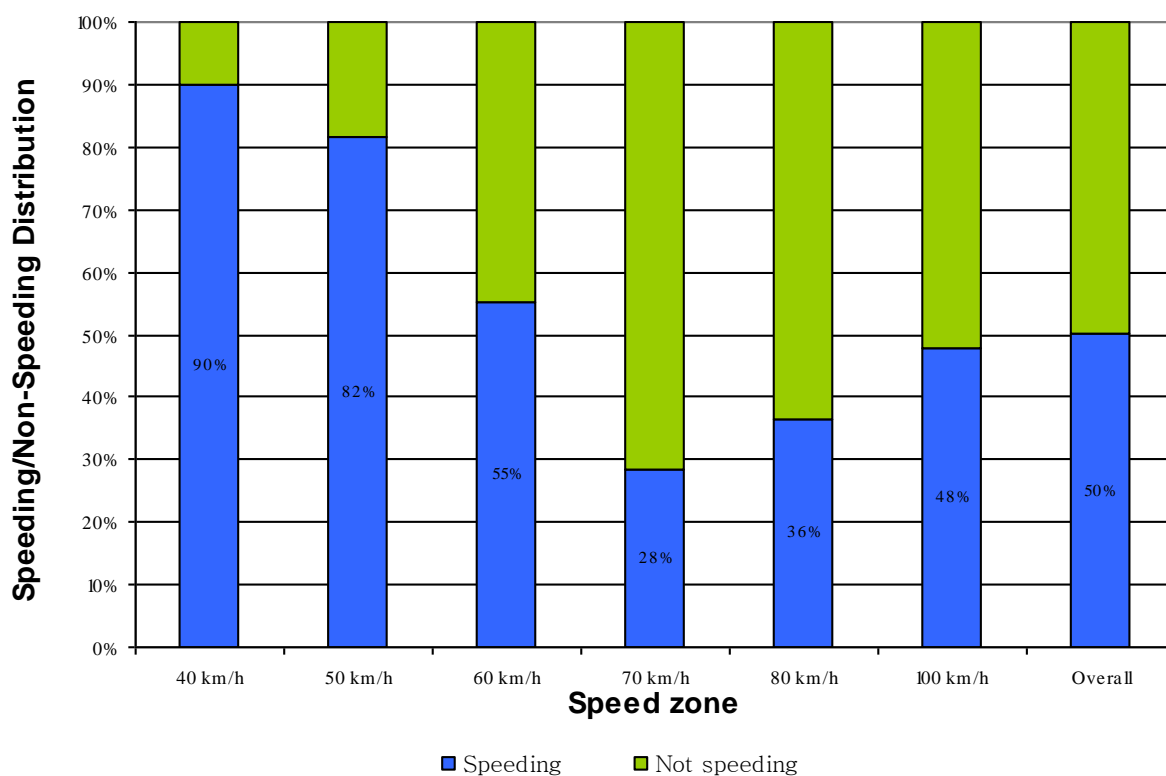


Figure 21 – Proportions of speeding riders across speed zones

With respect to travel purpose, Figure 22 indicates that around 50% of motorcyclists have exceeded the speed limit while commuting, slightly less during business hours and leisure riding, showed the greatest likelihood of speeding (55%).

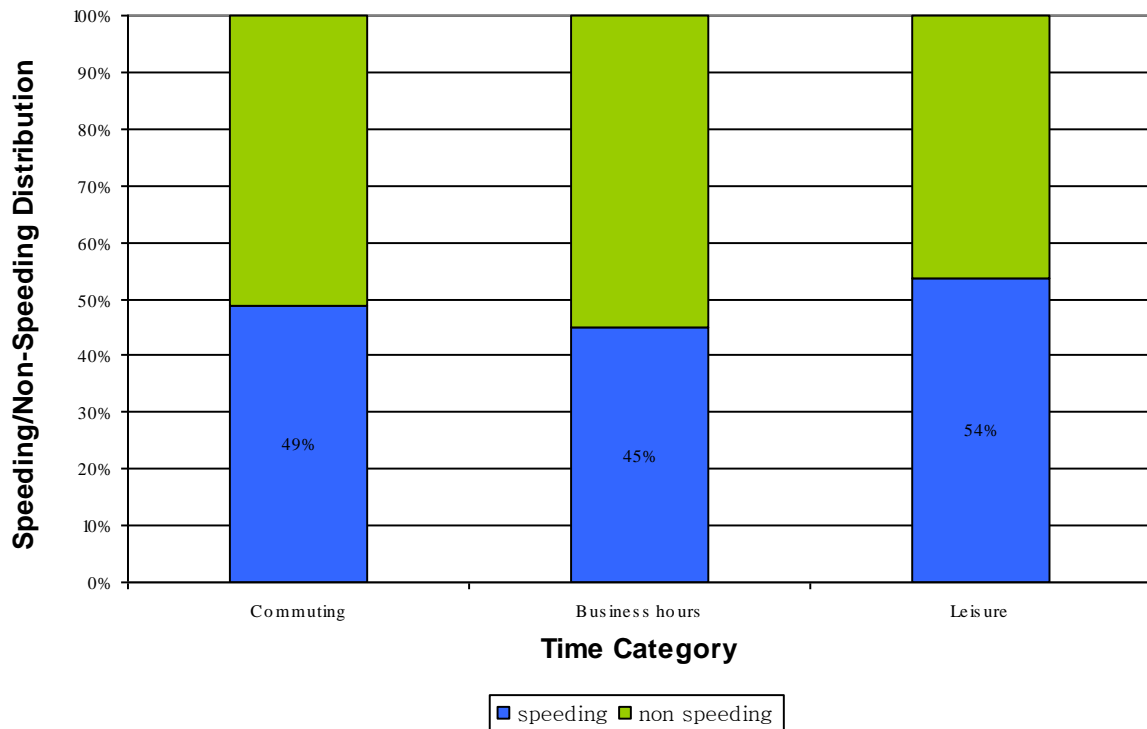


Figure 22 - Travel purpose based speeding distribution

This proportion of speeding riders appears to apply generally across the day regardless of the hour, with the likelihood of speeding being lowest around mid morning and highest in the late hours of the night (Figure 23).

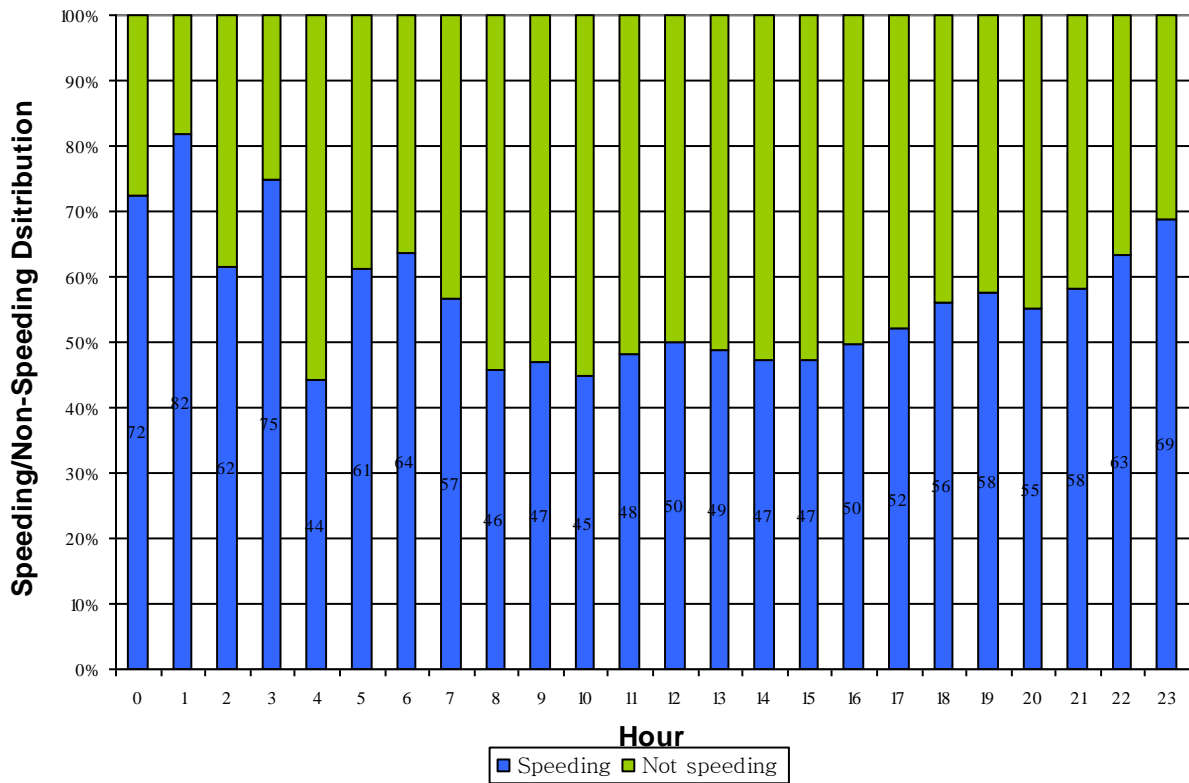


Figure 23 – Time-based speeding propensity

There appears to be a slightly higher propensity to speed in metro areas when compared to rural areas (54% compared with 48%) (Figure 24).

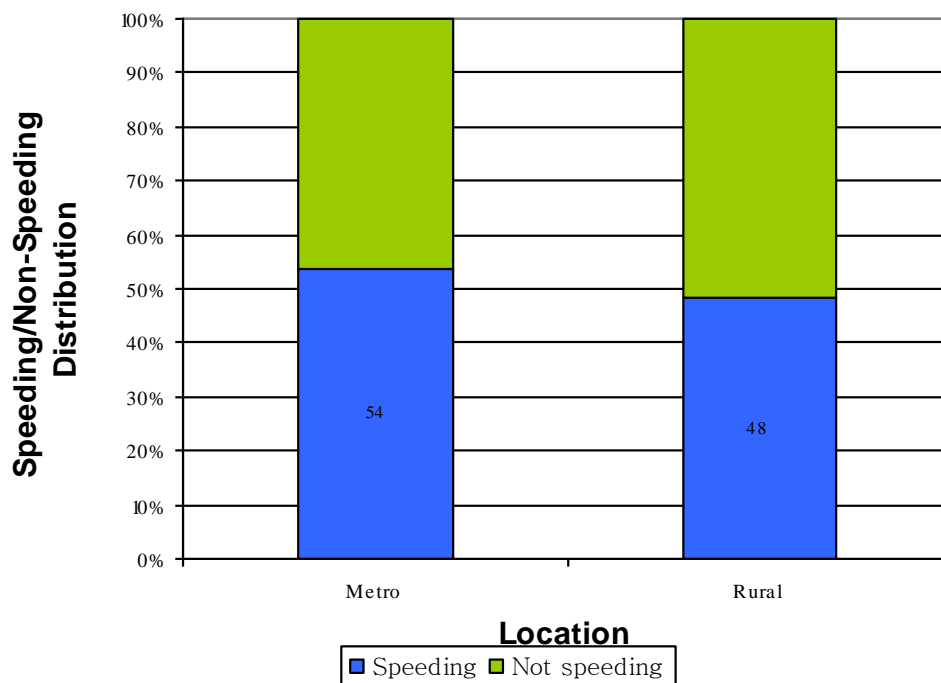


Figure 24 - Metro/rural comparison of speeding propensity

3.2 COMPARISON WITH ALL VEHICLES

3.2.1 Overall Site Rank

In order to establish the relative popularity of the motorcycle sites with all vehicle sites, a list of ranked sites of most travelled routes of motorcyclists was compiled (see Table 11) for comparison with the corresponding rankings of the sites for all vehicles (see Table 12). For each listed site, these tables indicate whether the location was in a metropolitan or rural area (Metro/Rural), the number of motorcycles (“MC No”) and all other vehicles counted (“All Veh No”), and the relative ranking for each site in terms of the number of units counted, (“MC site rank” and “All site rank”). Thus it is possible to ascertain whether significant motorcycling locations are also busy sites for all vehicles. The tables were based on the 2004-2006 dataset to aid more accurate comparison between all vehicles and motorcycles and hence the sites highlighted and the ranking are somewhat different from the sites highlighted earlier in the motorcycle analysis section. As mentioned in the methodology, each row in the table is a count-location site and so some popular sites are duplicated in both Table 11 and 12. Unlike in Section 1, duplicates were not excluded as the purpose here is to compare with all vehicles site ranking rather than highlighting prominent motorcycle routes per se.

Table 11 Top 50 motorcycle sites with corresponding ranking for all vehicles

Description	Metro/Rural	MC No	MC site rank	All Veh No	All site rank
Princes Hwy East S Bd Btw Myrtlebank Rd & Yuill Rd	R	836	1	3621	2198
Princes Hwy East W Bd Btw Sale-Heyfield Rd & Polocross La	R	722	2	3905	1965
Princes Hwy East S Bd Btw Myrtlebank Rd & Yuill Rd	R	458	3	3811	2028
Princes Hwy East W Bd Btw Sale-Heyfield Rd & Polocross La	R	341	4	4145	1770
Beach Rd W Bd W Of Gate 2	M	253	5	5905	901
Maroondah Hwy S Bd 1.4 Km S Of Marysville Rd @ 83.9km From Melbourne	R	208	6	2139	4149
Maroondah Hwy S Bd 1.4 Km S Of Marysville Rd @ 83.9km From Melbourne	R	192	7	3177	2638
Phw On Ramp Nebd Ne Of Beach Rd	M	183	8	3633	2192
Princes Hwy East S Bd Btw Myrtlebank Rd & Yuill Rd	R	172	9	3179	2632
Maroondah Hwy N Bd 1.4 Km S Of Marysville Rd @ 83.9km From Melbourne	R	156	10	1252	6701
Maroondah Hwy N Bd 1.4 Km S Of Marysville Rd @ 83.9km From Melbourne	R	155	11	1239	6755
Healesville-Kinglake Rd W Bd 700m E Of Melba Hwy @ 27.1km Post	R	143	12	396	11567
Maroondah Hwy S Bd 800m S Of Yarck Rd @ 143.3km From Melbourne	R	140	13	4837	1364
Maroondah Hwy S Bd 2.3km N Of Yarck Rd @ 146.2km From Melbourne	R	130	14	4663	1444
Maroondah Hwy N Bd 2.3km N Of Yarck Rd @ 146.2km From Melbourne	R	125	15	3886	1982
Melba Hwy N Bd 1.4 Km N Of Kinglake Rd @ 67.9km From North Of Melbourne	R	125	16	1947	4548
Maroondah Hwy N Bd 1.4 Km S Of Marysville Rd @ 83.9km From Melbourne	R	118	17	1555	5601
Maroondah Hwy S Bd 1.4 Km S Of Marysville Rd @ 83.9km From Melbourne	R	116	18	1048	7720
Princes Hwy East E Bd Btw Sale-Heyfield Rd & Polocross La	R	111	19	3569	2246
Princes Hwy East N Bd Btw Myrtlebank Rd & Yuill Rd	R	111	20	3089	2738
Melba Hwy N Bd 1.4 Km N Of Kinglake Rd @ 67.9km From North Of Melbourne	R	110	21	4700	1423
Avalon Rd S Bd Btw Cozens Rd & Coonawarra Dr	M	109	22	4722	1405
Princes Hwy East N Bd Btw Myrtlebank Rd & Yuill Rd	R	109	23	2836	3091
Maroondah Hwy S Bd 1.4 Km S Of Marysville Rd @ 83.9km From Melbourne	R	107	24	1856	4767
Bendigo-Murchison Rd E Bd 300m E Of Heathcote-Rochester Rd @ 54.1km From Bendigo	R	107	25	482	10958
Healesville-Kinglake Rd E Bd 700m E Of Melba Hwy @ 27.1km Post	R	107	26	465	11055
Maroondah Link Hwy S Bd 2.1km N Of Goulburn Valley Hwy @ 56.9km From Seymour	R	106	27	4295	1645
Healesville-Kinglake Rd E Bd 6.5 Km W Of Melba Hwy @ 6.2km From Kinglake	R	104	28	573	10380
Maroondah Link Hwy N Bd 2.1km N Of Goulburn Valley Hwy @ 56.9km From Seymour	R	103	29	3542	2278
Beach Rd W Bd W Of Gate 2	M	101	30	5577	1038
Avalon Rd N Bd Btw Cozens Rd & Coonawarra Dr	M	100	31	4933	1309
Maroondah Hwy N Bd 1.4 Km S Of Marysville Rd @ 83.9km From Melbourne	R	100	32	1408	6134
Cranbourne-Frankston Rd Swbd Btw Hall Rd & Scarborough Av	M	99	33	9557	198
Great Ocean Rd Nebd 400m W Of Coalmine Creek	R	99	34	2019	4387
Healesville-Kinglake Rd E Bd 700m E Of Melba Hwy @ 27.1km Post	R	99	35	441	11247
Princes Hwy East W Bd Btw Sale-Heyfield Rd & Polocross La	R	97	36	3596	2214
Healesville-Kinglake Rd W Bd 6.5 Km W Of Melba Hwy @ 6.2km From Kinglake	R	97	37	576	10364
Maroondah Hwy N Bd 800m S Of Yarck Rd @ 143.3km From Melbourne	R	95	38	4087	1819
Phillip Island Rd E Bd Btw Churchill Rd & @ 14km Post	R	93	39	5506	1064
Healesville-Kinglake Rd W Bd 700m E Of Melba Hwy @ 27.1km Post	R	93	40	371	11702
Melba Hwy S Bd 1.4 Km N Of Kinglake Rd @ 67.9km From North Of Melbourne	R	91	41	5442	1091
Melba Hwy S Bd 1.4 Km N Of Kinglake Rd @ 67.9km From North Of Melbourne	R	91	42	3351	2464
Beach Rd W Bd W Of Gate 2	M	90	43	5735	964
Maroondah Hwy N Bd 2.3km N Of Yarck Rd @ 146.2km From Melbourne	R	87	44	1420	6089
Whittlesea-Yea Rd N Bd 4.1 Km S Of Goulburn Valley Hwy @ 4.1km Post	R	86	45	472	11008
Beach Rd E Bd W Of Gate 2	M	85	46	4524	1513
Cranbourne-Frankston Rd Nebd Btw Hall Rd & Scarborough Av	M	84	47	8994	245
Yarra Bvd Nebd 500m Sw Of Yarra St	M	84	48	1006	7943
Maroondah Hwy S Bd 1.4 Km S Of Marysville Rd @ 83.9km From Melbourne	R	83	49	2019	4388
Princes Hwy East W Bd 300m E Of Airport Rd @ 156.4km Post	R	82	50	13208	36

Table 12 Top 50 all vehicle sites with corresponding ranking for motorcycles

Description	Metro/Rural	Num all	All rank	Num MC	MC site rank
Sherbourne Rd Sebd Se Of Karingal Dr	M	16925	1	39	352
Sherbourne Rd Nwbd Se Of Karingal Dr	M	16891	2	37	407
Sherbourne Rd Sebd Se Of Karingal Dr	M	16624	3	47	209
Sherbourne Rd Nwbd Se Of Karingal Dr	M	16596	4	32	580
Para Rd Nwbd Se Of Paterson Cr	M	16585	5	37	408
Para Rd Sebd Se Of Paterson Cr	M	16349	6	48	200
Para Rd Nwbd Se Of Paterson Cr	M	16170	7	34	510
Para Rd Sebd Se Of Paterson Cr	M	15983	8	27	851
Sherbourne Rd Sebd Se Of Karingal Dr	M	15958	9	22	1221
Para Rd Sebd Se Of Paterson Cr	M	15942	10	53	147
Sherbourne Rd Nwbd Se Of Karingal Dr	M	15932	11	29	733
Para Rd Nwbd Se Of Paterson Cr	M	15839	12	37	409
Para Rd Sebd Se Of Paterson Cr	M	15690	13	28	788
Sherbourne Rd Nwbd Se Of Karingal Dr	M	15671	14	26	918
Sherbourne Rd Sebd Se Of Karingal Dr	M	15545	15	28	789
Para Rd Nwbd Se Of Paterson Cr	M	15301	16	23	1134
Sherbourne Rd Nwbd Se Of Karingal Dr	M	15244	17	17	1871
Sherbourne Rd Sebd Se Of Karingal Dr	M	15157	18	25	980
Para Rd Sebd Se Of Paterson Cr	M	15099	19	28	790
Cranbourne-Frankston Rd E Bd W Of Scott St	M	14836	20	48	201
Para Rd Nwbd Se Of Paterson Cr	M	14751	21	19	1561
Para Rd Sebd Se Of Paterson Cr	M	14629	22	30	677
Cranbourne-Frankston Rd Nebd Btw Hall Rd & Scarborough Av	M	14501	23	53	148
Para Rd Nwbd Se Of Paterson Cr	M	14410	24	22	1222
Sherbourne Rd Sebd Se Of Karingal Dr	M	14403	25	25	981
Para Rd Sebd Se Of Paterson Cr	M	14226	26	23	1135
Sherbourne Rd Nwbd Se Of Karingal Dr	M	14092	27	30	678
Anderson St Nwbd 200m Nw Of Alfred Rd	M	13963	28	17	1872
Cranbourne-Frankston Rd E Bd W Of Scott St	M	13706	29	31	625
Anderson St Sebd 200m Nw Of Alfred Rd	M	13531	30	16	2046
Heatherton Rd W Bd Btw Stud Rd & Monash Fwy	M	13427	31	36	438
Cranbourne-Frankston Rd Nebd Btw Hall Rd & Scarborough Av	M	13396	32	47	210
Anderson St Nwbd 200m Nw Of Alfred Rd	M	13339	33	27	852
Para Rd Nwbd Se Of Paterson Cr	M	13325	34	25	982
Para Rd Sebd Se Of Paterson Cr	M	13276	35	18	1710
Princes Hwy East W Bd 300m E Of Airport Rd @156.4km Post	R	13208	36	82	50
Anderson St Sebd 200m Nw Of Alfred Rd	M	13160	37	23	1136
Cranbourne-Frankston Rd Swbd Btw Hall Rd & Scarborough Av	M	13128	38	51	171
Princes Hwy East E Bd 300m E Of Airport Rd @156.4km From Melbourne	R	13047	39	53	149
Anderson St Nwbd 200m Nw Of Alfred Rd	M	12889	40	20	1428
Anderson St Nwbd 200m Nw Of Alfred Rd	M	12869	41	29	734
Cranbourne-Frankston Rd Swbd Btw Hall Rd & Scarborough Av	M	12866	42	33	542
Anderson St Nwbd 200m Nw Of Alfred Rd	M	12821	43	32	581
Plenty Rd Nebd Sw Of Mcglynn Av	M	12770	44	42	295
Anderson St Sebd 200m Nw Of Alfred Rd	M	12743	45	14	2461
Princes Hwy East W Bd 300m E Of Airport Rd @156.4km Post	R	12672	46	39	353
Anderson St Nwbd 200m Nw Of Alfred Rd	M	12670	47	13	2709
Metropolitan Ring Rd On Ramp W Bd Btw Dalton Rd & High St	M	12586	48	45	232
Anderson St Sebd 200m Nw Of Alfred Rd	M	12584	49	29	735
Cranbourne-Frankston Rd Nebd Btw Hall Rd & Scarborough Av	M	12560	50	33	543

Tables 11 and 12 establish that sites popular with motorcyclists are generally not the sites that carry a lot of general traffic. Princes Highway East near Airport Road, was the only site that had a top-50 ranking in both the motorcycle and all vehicles list. The top 50 motorcycle sites represent 6.2% of the motorcycles counted (and 0.6% of all vehicles counted at those sites), while the top 50 all vehicle sites represent 2.6% of all vehicles counted (and 1.3% of motorcycles counted at those sites).

3.2.2 Location

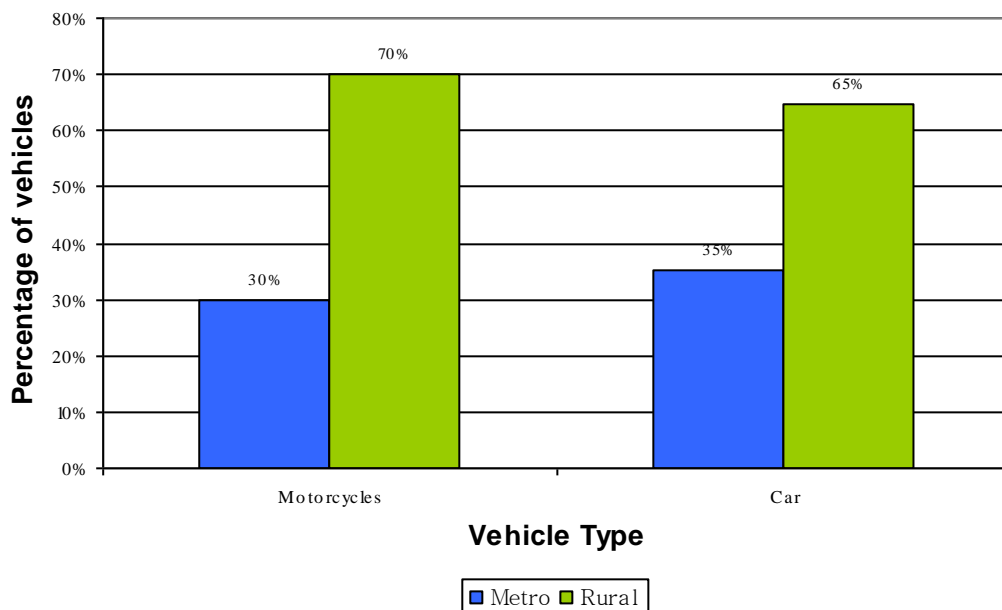


Figure 25 - Proportions of Motorcycle Volumes compared to All Vehicles - Location Comparison

Figure 25 shows the proportion of motorcycles and other vehicles (“cars”), counted at metropolitan and rural sites. In both location categories a greater number of units were counted at rural sites, however the differential bias was greater for motorcycles. That is, there appears to be a larger proportion of motorcycles in rural areas, than in metropolitan areas. Around 10 million vehicles were recorded in the metropolitan areas and 16 million in the rural areas. Motorcycle counts were around 35,000 for metropolitan regions (0.35% of all vehicles) and around 85,000 in rural (0.53%). This difference could be explained by the lower levels of congestion along rural roads and the nature of roads in rural areas, bends and pleasant scenery being more conducive to leisure travel. These roads are generally zoned at higher speeds, allowing a greater thrill for the leisure riders. Again, the number of data collection sites in rural and metropolitan areas is also influential.

3.2.3 Time of year

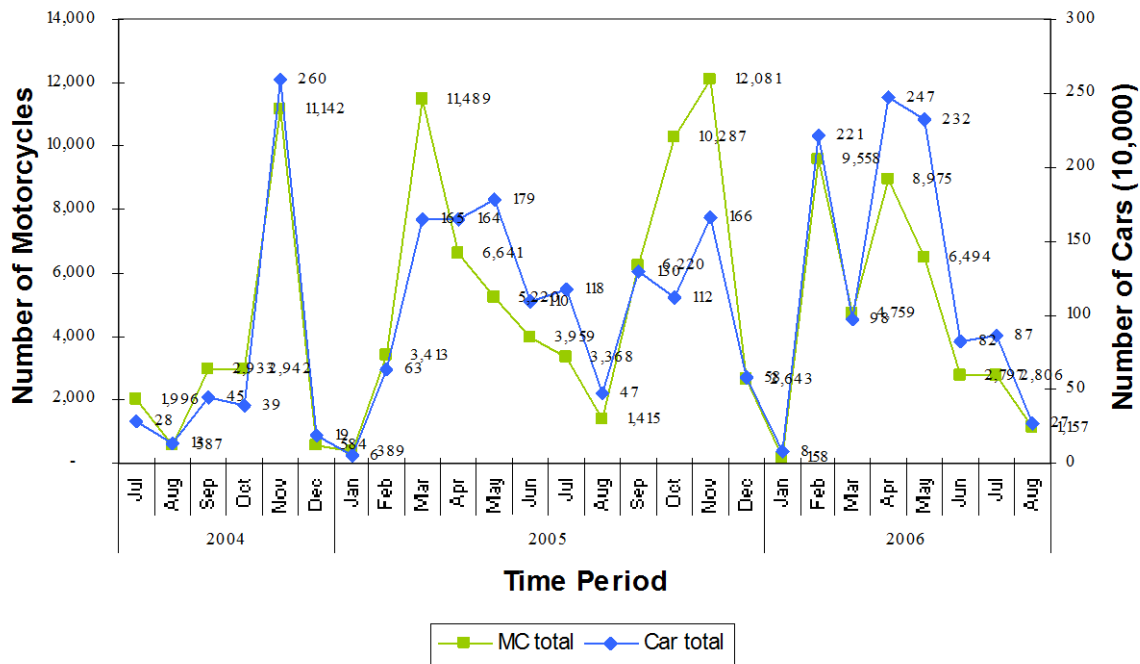


Figure 26 - Motorcycles vs All Vehicles Time of Year Comparison

Figure 26 provide a comparison of motorcycles and all vehicle counts throughout the year. There would seem to be recurring spikes in the number of vehicles counted for both vehicle categories in October-November and March-April, with corresponding troughs in December-January and July-August. These patterns are probably seasonal, reflecting an increase in travel during the Easter and Spring school holiday period (and more pleasant driving and riding conditions). However, these patterns may also reflect an interaction with the timing of the counts. It is likely, but not known, that the December-January lull occurs because fewer counting sites are operative rather than there simply being fewer vehicles per se. A more detailed analysis is beyond the scope of this project.

3.2.4 Day of week

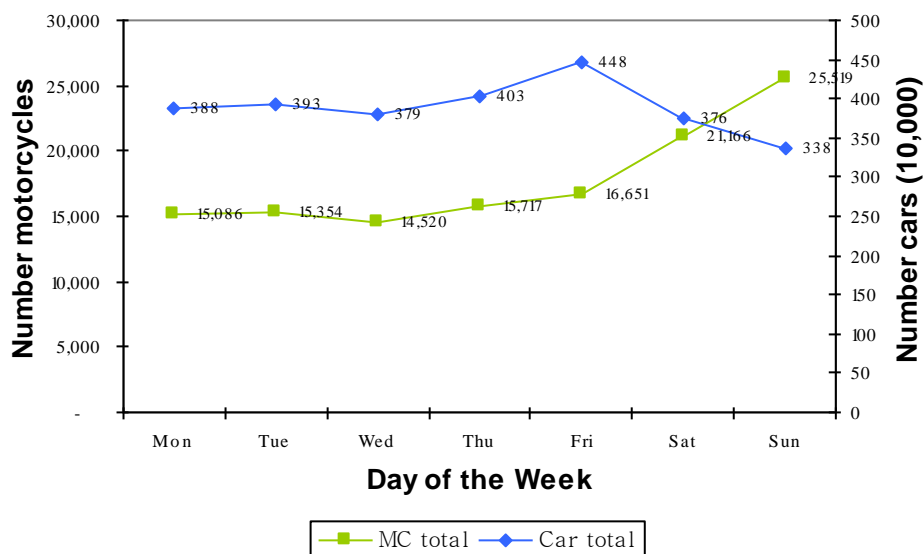


Figure 27 - Motorcycles vs All Vehicles Day of Week Comparison

Figure 27 presents the trend of motorcycle and all vehicle usage during the week. While vehicle use for all vehicles and motorcycles generally remain steady from Monday to Thursday, there is a slight increase in both categories mid week to Friday. Motorcycle use increases dramatically as expected on the weekend, while the overall number of vehicles on the road decreases over the weekend.

4.0 SUMMARY OF KEY POINTS/CONCLUSIONS

4.1 MOST TRAFFICKED SITES

The southbound carriageway of Maroondah Highway, 1.4 km from Marysville and 83.9 km from Melbourne recorded the most motorcycles, 900 passing through the collection point during the seven day collection period in 2005. This was followed by the northbound section of Melba Highway, 1.4 km north of Kinglake Road, and 67.9 km from Melbourne, which recorded 585 motorcycles. This was closely followed by Beach Road west of 'Gate 2', which produced the third highest motorcycle volumes, 582. Attachment 1 presents the sites with the highest recorded number of motorcycles. The sites popular with motorcyclists were generally not the sites heavily trafficked by other vehicles.

4.2 RURAL/METROPOLITAN DISTRIBUTION

Of the top 30 overall ranking for motorcyclist activity, 15 (50%) were rural sites. A comparison of motorcycle volumes to all vehicle volumes indicated a slightly higher proportion of motorcycles in rural areas when compared to metropolitan areas.

4.3 SPEED ZONE DISTRIBUTION

The largest number of motorcycles was recorded in the 100 km/h speed zone (50.9%) followed by the 60 km/h speed zone (32.7%). Travel in the 80 km/h zone comprised 12.3%. It is important to note that the proportion of travel recorded here is heavily influenced by the distribution of the collection sites amongst the speed limit zones. When considering volumes in the top 30 with respect to the speed zones, 44% of top 30 volumes are in 100 km/h zones and 41% in 60 km/h zones.

4.4 GENERAL SPEED DISTRIBUTIONS

The analyses results suggest that speeding may be a significant issue for motorcyclists along these routes, with 50% of the motorcycles counted exceeding the posted speed limit. Speeding was most likely in the lowest speed zone with 90% of riders exceeding the 40 km/h speed limit, the gap decreasing for 60 km/h speed zones. Adherence to the limit was most likely in 70 km/h speed zones.

4.5 DAY OF WEEK

Weekends recorded more motorcycles through the sites, accounting for nearly half the motorcycles recorded (42%). Motorcycle use was generally constant during the week, with slight peaks on Tuesdays and Fridays.

4.6 TIME OF DAY

The majority of riding was undertaken during 'leisure hours', that is, on weekends and before 08:00 and after 18:00 on weekdays, 53% of all riding was recorded during these timeframes. When considering volume per hour alone, motorcyclist volumes were the highest during business hours.

4.7 FUTURE WORK

This analysis was completed to provide a general, overall understanding of motorcyclist travel routes and characteristics. For this purpose, the data were sufficient in providing an indication of general motorcycle volumes, as well as timing and location of motorcycle use.

However, the interpretations and conclusions that can be drawn are somewhat limited as firstly, few details of the data collection sites are available to determine the impact of the sites selected on the eventual findings; and secondly, the data were extracted from a general vehicle counts database. Comparing data from routes or areas with a non-uniform number of data collection points can be potentially misleading. Similarly, seasonal factors are likely to have a bigger impact on riding behaviour than would be seen in car driving patterns. Counting equipment is not set up all year round; instead it is rotated across sites. Accordingly, the time of year a particular site is assessed will make a significantly bigger difference to motorcycle numbers than car numbers. Therefore, while providing general findings of motorcyclist activity at the sites in question, the findings do not provide a substantial basis for comparison of motorcyclist activity at all routes in Victoria.

The 2005 motorcycle data included a variable that indicated whether the count site was on a divided or undivided road – 6% of counts were collected on divided roads, 33% of counts were collected on undivided roads, and in the remaining 61% of count entries the road type was not provided (“unknown”). Unknowns represented 85% of rural area counts and thus created some difficulty in undertaking any significant analyses of this information. More refined detail in the data can provide some valuable insights in to aspects concerning single and dual carriageway road behaviour.

Other than a classification of rural versus metropolitan, count sites were not classified by any other category in any of the data provided. Having counts as a function of road type and area or region or municipality of travel (particularly in relation to leisure or recreational riders) can provide another level of analysis.

Additionally, using this study as a base, more detailed understanding of motorcyclist activity can be gained by specifically collecting motorcycle data at strategic locations. The counting sites that contributed to the current data set include both sides of the road (e.g. eastbound and westbound) and on some occasions there is little separation between counting sites. In some instances the latter may reflect the before and after of a significant intersection. In strategically choosing particular sites for a follow-up project targetting motorcycle use, consideration should be given to site selection beyond simply choosing the sites found here to have the highest counts. For example, given that they generally rank close together, there is probably little advantage to counting both sides of a road (assuming that a counting period is 24 hours across seven days). The data analysed here could also inform the decision as to whether it is beneficial to count at multiple sites in close proximity along the one route – for example, whether both sides of a prominent intersection should be counted.

To take account of seasonal variation in motorcycle use, counts should be made (of motorcycles and other vehicles) at particular sites more than once a year, perhaps once each season (or at least twice in a 12-month period). A comprehensive project would benefit from surveying a sample of riders at some sites (particularly those in metropolitan areas) and during particular hours (principally during business hours) to ascertain their reason for riding at that time – work-related, commuting or leisure.

ATTACHMENT 1 – Summary of top 30 most travelled sites (within data collection points) with key characteristics

Unique rank	Rank	Site	Count	% of top 30 unique sites	% of all sites	Metro/ Rural	Speed
1	1	MAROONDAH HWY S BD 1.4 KM S OF MARYSVILLE RD @ 83.9KM FROM MELBOURNE	900	9.3	2.8	R	100
2	3	MELBA HWY N BD 1.4 KM N OF KINGLAKE RD @ 67.9KM FROM NORTH OF MELBOURNE	585	6.1	1.8	R	100
3	4	BEACH RD W BD W OF GATE 2	582	6.0	1.8	M	60
4	5	MAROONDAH HWY S BD 2.3KM N OF YARCK RD @146.2KM FROM MELBOURNE	572	5.9	1.8	R	100
5	8	MAROONDAH HWY S BD 800M S OF YARCK RD @143.3KM FROM MELBOURNE	427	4.4	1.3	R	100
6	9	BUCKLEY ST W BD BTW BILSTON ST & ADMIRAL ST	393	4.1	1.2	M	60
7	11	PHW ON RAMP NEBD NE OF BEACH RD	369	3.8	1.2	M	80
8	13	MATTHEWS AV NWBD BTW DROMANA AV & WESTFIELD DR	337	3.5	1.1	M	60
9	14	CRANBOURNE-FRANKSTON RD NEBD BTW HALL RD & SCARBOROUGH AV	335	3.5	1.0	M	60
10	15	MAROONDAH LINK HWY S BD 2.1KM N OF GOULBURN VALLEY HWY @ 56.9KM FROM SEYMOUR	334	3.5	1.0	R	100
11	16	BACCHUS MARSH-GISBORNE RD NEBD BTW HOLTS LA & SOMERTON CT	315	3.3	1.0	M	60
12	18	WESTERN PORT HWY N BD BTW CRANBOURNE-FRANKSTON RD & CARRBOYD RD	315	3.3	1.0	M	80
13	19	YARRA BVD SWBD 500M SW OF YARRA ST	306	3.2	1.0	M	50
14	21	MELBA HWY N BD 1.4 KM N OF LANGS RD @100.0KM FROM MELBOURNE	302	3.1	0.9	R	100
15	23	GOULBURN VALLEY HWY W BD 600M E OF LIMESTONE RD @ 41.3KM FROM SEYMOUR	282	2.9	0.9	R	100
16	24	AVALON RD N BD BTW COZENS RD & COONAWARRA DR	267	2.8	0.8	M	60
17	27	BACCHUS MARSH RD NWBD BTW WOOLPACK RD & WESTERN HWY	258	2.7	0.8	M	80
18	28	CRANBOURNE-FRANKSTON RD NEBD BTW HALL RD & BROOKLAND GREENS BVD	251	2.6	0.8	M	60
19	29	MAROONDAH HWY N BD 1.5 KM S OF WHANREGARWEN RD @124.0KM FROM MELBOURNE	235	2.4	0.7	R	100
20	31	MAROONDAH HWY S BD 100M S OF SPRING CREEK RD @135.0KM FROM MELBOURNE	227	2.4	0.7	R	100
21	32	HALL RD E BD BTW EVANS RD & WESTERN PORT HWY	225	2.3	0.7	M	60
22	33	GISBORNE RD N BD BTW BACCHUS MARSH RD & BENNETT ST	224	2.3	0.7	M	60
23	34	HALL RD NWBD BTW CRANBOURNE-FRANKSTON RD & EVANS RD	220	2.3	0.7	M	60
24	38	RAILWAY AV NEBD BTW DERRIMUT RD & CEMETERY RD	208	2.2	0.6	M	60
25	41	PHILLIP ISLAND RD E BD BTW CHURCHILL RD & @ 14KM POST	205	2.1	0.6	R	80
26	42	IRONBARK RD E BD 200M W OF BARNARD ST @ 0.2KM POST	201	2.1	0.6	R	60
27	43	GREAT OCEAN RD NEBD 400M W OF COALMINE CREEK	196	2.0	0.6	R	100
28	44	BACCHUS MARSH-GISBORNE RD N BD 400M S OF WESTERN FWY @ 1.2KM FROM BACCHUS MARSH	195	2.0	0.6	R	60
29	47	BENDIGO REDESDALE RD E BD 500M W OF EDWARDS RD @ 2.5KM POST	190	2.0	0.6	R	60
30	48	CALDER HWY S BD 1KM N OF OLYMPIC PDE @157.0KM FROM MELBOURNE	185	1.9	0.6	R	100
Total			9641	100.0%	30.1%	52.4% rural	