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Road transport trends in Australian agriculture

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by Marsden Jacob Associates

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Foreword

Farm transport is an important component in the consideration of policy issues such as transport infrastructure pricing and provision, transport regulations, and taxation policy. This research provides a range of insights into the profile of farm vehicles in Australia, including the total number of vehicles, vehicle types and other features of farm vehicles.

The report is intended to provide a range of stakeholders with an understanding of the profile of farm transport. These stakeholders include policy makers and researchers in government (for example, transport departments and road agencies), the transport sector, the agricultural sector, and research institutions.

This research shows that there are approximately 71 000 vehicles that are classified as "primary producer" vehicles in Australia and that over the last five years, the methods of transportation used in each of the industries surveyed has remained relatively unchanged. This figure is significantly lower than some previous estimates, and highlights the lack of information available on heavy vehicle use in agriculture.

This research provides policy makers with a more in-depth understanding of the agricultural transport sector. The agricultural transport sector has particular characteristics, which may not be the same as the broader vehicle population. Questions about why these differences exist remain, and there may be opportunity to learn from other sectors about practises to better utilise heavy vehicle assets.

The report also highlights that agricultural industries are not 'all the same', and it is incorrect to draw conclusions about transport in one agricultural sector based on averages. For example, the use of heavy vehicles in the dairy industry is quite different from other agricultural industries. These characteristics are important to recognise when policies are implemented by governments that affect the transport sector, such as transport infrastructure and road pricing.

This report is an addition to RIRDC's diverse range of over 2000 research publications and it forms part of our National Rural Issues R&D program, which aims to identify and undertake research to inform national policy development and debate on issues important to rural industry.

Most of RIRDC's publications are available for viewing, free downloading or purchasing online at www.rirdc.gov.au. Purchases can also be made by phoning 1300 634 313.

Craig Burns
Managing Director
Rural Industries Research and Development Corporation

Abbreviations

ABS	Australian Bureau of Statistics
GVM	Gross Vehicle Mass
NFF	National Farmers' Federation
NTC	National Transport Commission
RIRDC	Rural Industries Research & Development Corporation
SMVU	Survey of Motor Vehicle Use

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Executive Summary

What the report is about

Marsden Jacob Associates (Marsden Jacob) was engaged by the Rural Industries Research and Development Corporation (RIRDC) to undertake research into Australia's current agricultural vehicle fleet, including trends in ownership and operation of the fleet.

Marsden Jacob's work entails an analysis of the nature of the fleet, how it is used, and trends in ownership and operation of the fleet.

There are three key aspects to this research:

1. a desktop review of published reports;

2. collation of available data from some of the road agencies and transport departments; and

3. a survey of farm businesses in selected industries.

Who is the report targeted at?

The report is intended to provide a range of stakeholders with an understanding of the profile of farm transport. These stakeholders include policy makers and researchers in government (for example, transport departments and road agencies), the transport sector, the agricultural sector and research institutions.

Where are the relevant industries located in Australia?

This study undertook research on farm vehicles used in the agricultural sector in Australia. The information on all agricultural sectors was limited to data sourced from the desktop review and information available from state governments. A direct survey of farm businesses obtained more detailed information about five segments of the agricultural sector. These segments are based on four agricultural industries selected across five different regions:

- Grains and oilseeds (Western Australia and South Australia) [1]
    - Value of production of approximately $5.3 billion in 2010-11
- Grains and oilseeds (New South Wales, Victoria and Queensland) [2]
    - Value of production of approximately $7.8 billion in 2010-11
- Livestock (New South Wales and Queensland)[3]
    - Value of production of approximately $7.2 billion in 2010-11

[1] Includes 'Cereals for grain', 'Legumes for grain', and 'Oilseeds for grain' for Western Australia and South Australia.

[2] Includes 'Cereals for grain', 'Legumes for grain', and 'Oilseeds for grain' for New South Wales, Victoria and Queensland.

[3] Includes 'Livestock slaughtered and other disposals' for New South Wales and Queensland.

- Fruit – including nuts (New South Wales, Victoria and Queensland)[4]
    - Value of production of approximately $3.2 billion in 2010-11
- Dairy (Victoria)[5]

    Value of production of approximately $2.5 billion in 2010-11

These agricultural industries were chosen because they have the largest values of production in Australia. The value of production figures were sourced from the Australian Bureau of Statistics' 'Value of Agricultural Commodities Produced' publication.[6] Additionally, to reflect similarities in supply chain characteristics and to avoid highly averaged results, categories were further segmented by region for the grains and oilseeds sector and limited to the major farming regions in terms of production for the other agricultural industries.

Aims/objectives

Farm transport is an important component in the consideration of policy issues such as:

- transport infrastructure pricing and provision;
- transport regulations; and
- taxation policy.

The objective of the project is to undertake research into the current agricultural fleet in Australia and provide insight into the trends in ownership and operation of this fleet. Specifically, the project focused on researching the following key aspects of farm transport:

- vehicle numbers and types;
- age and fuel efficiency of the fleet;
- on and off-farm mileage;
- schedules for replacing the fleet;
- trends in leasing or contracting transport services;
- the use of high productivity vehicles;
- issues with local access (first and last mile transport issues and conflicts with high productivity vehicle use);
- the use of seasonal registrations; and
- a breakdown of the information above by jurisdictions and industries.

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[4] Includes 'Fruit' and 'Nuts' for New South Wales, Victoria and Queensland.

[5] Includes 'Whole milk' for Victoria.

[6] ABS 2012, *Value of Agricultural Commodities Produced, Australia,* 2010-11, Cat. no. 7503.0, Australian Bureau of Statistics, Canberra.

The scope of the research was limited to vehicles that are used: on the farm; to move inputs to the farm; or to move produce from the farm. The research excluded agricultural machinery and tractors.

Methods used

Desktop review

This entailed a review of approximately 25 published reports relating to transportation within the Australian agricultural sector. These reports provided background information about Australia's agricultural sector and reported on published studies about transportation methods used among farm businesses.

Collation of data from road agencies and transport departments

The desktop review was then built on with data from road agencies and transport departments, to provide a snapshot of farm vehicles in Australia. We contacted road agencies / transport departments from five mainland Australian states to obtain information relevant for the study.

Survey of farm businesses

We then conducted a survey of farm businesses across Australia to gain detailed information about their transportation methods. The survey included analysis of five segments:

- Grains and oilseeds (Western Australia and South Australia);
- Grains and oilseeds (New South Wales, Victoria, and Queensland);
- Livestock (New South Wales and Queensland);
- Fruit and nuts (New South Wales, Victoria, and Queensland); and
- Dairy (Victoria).

Each of the five segments represented 20 per cent of the total sample size (43 respondents in each segment), and as individual categories, provides a reasonable level of statistical significance (15 per cent margin of error at a 95 per cent confidence level). As an aggregate (215 responses in total), the survey sample results are statistically significant, at a 7 per cent margin of error, at a 95 per cent confidence level.

Farmers recruited to the survey were drawn from McNair Ingenuity Research's extensive database of broadacre farm contacts to obtain a representative sample.

Results/key findings

Our research provides a range of insights into the profile of farm vehicles, including the total number of vehicles, vehicle types and other features of farm vehicles.

A range of estimates of vehicle numbers are shown in Table E1.

The survey of farm businesses indicates that there are an estimated total of 204 000 farm vehicles owned and operated by farm businesses in Australia (this includes both light and heavy vehicles).

From this figure, we estimate that there are 87 000 heavy farm vehicles, which includes heavy farm vehicles that are both registered and not registered for use on public roads. We note that both of these figures do not include vehicles that are not owned by farmers but are used to transport goods to and from farms.

In comparison, our research shows that there are approximately 71 260 vehicles that are classified by state governments as “primary producer” heavy vehicles in Australia. This is based on registration data obtained from state governments and previous information collected by the National Transport Commission.

Using this information, we estimate that there are 150 000 heavy farm vehicles, which includes both registered and non-registered vehicles owned and operated by farm businesses, and also includes those not owned and operated by farm businesses (such as contracted transport services).

Table E 1: Summary of data sources

Data	Data source	Number of vehicles	Vehicle categories	Notes	Ownership
Total farm vehicles owned and operated by farm businesses (light and heavy vehicles)	Estimate by Marsden Jacob using results from farm survey	204 000	Light and heavy vehicles	Includes both registered and non-registered vehicles	Owned and operated by farm businesses
Estimated heavy farm vehicles (greater than 4.5 gross tonnes)	Estimate by Marsden Jacob using results from farm survey	87 000	Heavy vehicles	Includes both registered and non-registered vehicles	Owned and operated by farm businesses
Estimated registered farm vehicles	Primary producer registration data from state and territory governments	71 260	Heavy vehicles	Includes only registered vehicles	Owned and operated by farm businesses
Estimated heavy farm vehicles (greater than 4.5 tonnes) plus those involved in transporting goods to and from farm	Estimate by Marsden Jacob using results from farm survey	150 000	Heavy vehicles	Includes both registered and non-registered vehicles	Owned and operated by farm business, as well as those not owned and operated by farm businesses

Notes:

1. The total number of farm vehicles owned and operated by farm businesses (light and heavy vehicles) of 204 000 is based on the average number of farm vehicles per farm business derived from the survey (1.7 vehicles) and multiplied by 120 980 farms (sourced from Australian Bureau of Statistics publication 7121.0 for farms solely devoted to agriculture).

2. The estimated number of heavy farm vehicles of 87 000 is equal to the average number of heavy farm vehicles per farm business (0.72 vehicles) multiplied by 120 980 farms (sourced from Australian Bureau of Statistics publication 7121.0 for farms solely devoted to agriculture).

3. The number of heavy vehicles as reported by state government transport department/road agencies (71 260) is sourced directly from Transport for NSW, VicRoads, Department of Transport and Main Roads (QLD), Main Roads Western Australia; Number of farm heavy vehicles for South Australia, Tasmania, and the Northern Territory were sourced from the National Transport Commission.

4. The estimated number of heavy farm vehicles (greater than 4.5 tonnes) plus those involved in transporting goods to and from farm of 150 000 is based on the ratio of owned vehicles versus vehicles not owned by farm businesses, taking into account the ratio of registered and non-registered vehicles. The 150 000 figure assumes that the average kilometres travelled by vehicles owned by farm businesses is the same as the average kilometres travelled by vehicles not owned by farm businesses. This assumption needs to be treated with caution as the focus of this study is on farm vehicles that are owned by farm businesses, and therefore it has not been tested.

In comparison, these estimates of vehicle numbers are significantly less than a previous estimate cited by the National Farmers Federation in a 2007 submission which suggested that there were 120 000 farm heavy vehicles operating on Australian farms in 1996 (Translog 2000). The possible reasons for these differences are discussed in this report, and include possible methodological differences between our approach and the way that the Translog study estimated vehicle numbers, and the 13 year difference between this current study and the Translog study.

The registration data from state governments also reveals that across New South Wales, Victoria, and Queensland, rigid trucks typically make up about 80 per cent of all farm vehicle configurations with a gross vehicle mass (GVM) of 4.5 tonnes and above. Articulated trucks make up the remaining 20 per cent of heavy vehicle configurations registered by farmers.

In terms of the profile of farm vehicles, the survey of farmers found that:

- most farm businesses within all five segments surveyed own and operate between one and five farm vehicles (this includes both light and heavy vehicles). The dairy and livestock industries have a statistically higher proportion of farms that own and operate one or two vehicles than the grain industry sectors surveyed;
- light commercial vehicles and heavy rigid trucks without trailers are the most common types of vehicles owned and operated by farmers across all five segments surveyed;
- almost all farm vehicles (this includes both light and heavy vehicles) operated by farm businesses are owned, rather than leased;
- heavy farm vehicles (greater than 4.5 gross tonnes) travel on average, across all five segments surveyed, around 13 000 kilometres per year;
- average fuel consumption as stated by farmers for each type of vehicle is broadly consistent with expectations;
- the average proportion of on-farm vehicle usage across the five industry segments is close to 50 per cent;
- most vehicles within each of the segments surveyed are registered all year round;
- the vast majority (69 per cent) of farm vehicles are eight years or older;
- around 40 per cent of vehicles operated by farmers are envisaged by farmers to be replaced in another eight years or more;
- ninety-two per cent of survey respondents stated that when they replace their current vehicle they will purchase the same vehicle type;
- over 50 per cent of operators of articulated vehicles, B-doubles and road trains stated that they do not use one tied configuration – rather they change vehicle configuration according to their freight needs;
- most vehicles travel around 38 per cent of their time on unsealed roads;
- the vast majority of vehicles do not participate in any mass concessional schemes or permits[7];

[7] Concessional schemes or permits enable heavy vehicles to operate outside of general access conditions, such as providing for over-long or over-mass vehicles.

- 14 per cent of survey respondents stated that they have issues with vehicle access along their transport routes that constrain their business (such as mass and vehicle type issues);

- for the grains and oilseeds industries, the greatest travel distance is attributed to transporting farm outputs to port terminals; for the livestock industry, 70 per cent stated that the next point in the supply chain is the sale yard; for those within the fruit and nuts industry, 33 per cent of respondents surveyed stated that the next point in the supply chain is the market[8]; most dairy farm businesses surveyed (79 per cent) stated that the next point in the supply chain was a processing plant; and

- apart from the dairy industry (where the buyer of the milk typically collects the produce directly from the farm), the other industries surveyed mostly transport their farm produce to the next point in the supply chain either via vehicles owned by the farm business or by an external party contracted by the farm business.

Research findings indicate the following trends are occurring in agricultural vehicles:

- over the last five years, the proportion of vehicles owned and leased among farm businesses surveyed has remained unchanged, both overall and within individual industry segments;

- in general, over the last five years there has not been any major shift in the type of transportation methods (e.g. by vehicles owned by farm) adopted by any of the segments;

- based on vehicle registration data obtained from New South Wales and Queensland, the number of rigid trucks registered has been declining over time and the number of articulated vehicles has been rising.

Furthermore, by comparing the survey findings to known information about the general Australian vehicle fleet (as outlined in the NTC Freedom of Information transport data obtained from the ABS Survey of Motor Vehicle Use)[9], we are able to draw some general conclusions about farm vehicles:

- the average number of kilometres travelled by rigid and articulated vehicles operated by farmers is around 10 234 kilometres and 23 416 kilometres each year (with a 15 per cent margin of error), which is significantly less than the broader population of heavy vehicles where rigid vehicles travel an average of 24 824 kilometres (with a 3 per cent margin of error) and articulated vehicles travel an average of 95 855 kilometres per year (with a 2 per cent margin of error); and

- the composition of rigid and articulated vehicles as owned by the farm business surveyed is consistent with the composition of the broader vehicle fleet (comprised of approximately 80 per cent rigid vehicles and 20 per cent articulated vehicles).

Implications for relevant stakeholders

Our research into vehicles used in the farm sector provides a current and empirical evidence base for stakeholders. Although the surveying we have undertaken is not a comprehensive examination of all aspects of the use of vehicles in the agricultural sector, it provides insightful information into various aspects of the current stock of farm vehicles and historical and future trends. Additionally, we have

[8] Compared to the other industries, the fruit and nuts industry has a more diverse range of types of places representing the next point in the supply chain.

[9] National Transport Commission 2012, Freedom of information request spreadsheet Option 3b, viewed 12 June 2013, < http://www.ntc.gov.au/ViewPage.aspx?DocumentId=2287>.

provided further insights by making comparisons to the general vehicle fleet – where we have been able to do so.

Our research and analysis provides a wide variety of insights at both an aggregate level and for the four major agricultural industries that we identified. There is a range of types of useful insights that we have been able undertake using both data from state and territory governments and our survey of farmers:

- there are a range of ways in which we can express the number of vehicles that are involved in farm businesses. For example: including both light and heavy vehicles; including just heavy vehicles; including non-registered vehicles; and including those vehicles used to transport goods to and from the farm. The appropriate definition of vehicle numbers may depend on the policy issue at hand;

- there are some similarities in the current stock of vehicles across difference industry sectors but also some distinct differences. In aggregate across the five segments surveyed, the most common types owned and operated by farmers are light commercial vehicles and heavy rigid trucks. Some of the key differences are: the dairy and livestock industries have a statistically higher proportion of farms that own and operate one or two vehicles than the two grain industry sectors. Furthermore, apart from the dairy industry (where the buyer of the milk typically collects the produce directly from the farm), the other industries surveyed mostly transport their farm produce to the next point in the supply chain either via vehicles owned by the farm business or by an external party contracted by the farm business;

- there are a range of general observations across all industries. Some key ones are: almost 50 per cent of farm vehicles travel on unsealed roads; over half of operators of articulated vehicles, B-doubles and road trains stated that they change vehicle configuration according to their freight needs[10]; and there is a small proportion of farmers that are experiencing issues with vehicle access to roads (14 per cent of the survey respondents experience vehicle access problems[11] on the road network), suggesting potential opportunities for efficiency improvements; and

- the industry trends are not so obvious. However, our survey did observe that for the grains and oilseeds industries, the greatest travel distance is attributed to transporting farm outputs to storage facilities; for the livestock industry, 67 per cent stated that the next point in the supply chain is the sale yard; for those within the fruit and nuts industry, 44 per cent of respondents surveyed stated that the next point in the supply chain for them varied, such as to a distributor, a packing shed, directly to shops, wineries, transport depot, and so on; most dairy farm businesses surveyed (65 per cent) stated that the next point in the supply chain was a processing plant. Furthermore, apart from the dairy industry, the other industries surveyed mostly transport their farm produce to the next point in the supply chain either via vehicles owned by the farm business or by an external party contracted by the farm business. Over the last five years, there has been a slight increase in the use of contracted transportation services and a slight decline in the use of vehicles owned by the farm.

Therefore, there are a range of characteristics of vehicles in the farm sector that are important to recognise when policies are implemented by governments that affect the transport sector, such as transport infrastructure and road pricing, and in developing industry-specific policies.

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[10] Note that the study did not examine the way in which trailers or prime movers are used to change the vehicle configuration for different freight tasks.

[11] On some roads in Australia vehicle access is restricted according to the type of vehicle and by maximum mass limits.

The results from the farm survey presented in this paper have been averaged across all farmers within particular industry segments. Therefore, we recognise that within a particular segment there are farmers that may be above or below the average and the report should be read in that context.

Recommendations

- **Examine opportunities for improved transport efficiency in the agricultural sector**

There are a range of indicators to suggest that further research could be undertaken to determine whether there is potential to improve transport efficiency within the farm sector. For example, there is evidence from the survey that:

- there are a range of vehicle access and road infrastructure issues being experienced by farmers, restricting use and investment in higher productivity vehicles. This is evident in the survey results where 14 per cent of survey respondents described issues that they have with the road network in Australia. Research could be conducted to further ascertain the exact nature of these access issues;

- the average distance travelled by heavy farm vehicles is less than the broader heavy vehicle fleet, which may indicate that there is scope for greater utilisation of the agricultural transport fleet, such as through an increase in the proportion of contracted transportation services. Research could be conducted to investigate the reasons why farmers choose to employ the use of contracted transportation services, such as timing and availability of contract services at critical times during farm seasons. Additionally, research could be undertaken to understand how vehicle operating costs vary between farm-owned and contracted service providers, as well as similar vehicles in non-farm sectors;

- most farmers are not monitoring their fuel use. This may indicate that there are opportunities for improvements in fuel efficiency within the farm sector; and that

- farmers that use articulated vehicles are changing the nature of the vehicle configuration according to the freight task. Further surveying could be undertaken to determine exactly how trailers and prime movers are used in different vehicle configurations and the reason for the changes to configuration.

There are some limitations in our comparisons across our five industry sectors because of the sample sizes. Further sampling could provide greater clarity on the differences across sectors. Additionally, it would be useful to obtain more detailed data on the age of vehicles at the higher end of the age brackets. These issues could be examined further to investigate ways to improve transport efficiency in the supply chain process. A better understanding of these issues will allow more informed policy decisions in order to improve efficiency and productivity in the farm sector.

- **Conduct further research into vehicle choice and external contracted transportation services**

The survey data collected from road agencies and transport departments indicate there is some evidence that there has been a move towards larger farm vehicles over time. However, the survey results do not provide evidence that farm businesses have been replacing their vehicles with larger vehicles (in the last five years). Given this contradiction and the implications of larger vehicles for transport efficiency, there may be benefit in further examining vehicle choice decisions by farmers, and what influences these decisions.

Additionally, since detailed information was obtained on farm vehicles owned and operated by the farm business and not on external transportation services, there may be benefit in further examining

the external transportation part of the supply chain to give a more holistic view of the agricultural transport industry.

Finally, there may be a benefit in exploring innovative approaches to transport that are being undertaken by different farmers, including issues such as vehicle utilisation; vehicle maintenance; route choices; and vehicle choice.

1. Introduction

Farm transport is an important component in the consideration of policy issues such as:

- transport infrastructure pricing and provision;
- transport regulations; and
- taxation policy.

This report is intended to provide a range of stakeholders with an understanding of the profile of farm transport in Australia. These stakeholders include policy makers and researchers in government (e.g. transport departments and road agencies), the transport sector, the agricultural sector and research institutions.

Marsden Jacob Associates (Marsden Jacob) was engaged by the Rural Industries Research and Development Corporation (RIRDC) to undertake research into Australia's current agricultural vehicle fleet, including trends in ownership and operation of the fleet.

Marsden Jacob's work entailed an analysis of the nature of the current agricultural vehicle fleet, how it is used, and trends in ownership and operation of the fleet.

Research findings in this report are based on:

- a desktop review of published reports;
- collation of available data from some of the road agencies and transport departments; and
- a survey of farm businesses in selected industries.

1.1 Definitions

Three key project definitions are used in this report:

- **Farm vehicles**: are vehicles owned by farm businesses for the purpose of moving farm inputs and produce on and off the farm. This definition excludes agricultural machinery or tractors that are used exclusively for on-farm purposes without access to the road network. Where other vehicles are included, these are explicitly stated.
- **Heavy vehicles**: are vehicles with Gross Vehicle Mass (GVM) of over 4.5 tonnes.
- **Light vehicles**: are vehicles with GVM of 4.5 tonnes or less unless otherwise specified.

The heavy vehicle categories used in this report are consistent with the national charging definitions used by the National Transport Commission. These categories can be simplified to a small number of categories as per Table 1.

Table 1: Categories of heavy vehicles

Type of heavy vehicle	Categories
Rigid	• Rigid truck (no trailers) • Rigid truck (with trailers) – GVM of 42.5 tonnes or less • Rigid truck (with trailers) – with a GVM greater than 42.5 tonnes
Articulated	• Short-combination (articulated with one trailer) – could also be referred to as short-combination prime mover • Multi-combination (articulated with more than one trailer) – could also be referred to as medium and / or long combination. This category includes B-doubles and road trains

Notes:

1. The ABS (2012) Survey of motor vehicle use defines a rigid truck as a motor vehicle exceeding 3.5 tonnes GVM, constructed with a load carrying area. Included are normal rigid trucks with a tow bar, draw bar or other non-articulated coupling on the rear of the vehicle. Note that in this report we have restricted the definition of heavy vehicles to over 4.5 tonnes, which is consistent with the NTC approach to heavy vehicle charging.

2. The ABS (2012) Survey of Motor Vehicle Use defines an articulated truck as a motor vehicle constructed primarily for load carrying, consisting of a prime mover which has no significant load carrying area, but with a turntable device which is linked to a semi-trailer.

Where appropriate (and data are available) we will provide further disaggregation beyond these categories.

2. Objectives

The objective of the project was to undertake research into the current agricultural fleet in Australia and gain insight into the trends in ownership and operation of this fleet. Specifically, the project focused on researching the following key aspects of farm transport:

- vehicle numbers and types;
- age and fuel efficiency of the fleet;
- on and off-farm mileage;
- schedules for replacing the fleet;
- trends in leasing or contracting transport services;
- the use of high productivity vehicles;
- issues with local access (first and last mile transport issues and conflicts with high productivity vehicle use);
- the use of seasonal registrations; and
- a breakdown of the information above by jurisdictions and industries.

The scope of the research was limited to vehicles that are used: on the farm; to move inputs to the farm; or to move produce from the farm (excluding agricultural machinery and tractors).

3. Methodology

The following sections provide a detailed description of the approach undertaken in completing each of the components of the project.

Overall, there were three components to the project:

- a desktop review of published reports;
- the collation of available data from selected road agencies and transport departments; and
- a survey of farm businesses in selected industries.

3.1 Desktop review of published reports

We conducted a desktop review of published reports relating to road transport in the agricultural sector, to provide a base for the study. This entailed the analysis of approximately 25 reports, of which 20 of them are referred to in this document.

These reports provided background information about Australia's agricultural sector as well as published studies about transportation methods used among farm businesses. In particular, as part of the desktop review, we obtained further detailed data from the National Transport Commission on their 2009 Incremental Pricing Survey.

The desktop review is outlined in section 4 of this report.

3.2 Data collection from road agencies / departments

The literature was then built on with data from road agencies and transport departments to provide a snapshot of farm vehicles in Australia. We contacted road agencies / transport departments from five mainland Australian states to obtain information relevant for the study. We provided these organisations with an introductory letter explaining the purpose of the study and the type of information we were seeking. The specific organisations contacted are listed in Appendix B and introductory letter provided to organisations is provided in Appendix C.

Our estimates of farm vehicle numbers are based on information provided by state road transport agencies and information from the National Transport Commission. The states contacted were New South Wales, Victoria, Queensland, Western Australia, and South Australia. The number of farm heavy vehicles for South Australia, Tasmania, and the Northern Territory were sourced from the National Transport Commission. The number of heavy farm vehicles in the Australian Capital Territory was unable to be determined as it does not offer any primary producer concession for heavy vehicles.

Data from road agencies / transport agencies were obtained between April and June 2013. The data obtained from each jurisdiction varies in terms of depth of information.

Information and data obtained from the desktop review and consultation with road agencies and departments are outlined in section 4 of this report.

3.3 Survey approach

To collect more detailed information about farm vehicle usage in Australia, we undertook a survey of farmers in May 2013.

- **Survey design**

  The survey instrument was designed by Marsden Jacob in collaboration with RIRDC, the National Farmers' Federation, the National Transport Commission, and the National Heavy Vehicle Regulator, and was approved by RIRDC prior to the commencement of surveying. A copy of the survey is provided in Appendix E.

- **Sample segmentation**

  The survey sample was segmented into five groups. Each of the five segments represented 20 per cent of the total sample size (43 respondents in each segment), and as individual categories, provides a reasonable level of statistical significance (15 per cent margin of error at a 95 per cent confidence level) and is within the project budget.

  The final respondent sample was comprised of five segments:

  - ***Grains and oilseeds (Western Australia and South Australia)***

    This segment includes crops grown (such as wheat, barley, pulses and oilseeds) in Western Australia and South Australia. Farm vehicles are used for a variety of purposes including moving farm inputs (such as fertilisers) to farms and moving farm outputs (crops) to the next point in the supply chain. The next point is typically a storage facility (owned by a bulk handling company), which is located up country or at ports.

  - ***Grains and oilseeds (New South Wales, Victoria and Queensland)***

    This segment includes crops grown (such as wheat, barley, pulses and oilseeds) in New South Wales, Victoria and Queensland. Farm vehicles are used for a variety of purposes including moving farm inputs (such as fertilisers) to farms and moving farm outputs (crops) to the next point in the supply chain. The next point is typically: a storage facility (owned by a bulk handling company), which is located up country; a feed mill; or a flour mill.

  - ***Livestock (New South Wales and Queensland)***

    This segment includes livestock produced in New South Wales and Queensland. Farm vehicles are typically used to transport livestock from saleyards to farms or from the farm to the next point in the supply chain. This can be either to live export ports, saleyards, feedlots, and meat processing plants.

  - ***Fruit and nuts (New South Wales, Victoria and Queensland)***

    This segment includes fruit and nut produce from New South Wales, Victoria, and Queensland. Farm vehicles are used for a variety of purposes including moving farm inputs (such as fertilisers) to farms and moving farm produce to the next point in the supply chain. The next point in the supply chain is typically to a packing facility, a wholesaler, or a retailer.

- ***Dairy (Victoria)***

  This segment includes dairy produce from Victoria. Farm vehicles are typically used to transport inputs to the farm or to transport dairy produce to the next point in the supply chain. The next point in the supply chain is typically a processing facility, or a retailer.

These agricultural industries were selected because they have the largest values of production in Australia. Additionally, to reflect similarities in supply chain characteristics and to avoid highly averaged results, categories were further segmented by region for the grains sector and limited to the major farming regions in terms of production for the other agricultural industries.

Further information relating to the sampling strategy is provided in Appendix D.

- **Sample recruitment**

  Farmers recruited to the survey were drawn from McNair Ingenuity Research's extensive database of broadacre farm contacts to obtain a representative sample. The database provided a total sample of 2000 potential farms, comprised of a random selection of:

  - 1000 farms within the grain and oilseeds industry in New South Wales, Victoria, Queensland, South Australia and Western Australia; the dairy industry in Victoria; and the livestock industry in New South Wales and Queensland; and

  - 1000 farms within the fruit and nut and dairy sector in New South Wales, Victoria and Queensland.

- **Fieldwork**

  The survey was undertaken via telephone by market research firm McNair Ingenuity Research.

  The telephone survey was approximately 17 minutes in length. The surveys were conducted over the following dates:

  - Pilot interviews: Monday 13 May 2013 – Wednesday 15 May 2013

  - Main fieldwork: Thursday 16 May 2013 – Monday 27 May 2013

  A total of 215 survey responses (including 15 pilot surveys) were collected. Assessing the total number of responses as a whole is not very insightful because it is highly summarised. Therefore to extract meaningful data for individual industries, the survey of farmers was focused on five segments in the Australian agricultural sector. These segments were based on four agricultural industries across five different regions.

4. Desktop review and data collection from state road agencies / departments

4.1 Total farm vehicles

This section summarises farm / primary producer vehicle types and numbers by state, based on evidence from the desktop review and consultation with state transport departments / road agencies.

This section shows that:

- there are currently an estimated **71 260** heavy vehicles that are classified by state governments as "primary producer" heavy vehicles in Australia;
- most vehicles owned by farm businesses are registered New South Wales, Victoria, and Queensland; and
- there are a greater number of light vehicles classified as primary producer vehicles than heavy vehicles in the states that provided us with this level of data (New South Wales, Victoria and Queensland).

4.1.1 Background to transport in the farm sector

In 2009-10, there were approximately 134 000 farm businesses in Australia.[12] Farms contributed $48.7 billion (at farm-gate) to the Australian economy during that time, equivalent to three per cent of Gross Domestic Product (GDP). When value-adding processes are included, this figure increases to $155 billion (or 12 per cent).[13]

Most of Australia's agricultural businesses are engaged in beef cattle farming, dairy cattle farming, sheep farming, grain growing, or a combination of two or more of these activities. Measured by total value of production, the highest earning agricultural commodities in Australia are cattle and calf slaughterings, followed by wheat, milk, vegetables, fruit and nuts, sheep and lamb slaughterings, and wool. Large quantities of Australian wool, beef, wheat, and dairy products are exported.[14]

Most farms in Australia are concentrated within the eastern states of New South Wales, Victoria, and Queensland (with a total of 92 918 farms or 77 per cent of all farms).[15] The majority of agricultural goods transportation in Australia is via roads, with the grains industry the only significant user of rail transport.[16] According to the Australian Bureau of Statistics, in 2001, total freight of food and livestock in Australia (including processed food and livestock as well as farm freight) amounted to 26 billion tonne-kilometres, representing 30 per cent of the national freight task that year.[17]

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[12] ABS 2012, Year Book Australia, Cat. no. 1301.0, Australian Bureau of Statistics, Canberra.

[13] National Farmers' Federation 2012, *NFF Farm Facts: 2012*, viewed 5 March 2013, <http://www.nff.org.au/farm-facts.html>.

[14] ABS 2012, Year Book Australia, Cat. no. 1301.0, Australian Bureau of Statistics, Canberra.

[15] National Farmers' Federation 2012, *NFF Farm Facts: 2012*, viewed 5 March 2013, <http://www.nff.org.au/farm-facts.html>.

[16] Rural Industries Research and Development Corporation 2011, *Transport Infrastructure for Australia's Agricultural Needs*, Publication No. 11/096, RIRDC, Canberra.

[17] ABS 2002, *Freight Movements*, Cat. no. 9220.0, March 2001 (re-issue), Australian Bureau of Statistics, Canberra.

4.1.2 An estimated 71 000 heavy farm vehicles registered nationally

Marsden Jacob estimates that there are currently **71 260** heavy vehicles that are classified by state governments as "primary producer" vehicles in Australia (see Table 2). This is based on registration data obtained from state governments and previous information collected by the National Transport Commission.

Estimates in Table 2 are based on information provided by road transport agencies and estimates. Our evaluation suggests this is a good indicator of the number of farm vehicles owned and operated by farmers in Australia, since farmers would have an incentive to register their vehicle as a primary producer vehicle in order to receive a concession on registration charges.[18]

The number of heavy farm vehicles estimated by Marsden Jacob differs from a 2007 submission by the National Farmers Federation[19] (which cites a 2000 Translog study that is based on 1996 TransEco data[20]) which suggests that there were 120 000 farm heavy vehicles operating on Australian farms in 1996, representing over 50 per cent of all Australian vehicles over 4.5 tonnes.

While we have not been able to source information on the composition of the Translog number of farm vehicles in order to reconcile these differences, it is possible that the Translog data provides different results to our estimates for a variety of reasons, including:

- the farm sector has evolved since the Translog data was produced seventeen years ago;
- there may have been a very different mix of vehicle ownership arrangement in 1996 (farm owned and contracted services) compared to 2013; and
- the Translog data may have included vehicles not owned by farm business but used to transport goods to and from the farm.

[18] This assumption excludes New South Wales, as in some scenarios, it may be more cost effective for farmers to comply with national charges rather than opt in for the primary producer concession.

[19] National Farmers' Federation 2007, *2007 Heavy Vehicle Charges Determination: Draft Regulatory Impact Statement – NFF Submission*, July, NFF, Canberra.

[20] TransEco 1996, *The Structure of the Road Transport Industry*, TransEco, Melbourne.

Table 2: Estimated number of heavy farm vehicles registered in Australia

State / Territory	Number of heavy vehicles (GVM > 4.5 tonnes) as reported by ABS SMVU	Number of heavy farm vehicles owned by farmers as reported by road agencies / departments
New South Wales	141 589	18 369
Victoria	131 031	19 223
Queensland	122 034	18 256
Western Australia	77 248	8 569
South Australia	38 843	5 805
Tasmania	12 959	821
Australian Capital Territory	2 733	-
Northern Territory	6 999	217
Total	**533 435**	**71 260**

Source: Number of heavy vehicles (GVM > 4.5 tonnes): Australian Bureau of Statistics (2012), Survey of Motor Vehicle Use, 12 months ended 30 June 2012, Canberra; Number of heavy vehicles as reported by state government transport department/road agencies: Sourced directly from Transport for NSW, VicRoads, Department of Transport and Main Roads (QLD), Main Roads Western Australia; Number of farm heavy vehicles for South Australia, Tasmania, and the Northern Territory were sourced from the National Transport Commission.

Notes:

1. Results may not equal exactly due to rounding.

2. 'Heavy farm vehicles' refers to farm vehicles with a gross vehicle mass of over 4.5 tonnes.

3. The total number of farm vehicles owned by farm vehicles in Table 2 may be slightly underestimated due to the following reasons: we were unable to determine the number of heavy farm vehicles in the Australian Capital Territory (as they do not offer any primary producer concessions for heavy vehicles); we did not include the number of farm vehicles that are not owned by farmers; we did not include farm vehicles that are not registered (e.g. vehicles that are used for on-farm purposes 100% of the time).

4. Definitions of primary producers differ in each jurisdiction (see Appendix A) and therefore may impact on the total number of registered farm vehicles.

4.1.3 A decline in NSW primary producer vehicles

As at December 2012, New South Wales had **50 358** registered primary producer vehicles[21] comprising:

- **18 369** heavy vehicles (GVM of over 4.5 tonnes)[22]; and
- **31 989** light vehicles (GVM of 4.5 tonnes or less).[23]

[21] Data sourced from the Transport for NSW on 17 April 2013.

[22] Note that this figure includes primary producer vehicles that do not receive a primary producer concession, but are recorded as primary producer vehicles.

[23] Light vehicles include trucks and passenger vehicles with a GVM of 4.5 tonnes or less such as light trucks, commercial vehicles, and utility vans.

Given that New South Wales has 38 554 farms[24], this suggests that on average, each farm owns approximately 1.3 vehicles (light and heavy vehicles) and 0.48 heavy vehicles.

Between the years 2000 and 2012, the total number of primary producer vehicles declined by 25 per cent (Figure 1) with almost all of this resulting from a falling number of light vehicles.

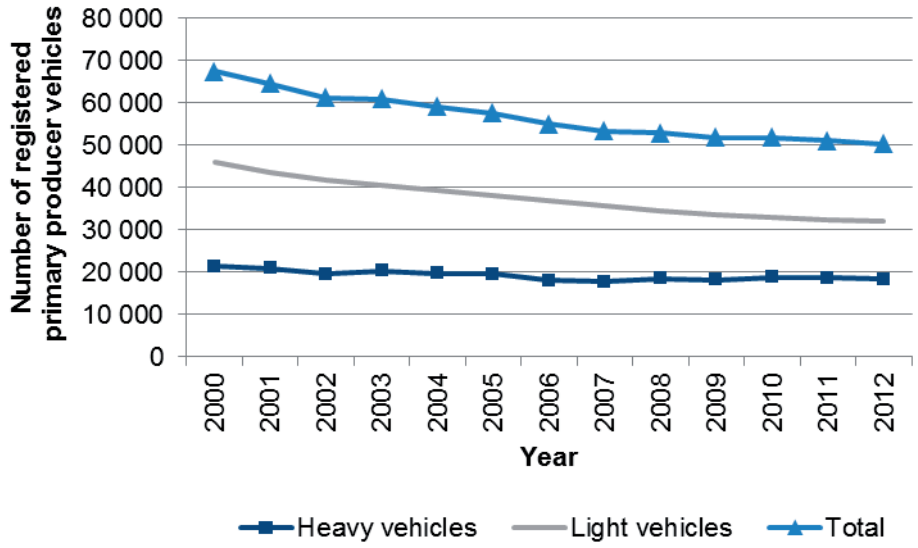

Figure 1: Number of primary producer vehicles registered in NSW, 2000-2012 (Transport for NSW)

Notes:

1. Due to incomplete time series data provided by Transport for NSW, 'Long Combination Primer Mover and Trailers', 'Medium Combination Prime Mover – B Double', and 'Long Combination Prime Mover and Trailers' were combined to provide a time series for 'Heavy vehicles'.

4.1.4 Victoria has the highest number of total primary producer vehicles in Australia

Victoria has **60 818** registered primary producer vehicles[25] as at October 2011 for heavy vehicles and August 2011 for light vehicles, comprising:

- **19 223** heavy vehicles (GVM of over 4.5 tonnes)[26]; and
- **41 595** light vehicles (GVM of 4.5 tonnes or less).[27]

Given that Victoria has 29 638 farms[28], this suggests that on average, each farm owns approximately 2.1 vehicles and 0.65 heavy vehicles.

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[24] National Farmers' Federation 2012, *NFF Farm Facts: 2012*, viewed 2 July 2013, <http://www.nff.org.au/farm-facts.html>.

[25] Data sourced from VicRoads.

[26] This figure excludes Special Purpose Vehicles such as Plant Based and Road-going truck based vehicles. Data as at October 2011.

[27] Light vehicles include trucks and passenger vehicles with a GVM of 4.5 tonnes or less such as light trucks, commercial vehicles, and utility vans. Data as at August 2011.

[28] National Farmers' Federation 2012, *NFF Farm Facts: 2012*, viewed 2 July 2013, <http://www.nff.org.au/farm-facts.html>.

4.1.5 A relatively even number of heavy and light primary producer vehicles in Queensland

Queensland has **37 056** farm primary producer vehicles registered as at 30 April 2013[29], comprising:

- **18 256** heavy vehicles (GVM of over 4.5 tonnes); and
- **18 800** light vehicles (GVM of 4.5 tonnes or less).[30]

Given that Queensland has 24 726 farms[31], this suggests that on average, each farm owns approximately 1.5 vehicles and 0.74 heavy vehicles.

Figure 2 illustrates that from 2009 to 2013, the number of farm vehicles in Queensland has declined slightly, reflecting a slight reduction in the number of light vehicles.

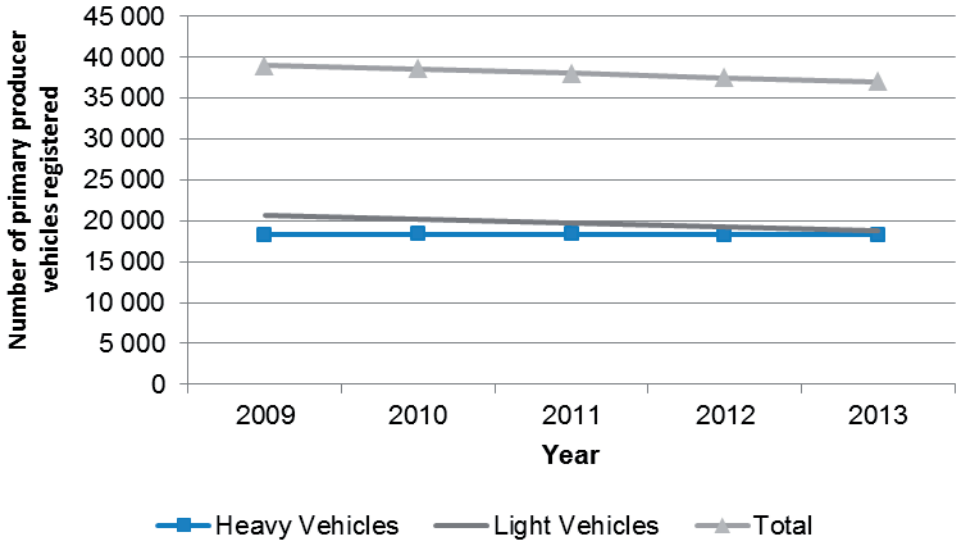

Figure 2: Primary producer vehicles registered in Queensland, as at 30 April 2013 (Queensland Department of Transport and Main Roads)

4.1.6 Over 9000 primary producer vehicles in Western Australia

Western Australia has **9225** farm haulage / primary producer registered vehicles.[32] This figure comprises:

- **8569** heavy farm haulage / primary producer vehicles (GVM of over 4.5 tonnes) [33]; and

[29] Data sourced from Queensland Department of Transport and Main Roads. This figure does not include Buses, Cars, Conditional Vehicles, Heavy Boat Trailers, Heavy Caravans, Heavy MM Trailers, Heavy Trailers, Mobile Machinery, Motorcycles, Motor Homes, and Other Trailers. Data as at 30 April 2013.

[30] Light vehicles include trucks and passenger vehicles with a GVM of 4.5 tonnes or less such as light trucks, commercial vehicles, and utility vans.

[31] National Farmers' Federation 2012, *NFF Farm Facts: 2012*, viewed 2 July 2013, <http://www.nff.org.au/farm-facts.html>.

[32] This is based on the number of farm haulage / primary producer vehicle concessions registered as at 4 April 2013, as reported by the Western Australia Department of Transport to Marsden Jacob.

- **656** vehicles weighing between 1524kg (1.5 tonnes) and 4500kg (4.5 tonnes).

Given that Western Australia has 10 889 farms[34], this suggests that on average, each farm owns approximately 0.9 vehicles and 0.79 heavy vehicles. However, we note that the total number of primary producer vehicles does not include vehicles that are less than 1.5 tonnes.

4.1.7 Over 29 000 primary producer vehicles in South Australia

As at the end of February 2013, there were **29 453** goods carrying vehicles registered under the primary producer category within South Australia.[35] This figure comprises both heavy vehicles and light vehicle types such as utilities, and van type bodies. As at June 2012, South Australia had **5805** heavy farm vehicles registered (GVM of over 4.5 tonnes).[36]

Given that South Australia has 12 464 farms[37], this suggests that on average, each farm owns approximately 2.4 vehicles, which is the highest farm vehicle ownership level across all the mainland states that were studied.

4.2 Heavy vehicle class profile

This section profiles the type of heavy vehicles used by New South Wales, Victorian and Queensland farmers (GVM of over 4.5 tonnes), based on information provided by state transport departments and/or road agencies in these states. The heavy vehicle categories reported by jurisdictions are consistent with the national charging definitions used by the National Transport Commission.

In presenting data in this section, we note that due to the different mix of industries across Australia, it may not be appropriate to draw generalisations for the whole of Australia based on the data from these three states.

This section shows that:

- across New South Wales, Victoria, and Queensland, rigid trucks typically make up about 80 per cent of all farm vehicle configurations with a GVM of over 4.5 tonnes. Articulated trucks make up the remaining 20 per cent of heavy vehicle configurations registered by farmers; and
- in New South Wales and Queensland, the number of rigid trucks registered has been declining over time and the number of articulated vehicles has been rising.

4.2.1 New South Wales: Declining number of rigid trucks

Figure 3 illustrates that the most common heavy vehicle form in New South Wales are rigid trucks with no trailers (totalling 13 591 vehicles in 2012, 74 per cent of all heavy vehicles), followed by short combination prime movers (2616 vehicles, 14 per cent).

A clearer picture of the movement in vehicle types excluding the rigid truck with no trailers is illustrated in Figure 4. Figure 4 shows that there is a steady rise in the number of multi-combination

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[33] The Western Australian Department of Transport have noted that there may be a margin of error of 1 to 2 per cent for the heavy vehicle figure and hence this may affect the number of those within the 1.524-4500kg vehicle category.

[34] National Farmers' Federation 2012, *NFF Farm Facts: 2012*, viewed 2 July 2013, <http://www.nff.org.au/farm-facts.html>.

[35] Data source from the South Australian Department of Planning, Transport and Infrastructure.

[36] Data sourced from the National Transport Commission.

[37] National Farmers' Federation 2012, *NFF Farm Facts: 2012*, viewed 2 July 2013, <http://www.nff.org.au/farm-facts.html>.

prime movers (medium and long combination prime movers), which has more than quadrupled since the year 2000. This rise has been accompanied by a 25 per cent fall in rigid trucks with no trailers (Figure 3). These results suggest that there has been a slight shift towards higher capacity vehicles over last ten years in New South Wales.

The New South Wales government (Transport for NSW) also provided the number of registered trailers. As at the end of 2012, there were 877 registered dog and pig trailers and 4601 semi-trailers and dolly trailers.

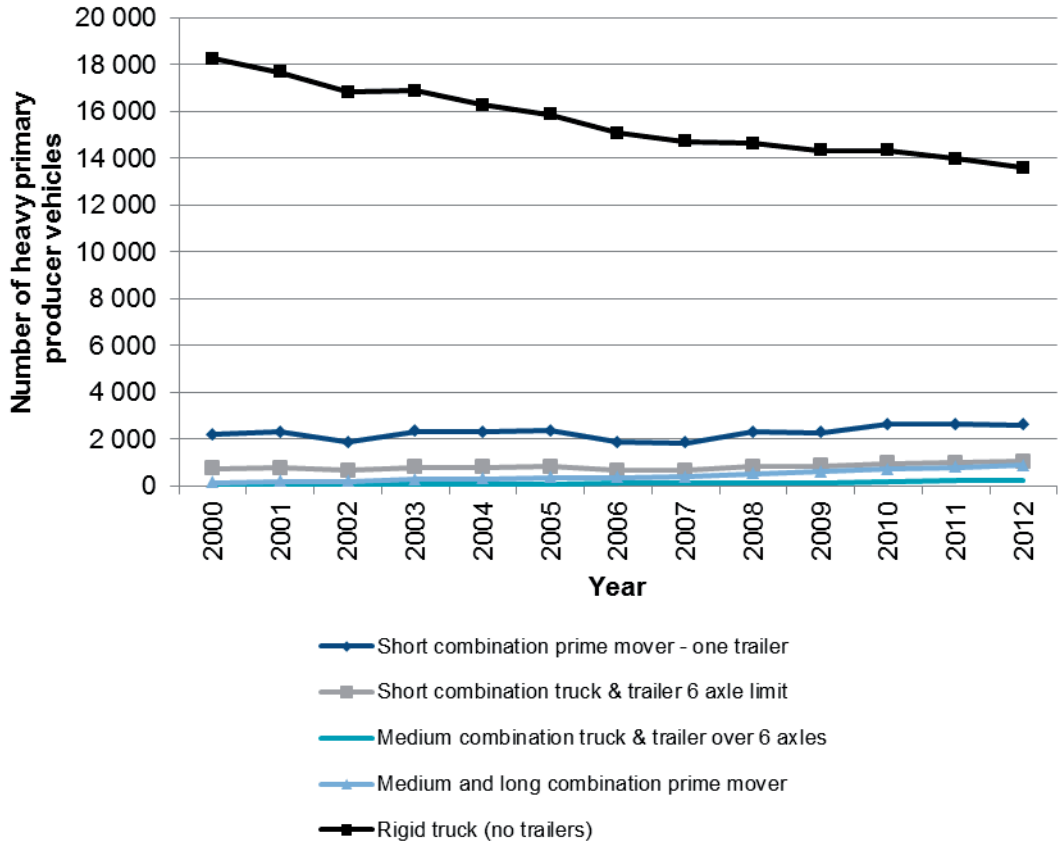

Figure 3: Breakdown of heavy primary producer vehicles (GVM of over 4.5 tonnes) registered in NSW, 2000-2012 (Transport for NSW)

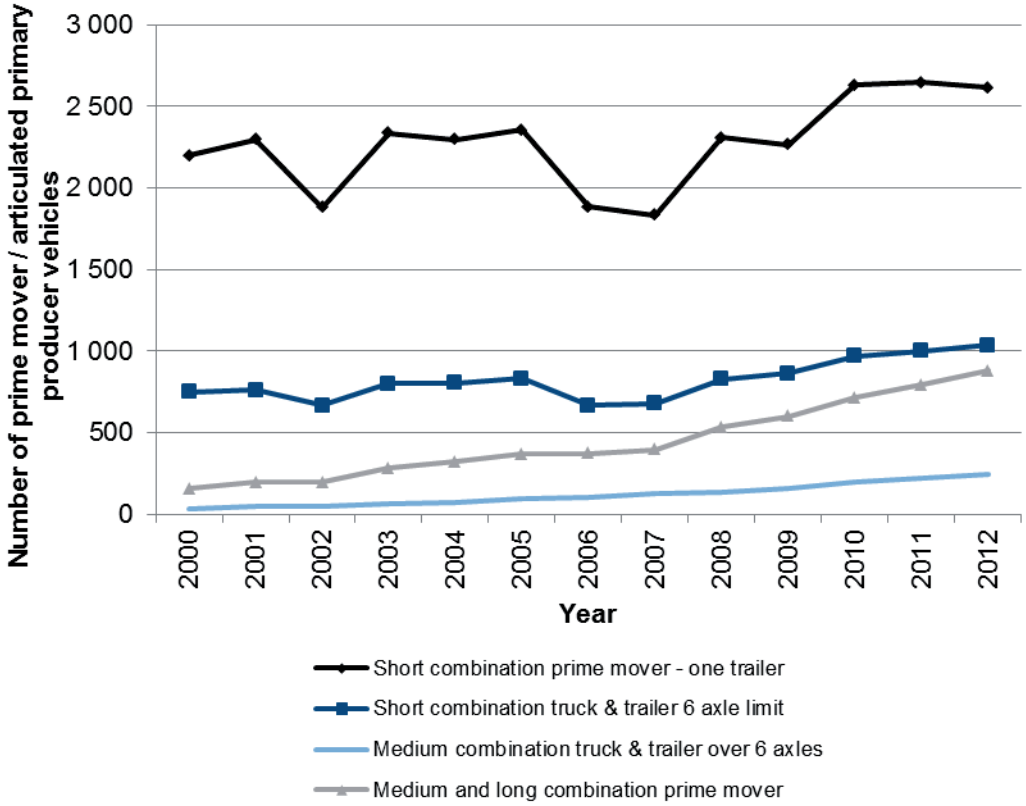

Figure 4: Prime mover / articulated primary producer vehicles (GVM of over 4.5 tonnes) registered in NSW – excluding rigid trucks with no trailers, 2000-2012 (Transport for NSW)

4.2.2 Victoria: More rigid trucks than articulated trucks

As stated above, in 2011, Victoria had **19 223** registered primary producer heavy vehicles.

Table 3 provides a breakdown of the types of registered primary producer heavy vehicles. Analysis of VicRoads data shows that the largest heavy vehicle sub-category is 2 axle rigid trucks with a GVM of less than 12 tonnes (8563 vehicles or 45 per cent of all heavy vehicles).

Data from VicRoads suggests that heavy semi-trailers (5236 in total) – in particular, 3 axle semi-trailers and 2 axle semi-trailers – were the most common forms of heavy trailers. Also of note is the number of pig trailers registered (1289 in total), with 2 axle and 3 axle pig trailers the most popular.

Table 3: Primary producer heavy motor vehicles registered in Victoria, as at October 2011

Heavy motor vehicle type	Total registered Number	Total registered %
2 axle rigid trucks (GVM < 12 tonnes)	8 563	45
2 axle rigid trucks (GVM > 12 tonnes)	3 560	19
3 axle rigid trucks (GVM < 16.5 tonnes)	215	1
3 axle rigid trucks (GVM > 16.5 tonnes)	1 857	10
4 axle rigid trucks (GVM < 20 tonnes)	1	0
4 axle rigid trucks (GVM > 20 tonnes)	257	1
Short combination trucks (< 42.5 tonnes with < 6 axles): 2 axle truck	186	1
Short combination trucks (< 42.5 tonnes with < 6 axles): 3 axle truck	388	2
Short combination trucks (< 42.5 tonnes with < 6 axles): 4 axle truck	34	0
Medium combination trucks (> 42.5 tonnes with > 6 axles): 2 axle truck	0	0
Medium combination trucks (> 42.5 tonnes with > 6 axles): 3 axle truck	58	0
Medium combination trucks (> 42.5 tonnes with > 6 axles): 4 axle truck	10	0
Prime mover for single semi-trailers: 2 axle prime mover	930	5
Prime mover for single semi-trailers: 3 axle prime mover	2 926	15
Prime mover for single semi-trailers: 4 axle prime mover	1	0
Prime mover for B-double: 2 axle B-double	0	0
Prime mover for B-double: 3 axle B- double	237	1
Prime mover for B-double: 4 axle B- double	0	0
Prime mover for B-double: 5 axle B- double	0	0
Total	**19 223**	**100**

Source: VicRoads.

Notes:

1. The total figure does not include Special Purpose Vehicles (such as mobile cranes, travel towers, drilling rigs, concrete pumps and fire trucks) or trailers.

4.2.3 Queensland: Rise in number of articulated trucks

Queensland has a total of **18 256** registered farm heavy vehicles. As shown in Figure 5, there are currently 15 719 rigid trucks and 2537 articulated trucks. Since 2009, the number of rigid trucks has decreased slightly by 2 per cent. However, the number of articulated trucks has risen by 12 per cent. The reason for this trend is unclear as we did not collect any data that explains the results.

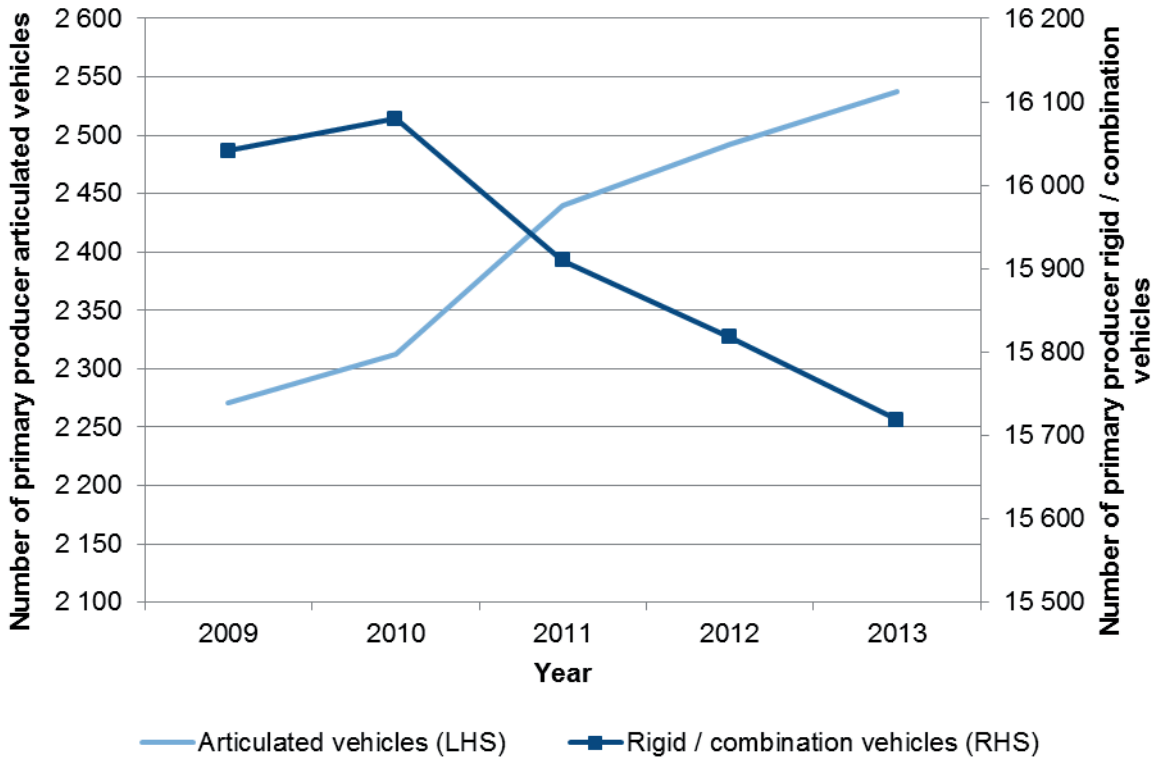

Figure 5: Farm heavy motor vehicles registered in Queensland, 2009-2013 (Queensland Department of Transport and Main Roads)

4.3 Other findings

This section discusses other findings from the desktop review that were within the scope of Marsden Jacob's review, including:

- Farmers operating own heavy vehicle;
- Distance travelled by farm vehicles;
- 'Last mile' /higher mass limit issues; and
- The livestock industry.

4.3.1 Farmers operating own heavy vehicle

A study by the National Transport Commission (NTC) in 2008 of forty eight farmers across Victoria, New South Wales, Queensland and Western Australia found that around 60 per cent of farmers

operated their own heavy vehicles. The remaining 40 per cent engaged freight forwarding / logistics companies to transport their goods.[38]

4.3.2 Distance travelled by farm vehicles

A 2006 NFF submission cites a 1988 Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) survey which indicated that the average farm truck travels a distance of 13 000 kilometres per year.[39]

4.3.3 'Last mile' / higher mass limits issues

The National Transport Commission Pilot Supply Chain Studies identifies the relevance of 'last mile' issues to the livestock industry.[40] As a number of processing facilities (such as abattoirs and major sale yards) are located in urban areas and are serviced by roads that are not Higher Mass Limits (HML) approved routes, this has led to some inefficiencies for transporting livestock.

Data from the National Transport Commission's Incremental Pricing study found that most farmers showed an interest in accessing roads that are currently restricted to them because of mass limits and having their trucks carry additional mass. [41] Among those that showed interest, they stated that benefits from this would be:

- cost effectiveness / higher profitability / lower running costs;
- time saving / efficiency / faster delivery / faster drop offs / shorter trips;
- the ability to carry more freight per vehicle / more payload / ability to supply more goods / deliver more;
- fuel efficiency / use less fuel / lower carbon emissions / environmentally friendly; and
- the ability to carry more freight per vehicle / more payload / ability to supply more goods / deliver more.

4.3.4 Livestock industry

In researching industry-specific transportation methods, we discovered that road is the primary mode of transportation used in the livestock supply chain[42]; however as the livestock industry supply chain is the most extensive in Australia in terms of distance and geographical spread, the transportation used by the livestock industry is diverse with a multitude of local and region-based carriers.[43] Data from the

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[38] National Transport Commission 2008, *Incremental Pricing: A National Study*, September, NTC, Melbourne.

[39] National Farmers' Federation 2006, *Productivity Commission – Road and Rail Freight Infrastructure Pricing – NFF Submission*, October, NFF, Canberra.

[40] National Transport Commission 2009, *Pilot Supply Chain Studies - Grain & Livestock: Stage Two Final Report*, February, NTC, Melbourne.

[41] National Transport Commission 2008, *Incremental Pricing: A National Study*, September, NTC, Melbourne.

[42] National Transport Commission 2009, *Pilot Supply Chain Studies - Grain & Livestock: Stage Two Final Report*, February, NTC, Melbourne.

[43] National Transport Commission 2008, *Livestock & Meat Supply Chain Pilot Study: Stage One Final Report*, December, NTC, Melbourne.

National Transport Commission's Incremental Pricing study found that among the 25 surveyed livestock farmers who operate their own truck (GVM of over 4.5 tonnes), most utilise rigid trucks.[44]

[44] National Transport Commission 2008, *Incremental Pricing: A National Study*, September, NTC, Melbourne.

5. Survey results

As part of the study into Australia's current agricultural transport fleet, Marsden Jacob, in collaboration with McNair Ingenuity Research, conducted a survey of farm businesses in Australia.

The survey sample was segmented into five groups as follows:

- Grains and oilseeds (Western Australia and South Australia);
- Grains and oilseeds (New South Wales, Victoria and Queensland);
- Livestock (New South Wales and Queensland);
- Fruit and nuts (New South Wales, Victoria and Queensland); and
- Dairy (Victoria).

Each of the five segments represented 20 per cent of the total sample size (43 respondents in each segment), and as individual categories, provides a reasonable level of statistical significance (15 per cent margin of error at a 95 per cent confidence level). As an aggregate, the survey results are statistically significant with a 7 per cent margin of error at a 95 per cent confidence level. Detailed data are provided in Appendix F.

Unless otherwise specified, the results from the farm survey are presented for combined light and heavy farm vehicles. The scope of the survey includes farm vehicles used for the purpose of transporting inputs and outputs on- and off-farm. The survey results indicate that:

- most farm businesses within all five segments surveyed own and operate between one and five farm vehicles (this includes both light and heavy vehicles). The dairy and livestock industries have a statistically higher proportion of farms that own and operate one or two vehicles than the two grain industry sectors;
- light commercial vehicles and heavy rigid trucks without trailers are the most common types of vehicles owned and operated by farmers across all five segments surveyed;
- almost all farm vehicles (this includes both light and heavy vehicles) operated by farm businesses are owned, rather than leased;
- heavy farm vehicles (greater than 4.5 gross tonnes) travel on average, across all five segments surveyed, around 13 000 kilometres per year;
- average fuel consumption as stated by farmers for each type of vehicle is broadly consistent with expectations;
- the average proportion of on-farm vehicle usage across the five industry segments is close to 50 per cent;
- most vehicles within each of the segments surveyed are registered all year round;
- the vast majority (69 per cent) of farm vehicles are eight years or older;
- around 40 per cent of vehicles operated by farmers are envisaged by farmers to be replaced in another eight years or more;
- ninety-two per cent of survey respondents stated that when they replace their current vehicle they will purchase the same vehicle type;

- over 50 per cent of operators of articulated vehicles, B-doubles and road trains stated that they do not use one tied configuration – rather they change vehicle configuration according to their freight needs;
- most vehicles travel around 38 per cent of their time on unsealed roads;
- the vast majority of vehicles do not participate in any mass concessional schemes or permits[45];
- fourteen per cent of survey respondents stated that they have issues with vehicle access along their transport routes that constrain their business (such as mass and vehicle type issues);
- for the grains and oilseeds industries, the greatest travel distance is attributed to transporting farm outputs to port terminals; for the livestock industry, 70 per cent stated that the next point in the supply chain is the sale yard; for those within the fruit and nuts industry, 33 per cent of respondents surveyed stated that the next point in the supply chain is the market[46]; most dairy farm businesses surveyed (79 per cent) stated that the next point in the supply chain was a processing plant; and
- apart from the dairy industry (where the buyer of the milk typically collects the produce directly from the farm), the other industries surveyed mostly transport their farm produce to the next point in the supply chain either via vehicles owned by the farm business or by an external party contracted by the farm business.

5.1 Survey market segments

Table 4 summarises the individual industry segments surveyed. As shown, 43 respondents were surveyed from each segment. As discussed in section 3, this sampling strategy provides statistically significant results for each segment at the 15 per cent margin of error at a 95 per cent confidence level.

Table 4: Survey segmentation

Market segment	NSW (Northern)	NSW (Southern)	VIC	QLD	SA	WA	Total
Grains and oilseeds (WA & SA)					20	23	**43**
Grains and oilseeds (NSW, VIC & QLD)	10	5	13	15			**43**
Livestock (NSW & QLD)	22			21			**43**
Horticulture – Fruit & Nuts (NSW, VIC & QLD)	3	12	13	15			**43**
Dairy (VIC)			43				**43**
Total	**35**	**17**	**69**	**51**	**20**	**23**	**215**

[45] Concessional schemes or permits enable heavy vehicles to operate outside of general access conditions, such as providing for over-long or over-mass vehicles.

[46] Compared to the other industries, the fruit and nuts industry has a more diverse range of types of places representing the next point in the supply chain.

Table 5 shows that among the 215 respondents surveyed, three of the seven respondents were not in the farming business five years ago and the remaining four were in other farming industries. Overall, there has been a notable shift into the grains and oilseeds industry, mostly from the livestock industry.

Table 5: Market segments - currently vs. five years ago

Market segment	Currently	Five years ago	Difference
Grains and oilseeds	86	77	+9
Livestock	43	47	-4
Horticulture – Fruit & Nuts	43	41	+2
Dairy	43	43	0
Total	**215**	**208**	**+7**

5.2 Number and types of farm vehicles owned and operated

Most of the farm businesses surveyed (88 per cent) own and operate between one and five vehicles (this includes both light and heavy vehicles) (see Figure 6). This includes both registered and non-registered vehicles, although section 5.7 indicates that almost all of these vehicles either have all year or seasonal registration. From a statistical perspective (at a 95 per cent confidence level), the dairy and livestock industries have a statistically higher proportion of farms that own and operate one or two vehicles than the two grain industry sectors (Figure 7).

Moreover, most of those surveyed within the livestock and dairy industries own and operate one or two vehicles, with 65 businesses within these industries owning between one and two vehicles (representing 76 per cent of total farm businesses surveyed in the livestock and dairy industries). The corollary of this is that those surveyed in the grains and oilseeds industry own and operate more vehicles than the other industries surveyed.

The survey also indicates that some farms own and operate a large number of vehicles. For example, almost 14 per cent of those vehicles surveyed within the grains and oilseeds (WA and SA) industry own and operate eight or more vehicles. It is unclear why this is the case, although farm size could play a role.

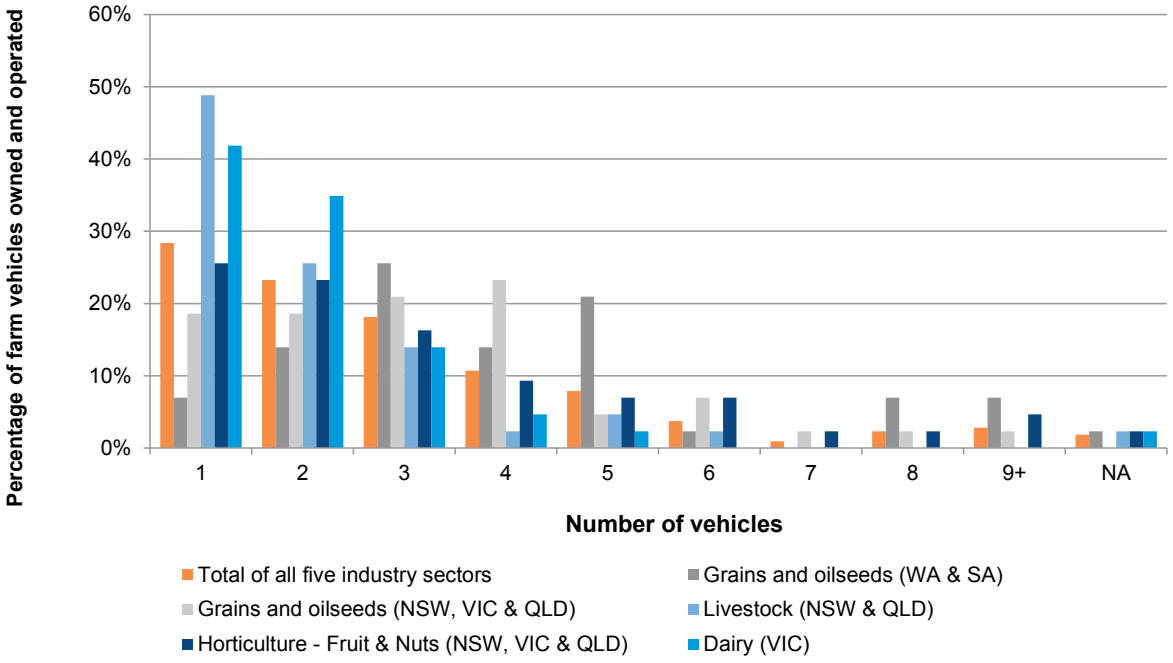


Figure 6: Number of farm vehicles owned and operated by industry segment

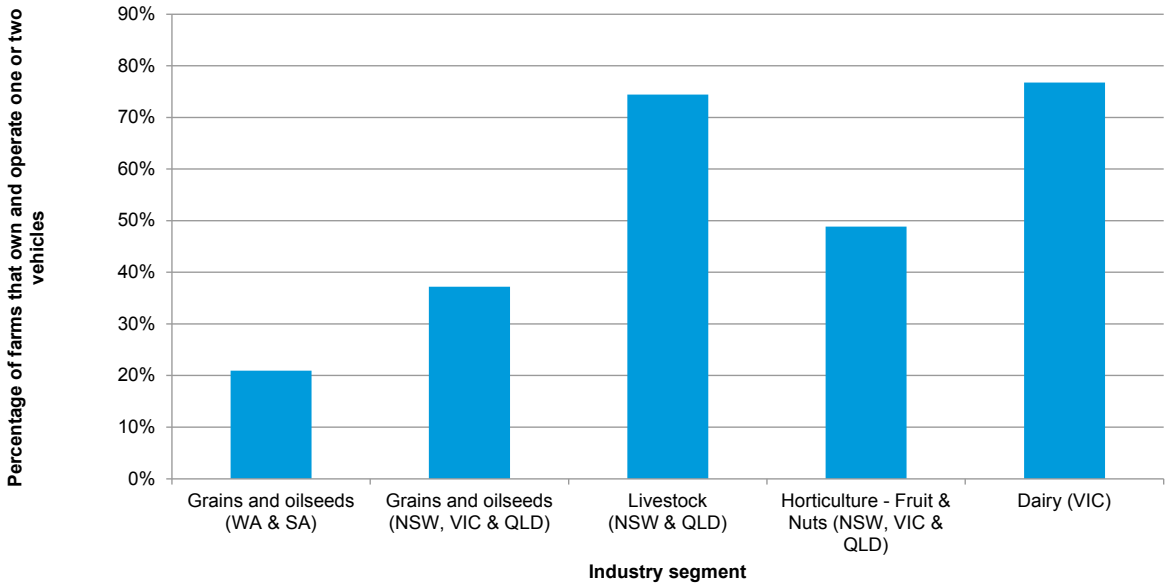


Figure 7: Percentage of farms that own and operate one or two vehicles

Figure 8 shows that in aggregate across the five segments surveyed[47], the most common types owned and operated by farmers are light commercial vehicles and heavy rigid trucks.[48] This appears to be a similar result across all five industry sectors.

[47] Note that light rigid trucks are vehicles 4.5 tonnes and greater gross vehicle mass. Heavy rigid trucks are vehicles greater than 4.5 tonnes gross vehicle mass.

[48] We are assuming that all of these vehicles are operational. This result is statistically significant at the 95 per cent confidence level.

Overall, the composition of rigid and articulated vehicles as owned by the farm business surveyed is consistent with the composition of the broader vehicle fleet (comprised of approximately 80 per cent rigid vehicles and 20 per cent articulated vehicles).[49]

From the vehicle numbers in the survey we have been able to derive an estimated number of farm heavy vehicles of 87 000, noting that this includes farm heavy vehicles that are both registered and not registered for use on public roads.[50] This is based on the results from the survey which show that there are 0.72 heavy vehicles (greater than 4.5 tonnes gross vehicle mass). This ratio is similar to the ratios reported for each of the five states in section 4.1. When light vehicles are included, the survey of farm businesses indicates that there are a total of 204 000 farm vehicles owned and operated by farm businesses in Australia.[51] We note that both of these figures do not include vehicles that are not owned by farmers but are used to transport goods to and from the farm.

Using survey results and data from state governments, we estimate that there are 150 000 heavy farm vehicles, which includes both registered and non-registered vehicles owned and operated by farm businesses and also those not owned and operated by farm businesses (such as contracted transport services).[52]

49 National Transport Commission 2012, Freedom of information request spreadsheet Option 3b, viewed 12 June 2013, < http://www.ntc.gov.au/ViewPage.aspx?DocumentId=2287>.

50 The estimated number of heavy farm vehicles of 87 000 is equal to the average number of heavy farm vehicles per farm business (0.72 vehicles) multiplied by 120 980 farms (sourced from Australian Bureau of Statistics publication 7121.0 for farms solely devoted to agriculture).

51 The total number of farm vehicles owned and operated by farm businesses (light and heavy vehicles) of 204 000 is based on the average number of farm vehicles per farm business derived from the survey (1.7 vehicles) and multiplied by 120 980 farms (sourced from Australian Bureau of Statistics publication 7121.0 for farms solely devoted to agriculture).

52 The estimated number of heavy farm vehicles (greater than 4.5 tonnes) plus those involved in transporting goods to and from farm of 150 000 is based on the ratio of owned vehicles versus vehicles not owned by farm businesses, taking into account the ratio of registered and non-registered vehicles. The 150 000 figure assumes that the average kilometres travelled by vehicles owned by farm businesses is the same as the average kilometres travelled by vehicles not owned by farm businesses. This assumption needs to be treated with caution as the focus of this study is on farm vehicles that are owned by farm businesses, and therefore it has not been tested.

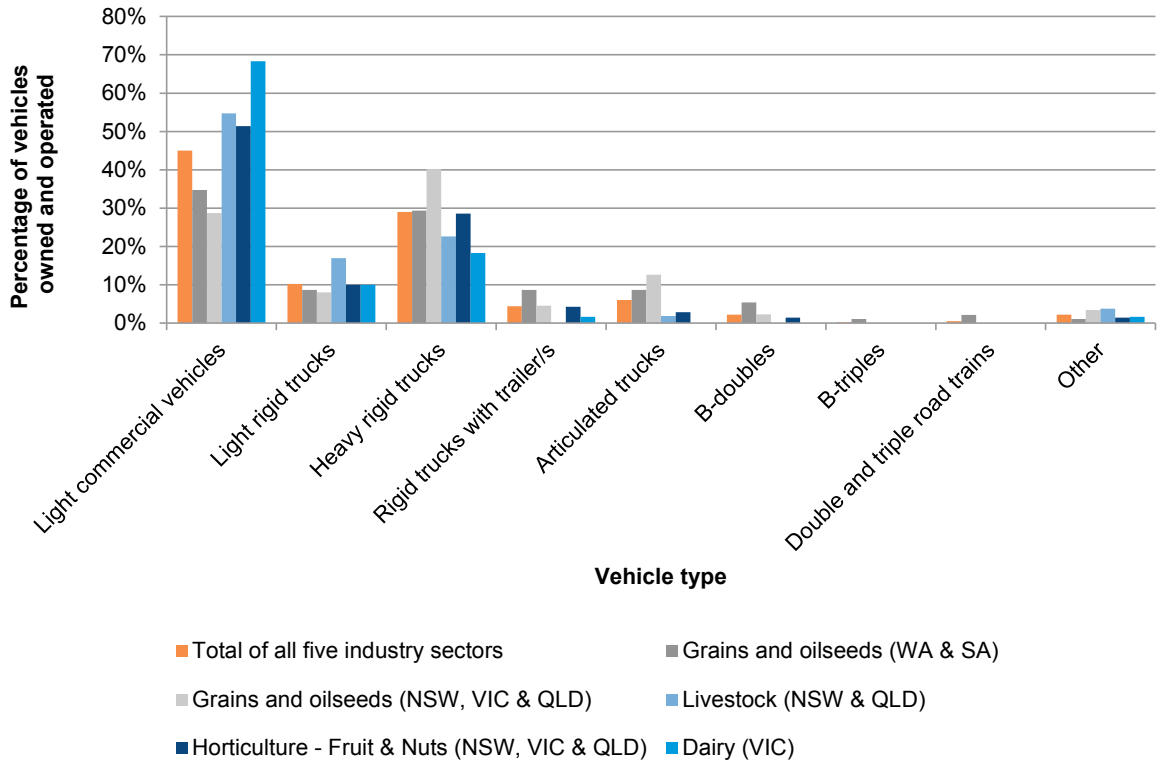


Figure 8: Types of farm vehicles owned and operated by segment

5.3 Owned or leased – currently versus five years ago

As shown in Figure 9, of the vehicles that are operated by farmers, almost all farm light and heavy vehicles used in Australian farm businesses are owned (97 per cent), with a very small proportion leased to farms. Within individual segments, similar ownership trends are evident.

Figure 8 also highlights that, overall, the proportion of vehicles owned and leased among farm businesses surveyed has remained unchanged over the last five years. This is also the case for all individual industry segments.

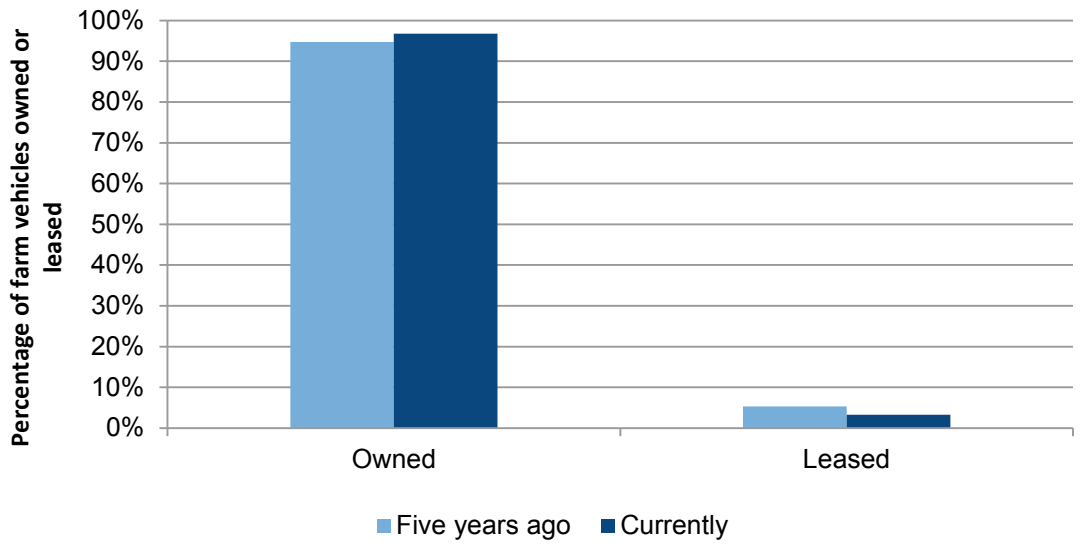


Figure 9: Farm vehicles owned and leased: Currently vs. five years ago

5.4 Distance travelled per vehicle

Overall, across all industries surveyed, the average distance travelled by all vehicles (light and heavy vehicles) is 16 000 kilometres each year. As shown in Figure 10, among the five segments surveyed and for all vehicles (light and heavy vehicles), those within the grains and oilseeds (WA & SA) segment travelled the most number of kilometres per year (on average 19 480 kilometres per annum), followed by those within the fruit and nuts industry (on average 17 963 kilometres per annum).

In terms of just heavy vehicles over 4.5 tonnes GVM (rigid and articulated vehicles), the survey results show that, in aggregate, heavy farm vehicles travel an average of 13 373 kilometres per year. Given the margin of error involved in the survey, this is likely to be statistically the same as the 2006 NFF submission which cites a 1988 Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) survey, indicating that the average farm truck travels a distance of 13 000 kilometres per year.[53]

The survey results show that, on average, rigid vehicles travel 10 234 kilometres and articulated vehicles travel on average 23 416 kilometres each year. This is significantly less than the broader population of heavy vehicles where rigid vehicles travel an average of 24 824 kilometres and articulated vehicles travel an average of 95 855 kilometres per year.[54] This provides some evidence that farm vehicles travel, on average, fewer kilometres per year for both rigid (greater than 4.5 tonnes gross vehicle mass) and articulated vehicles.

[53] National Farmers' Federation 2006, *Productivity Commission – Road and Rail Freight Infrastructure Pricing – NFF Submission*, October, NFF, Canberra.

[54] National Transport Commission 2012, Freedom of information request spreadsheet Option 3b, viewed 12 June 2013, < http://www.ntc.gov.au/ViewPage.aspx?DocumentId=2287>.

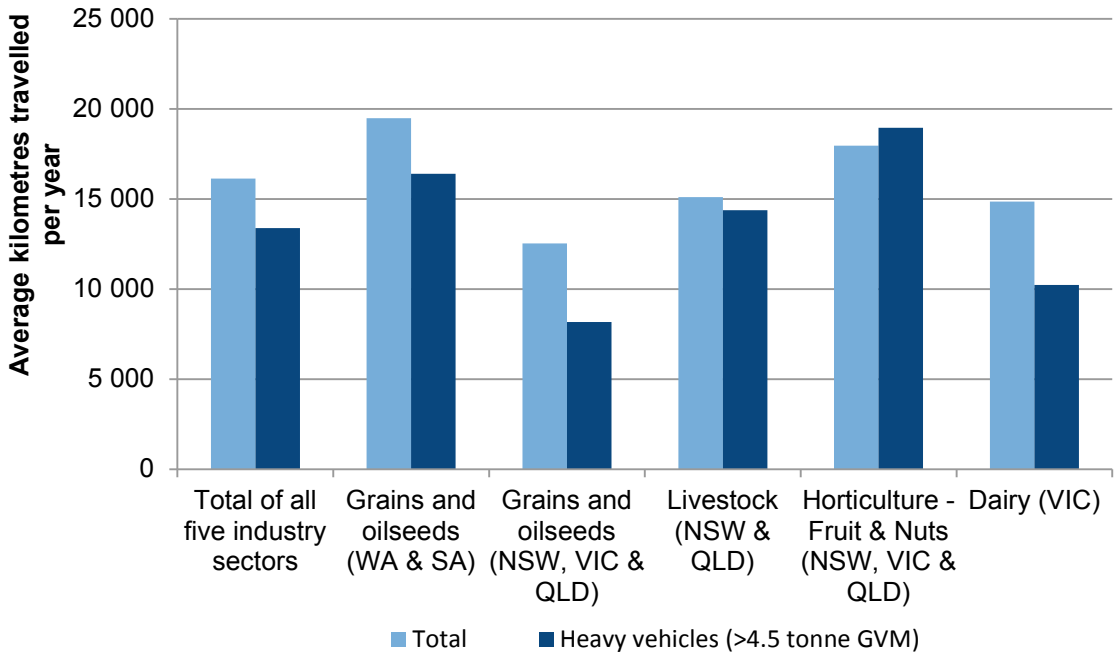


Figure 10: Average kilometres travelled per vehicle per annum

5.5 Fuel consumption

Most survey respondents (60 per cent) did not know their vehicles' fuel consumption. This may suggest that many survey respondents are not monitoring closely their vehicles' fuel consumption.

Table 6 provides fuel consumption estimates from respondents who were able to provide estimates on the fuel efficiency of their vehicles. These results show higher fuel consumption rates for larger vehicle configurations which is consistent with the trend observed in the ABS Survey of Motor Vehicle Use.[55] Due to low numbers of respondents who own heavier vehicles, the total number of responses for certain vehicle categories are particularly low; and hence should be treated with caution.

[55] ABS 2012, *Survey of Motor Vehicle Use*, Cat. no. 9208.0, Australian Bureau of Statistics, Canberra.

Table 6: Average fuel consumption

Vehicle type	Average fuel consumption Survey results L / 100km	Average fuel consumption ABS SMVU L / 100km
Light commercial vehicle <4.5 tonnes (n = 71)	11.2	11.6
Light rigid truck <4.5 tonnes (n = 9)	13.7	15.8
Heavy rigid truck >4.5 tonnes (n = 26)	20.2	30.0
Heavy rigid truck plus trailer >4.5 tonnes (n = 4)	25.3	43.2
Articulated - prime mover plus trailer (n = 7)	45.0	50.3
B-double (n = 2)	50.1	58.7
B-triple (n = 1)	50.0	
Double and triple road trains (n = 2)	50.0	71.7

Source: Survey results and ABS SMVU (Australian Bureau of Statistics Survey of Motor Vehicle Use 2010) data which is summarised in National Transport Commission (2012), Freedom of information request spreadsheet 2010 VKT and fuel consumption data, viewed 1 July 2013, < http://www.ntc.gov.au/ViewPage.aspx?DocumentId=2287>.

5.6 Vehicle usage on-farm

Almost all vehicles are used for both on-farm and off-farm transport (Figure 11). On-farm use is where the farmer uses the vehicle on the farm property. Off-farm use is where the farmer uses the vehicle to transport inputs to the farm or outputs from the farm to the next point in the supply chain.

The survey results also show that the average proportion of on-farm vehicle usage[56] across the five industry segments is close to 50 per cent (with a margin of error of +/-7 per cent with a 95 per cent degree of confidence), with the industry segment proportions varying between 40 and 60 per cent. The proportions for the various segments are not statistically different from one another.

[56] Note that the proportion of travel on unsealed roads was estimated using the mid-points of the ranges that were asked within the survey question (e.g. the mid-point of 10 to 25 per cent is 17.5 per cent).

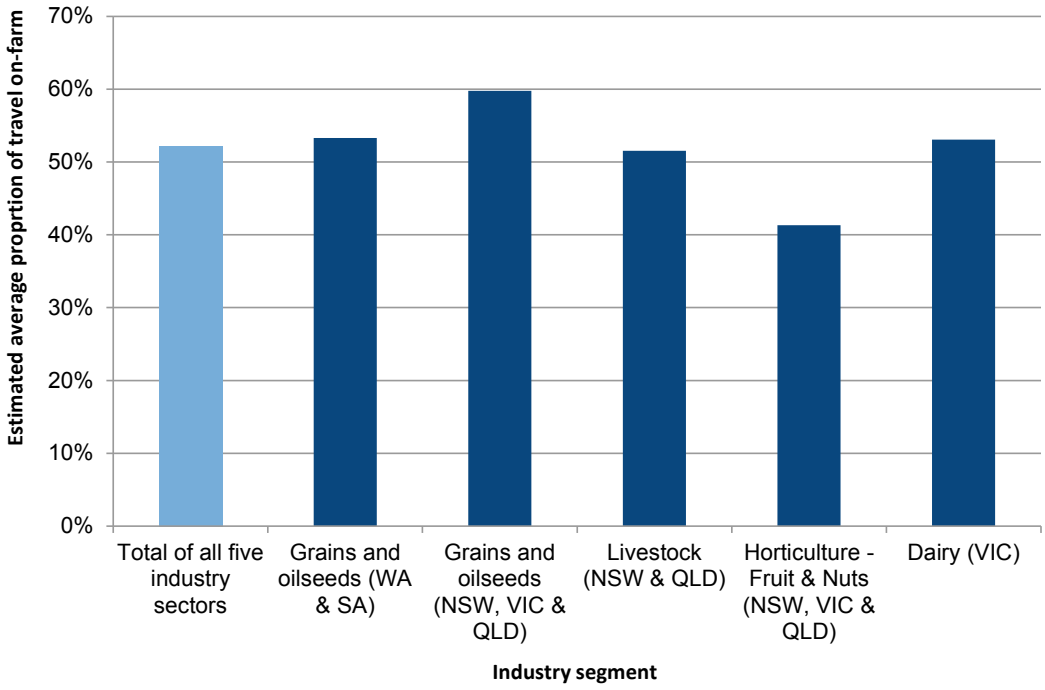


Figure 11: Vehicle usage on-farm

5.7 Registration

As shown in Figure 12, most vehicles within each of the segments surveyed are registered all year round. The results from the survey also show that there are a slightly lower number of all year round registrations among those in the grains and oilseeds industry (NSW, VIC and QLD) relative to the other industry sectors. Although this is not statistically significant, it does warrant further investigation. It is possible that the lower number in this market segment is because of the use of seasonal registrations, which is likely a result of some vehicles only being required during harvesting periods and/or only being required for on-farm use.

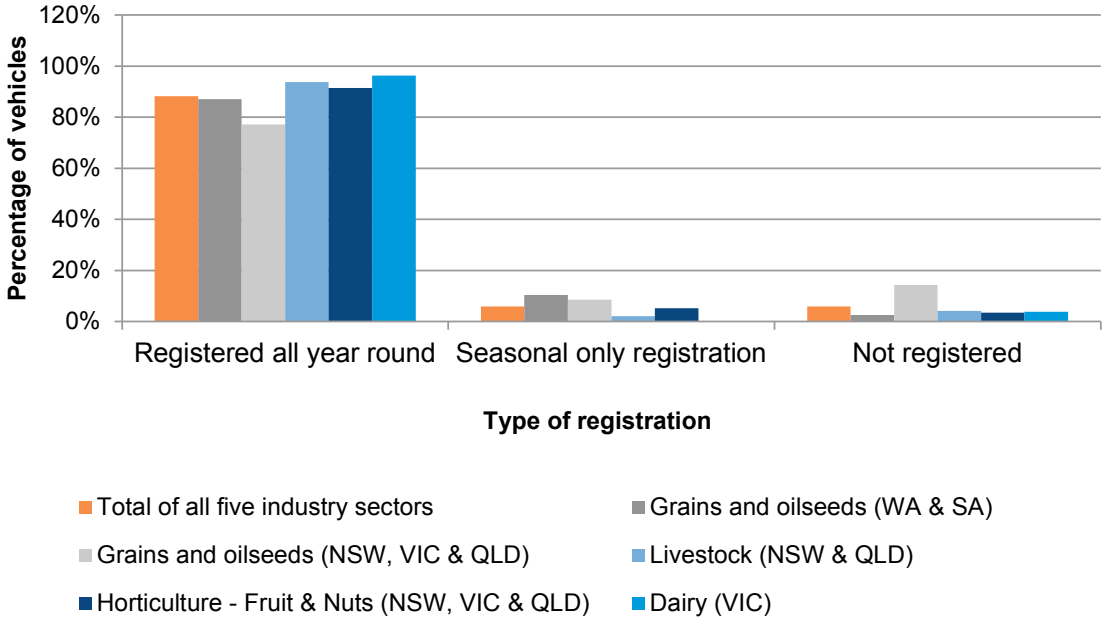


Figure 12: Vehicle registration

5.8 Age of vehicle

The age of vehicles is important for a number of reasons, including its implications for vehicle efficiency, environmental impacts and safety. The vast majority of farm vehicles (69 per cent) reported in the survey are eight years or older (Figure 13 – which illustrates the age of vehicles in age brackets). Moreover, the proportion of vehicles that are eight years or older does not vary by much across the five industry sectors.

The survey also shows that there is evidence that farm vehicles are not being replaced as frequently as the broader vehicle population. This is shown by the proportion of farm vehicles that are fewer than five years old being less than the general vehicle population. This is shown in Figure 14 and is true for both heavy farm vehicles (greater than 4.5 gross vehicle mass) and all farm vehicles (light and heavy). This result in statistically significant since the margin of errors in our farm survey for heavy farm vehicles as a category and for all farm vehicles are both less than 10 per cent.

This result is not entirely surprising since we showed in section 5.4 that the average kilometres travelled by heavy farm vehicles (rigid and articulated vehicles) is much less than the broader heavy vehicle population. Therefore, we would expect heavy farm vehicles to last longer since they travel much less kilometres each year compared to the broader heavy vehicle population.

Given the survey results, it might be useful in the future to collect more detailed data on the age of vehicles that are eight years and older.

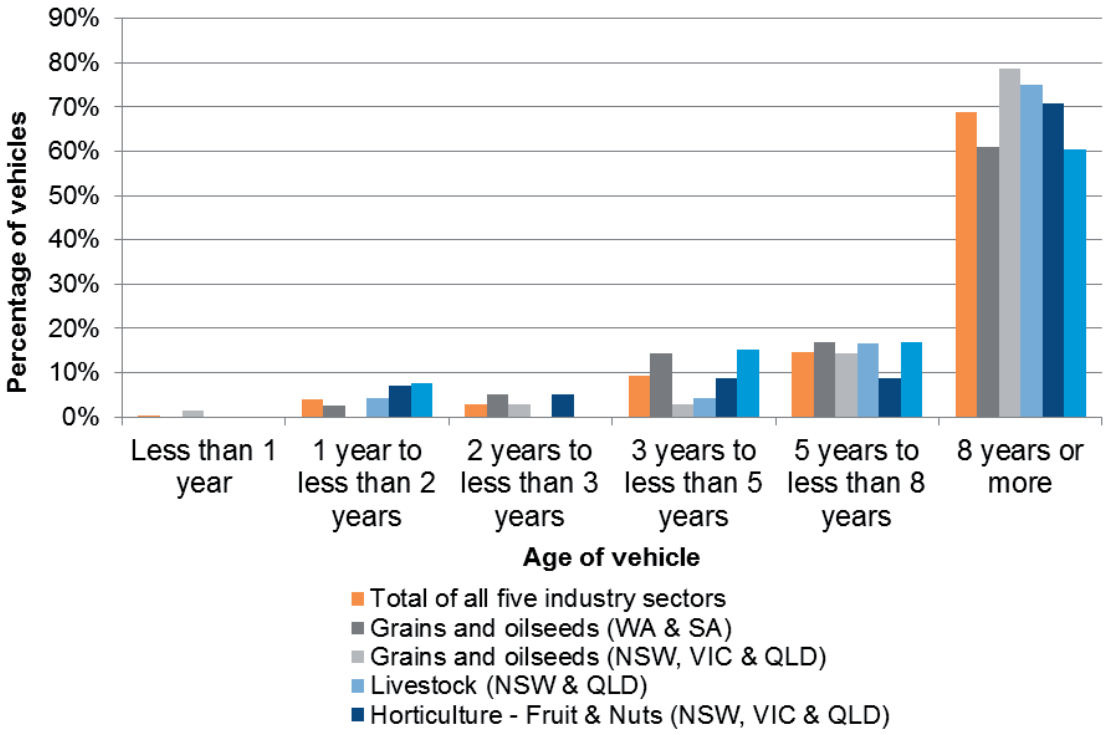


Figure 13: Age of vehicles

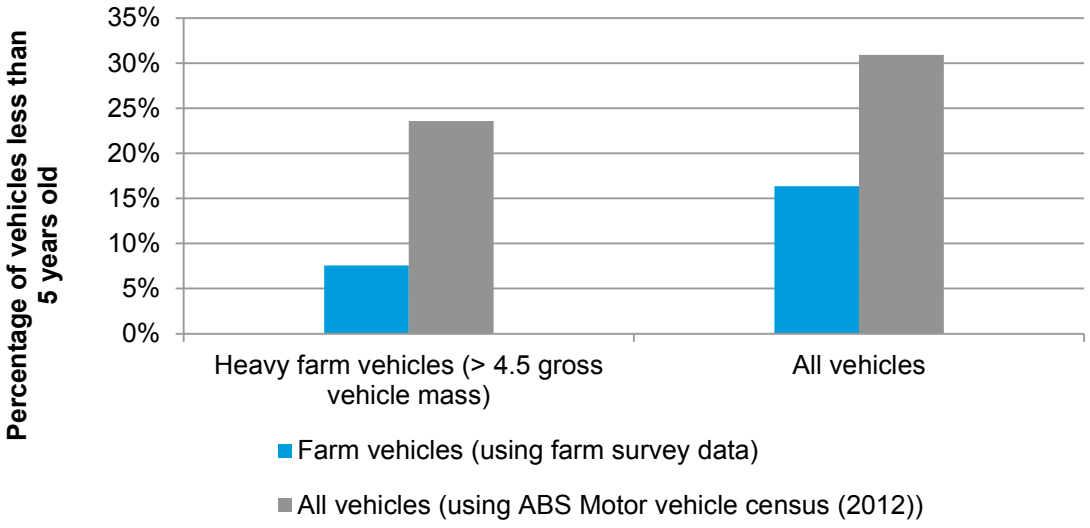


Figure 14: Comparison of proportion of vehicles aged 5 years or less to general vehicle population

Source: The age of the general vehicle population was sourced from the Australian Bureau of Statistics Motor Vehicle Census 2012, which records data on all vehicles registered.

5.9 Planning to replace a vehicle

Across all industry segments, when asked when they plan to replace their vehicles, the most common response was for the eight years or more age category. This is statistically significant (at a 95 per cent confidence level) as the most common category. Noticeably, all the other sectors had a similar spread of responses across age categories, with some noticeably exceptions (e.g. the low proportion for dairy farmers in the eight year or more category.

These results appear to be consistent with the results in the previous section which indicated that farm vehicles last longer than the broader vehicle population.

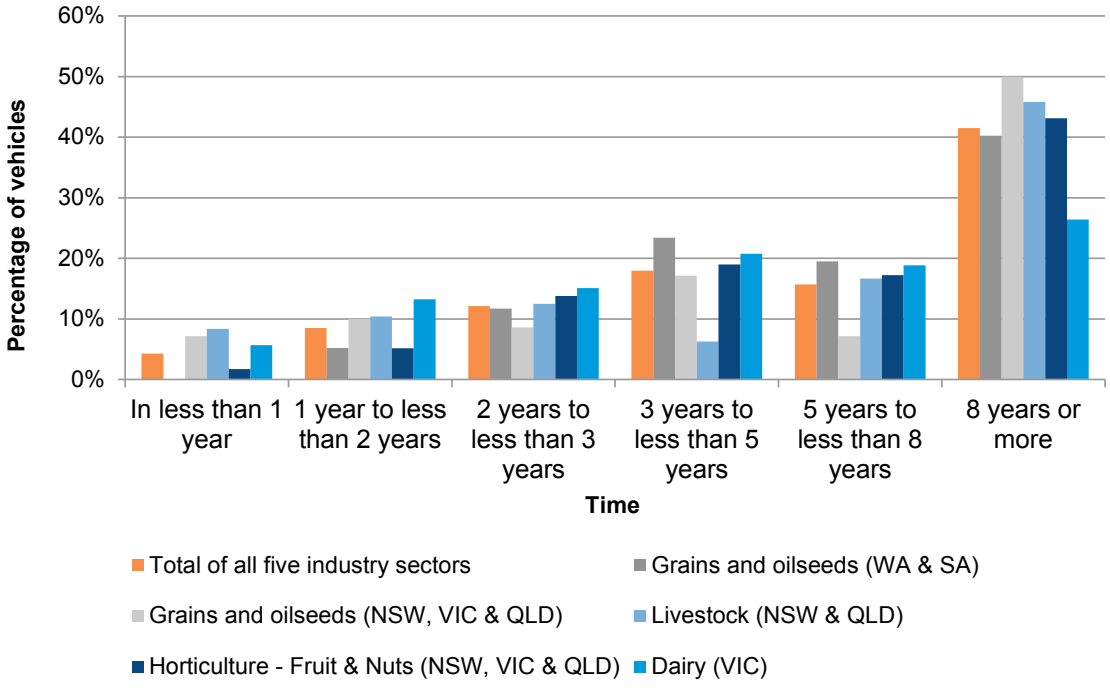


Figure 15: Plan to replace vehicles

5.10 Vehicle replacement intentions

When asked what vehicle they would replace the vehicle with, 92 per cent of survey respondents stated that they would replace their current vehicle with the same type. A total of 8 per cent (6 respondents) stated that they would replace their current vehicle with another type – this varied between smaller and heavier vehicles.

5.11 Configuration

Respondents with articulated, B-double, or road trains were asked whether they typically use their vehicles in one tied configurations or different configurations depending on the freight task. As shown in Figure 16, among the 30 respondents, 57 per cent (17 respondents) stated that they change configurations according to their freight needs. For example, a road freight operator could be using a semi-trailer as part of different vehicle configurations depending on the freight task – one day it could be used in a six-axle articulated vehicle configuration (in which case it is the only trailer) and another day it could be used in a B-double vehicle configuration (in which case the semi-trailer is one of two trailers used in the configuration). Similarly, a prime mover could be able to be used as part of a single trailer articulated configuration (e.g. six-axle articulated) or as part of a B-double or road train vehicle class.

Further surveying could be undertaken to determine exactly how trailers and prime-movers are used in different vehicle configurations and the reason for the changes to configuration.

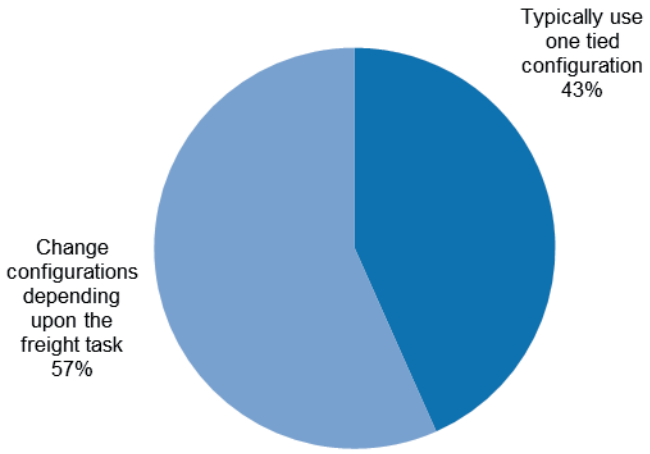


Figure 16: Vehicle configuration across all industry sectors

5.12 Travel on unsealed roads

Unsealed roads include all roads with no waterproof or structural surfacing (i.e. without a bituminous or concrete surface).[57]

As shown in Figure 17, the overall estimated proportion of travel on unsealed roads is around 38 per cent.[58] The survey results show that there are some differences across sectors. However, these differences are not statistically significant at the 95 per cent confidence level, since a 15 per cent margin of error is associated with the sample size for each industry (with a sample size of 43 farms).

Of note is that the horticulture sector appears to have lower travel on unsealed roads compared to the other sectors. However, further sampling is required to statistically validate this result at the 95 per cent confidence level. We note that the result is statistically valid if we assume a lower confidence level (say 80 to 85 per cent). The lower result for the horticulture industry could be because farms in this sector are located closer to urban areas than the other industries or that they mainly utilise major highways/freeways for a large part of travel from and to the farm.

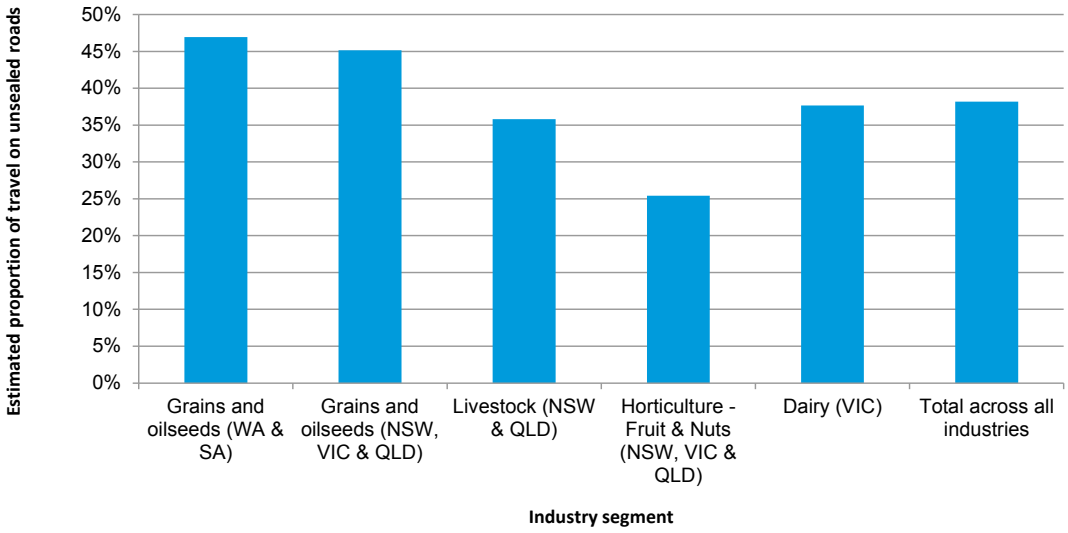


Figure 17: Travel on unsealed roads across all industry sectors

[57] Road and Traffic Authority (NSW) 2006, *Road environment safety: A practitioner's reference guide to safer roads, Roads and Traffic Authority*, January, Roads and Traffic Authority, Sydney.

[58] Note that the proportion of travel on unsealed roads was estimated using the mid-points of the ranges that were asked within the survey question (e.g. the mid-point of 10 to 25 per cent is 17.5 per cent).

5.13 Mass concessional schemes / permits

An important factor of road charging policy is the consideration of mass limits. The survey found that the vast majority of vehicles did not participate in any mass concessional schemes or permits (Figure 18). Concessional schemes or permits enable heavy vehicles to operate outside of general access conditions, such as providing for over-long or over-mass vehicles.[59] Mass concessional schemes allow vehicles to travel at a gross mass greater than generally allowed mass limits.

From a statistical perspective, the proportion of survey respondents participating in mass concessional schemes (such as higher mass limits or concessional mass limits) is much less than those that do not participate in such schemes. It is also apparent that no respondents in the dairy sector indicated that they are participating in mass concessional schemes or were using permits for greater vehicle access. Additionally, we can say with statistical certainty (at a 95 per cent confidence level) that across all industries, more than half of farm vehicles do not participate in any form of mass concessional scheme or other permit arrangement.

Some survey respondents indicated that they participate in 'other' mass concessional schemes or permits. Upon close inspection of individual responses, it appeared that these are not mass concessional schemes or permits, but rather primary producer concessions, remote area concessions, seasonal registration, fuel rebates, and so on.

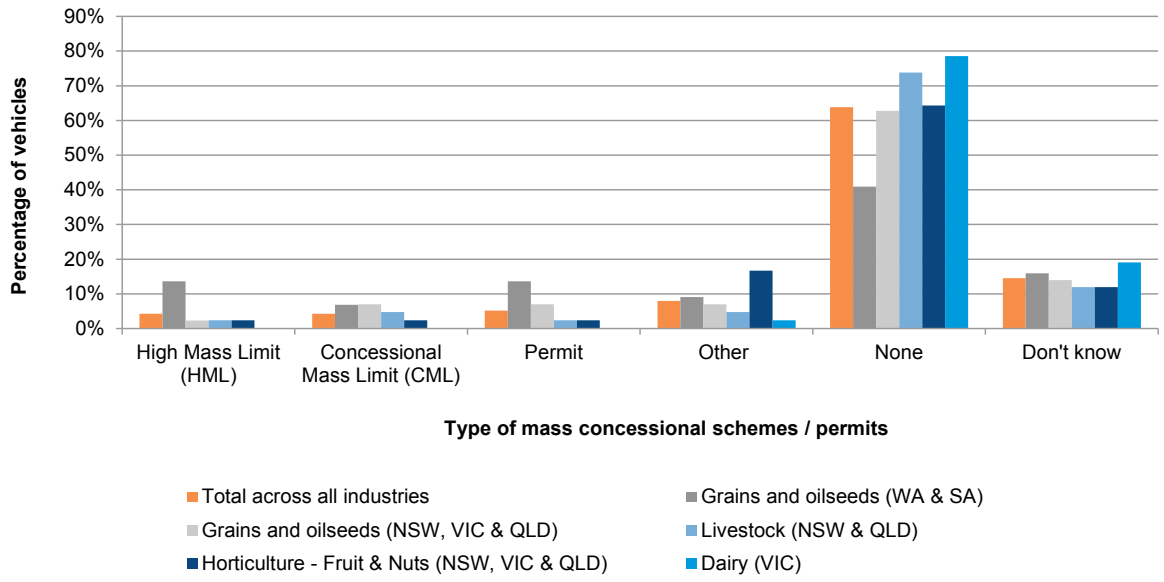


Figure 18: Participation in mass concessional schemes and/or permits

[59] Note that mass concessional schemes and permits relate to vehicle access and have no direct relationship with the vehicle registration charges paid by farmers. Moreover, farmers can apply for a primary producer concession on their registration charges, which is not related to whether they are involved in a mass concessional scheme or other permit arrangement.

5.14 Access issues

The access to some roads in Australia is restricted according to the type of vehicle and by maximum mass limits. When asked if any road access issues were experienced, 31 respondents (mostly from the grains and oilseeds industry) out of all 215 respondents surveyed provided comments on vehicle issues. These respondents stated that they have issues with vehicle access along their transport routes that constrain their business (such as mass and vehicle type issues). Table 7 lists the types of road access issues experienced by farmers in operating their vehicles. The most common issues are related to the inconvenience of reconfiguring vehicles and seeking alternative routes, as well as poor conditions of roads that do not cater for heavy vehicle access. Due to low numbers of respondents for some of the responses, these particular results should be treated with caution.

Table 7: Access issue comments

Access issue comments
Problems with road access (e.g. roads are restricted for certain heavy vehicle types, B-double truck routes) (n = 13)
Poor condition of roads (e.g. asphalt needs to be replaced, narrow seals, lack of slip lanes for turning, narrow roads, bumps and holes in road which affects agricultural product and vehicle suspension) (n = 12)
Unsealed road (dirt road) is unsafe to drive on when it rains (n = 3)
Problems with overhanging trees and branches and animals (n = 3)

5.15 Next point in supply chain for farm outputs and average distance

Our survey examined the next point in the supply chain for farm outputs. Table 8 shows that from a statistical point of view (at a 95 per cent confidence level with a 15 per cent margin of error) we can make the following conclusions about the next point in supply chain for farm outputs:

- Grains and oilseeds
    - for the grains and oilseeds industries, the most common next point in Western Australia and South Australia is transporting farm outputs to storage facilities (not owned by the farmer – e.g. bulk handling storages). This is to be expected given that a much higher proportion of grains are exported in Western Australian and South Australia than the eastern states – and that grain in bulk handling storage facilities will be transported to a port terminal;
    - for grains and oilseeds harvested in New South Wales, Victoria and Queensland the most common point is also storage facilities (not owned by the farmer – e.g. bulk handling facilities). However, there is also a lower but statistically significant proportion of grains being transported to flour mills; and
    - we note that we did not obtain any responses for flour mills. However, it is likely the case that many flour millers are buying grain located at the bulk handling storage facilities and not directly from farmers.
- Livestock
    - the large majority of livestock farm businesses surveyed indicated that the next point in the supply chain is the sale yard, with a smaller proportion indicating that they transport outputs to a processing plant (e.g. abattoir); and

- Fruits and nuts

    - there are a range of next points in the supply chain for the fruit and nuts sector, the major ones being market and processing/packaging plants. The “other category” includes a range of categories, such as wineries, distributors, shops and sugar mills.

- Dairy

    - the large majority of dairy farm businesses surveyed (79 per cent) stated that the next point in the supply chain was a processing plant. This is to be expected since dairy farm outputs are typically used for milk and cheese products.

Note that we have included the average distances in the table below. These should be treated with caution given the low sample numbers in each sector. The average distances that have the most statistical validity are those with high sample numbers, such as storage facilities in both grain sectors, sale yard in the livestock sector and processing plant in the dairy sector.

Table 8: Next point in the supply chain for farm outputs and average distance

Next point in supply chain	Grains & oilseeds (WA & SA)	Grains & oilseeds (NSW, VIC, & QLD)	Livestock (NSW & QLD)	Fruit & nuts (NSW, VIC, & QLD)	Dairy (VIC)
	n = 43	n = 43	n = 43	n = 43	n = 43
	Percentage	Percentage	Percentage	Percentage	Percentage
Flour mill	5%	0%	n/a	n/a	n/a
Distance	60 km	-	n/a	n/a	n/a
Feed mill	0%	19%	n/a	n/a	n/a
Distance	-	141 km	n/a	n/a	n/a
Processing plant (e.g. abattoir for livestock)	n/a	n/a	23%	30%	79%
Distance	n/a	n/a	90 km	41 km	52 km
Storage facility	65%	51%	n/a	5%	n/a
Distance	38 km	29 km	n/a	51 km	n/a
Port terminal	21%	12%	n/a	n/a	n/a
Distance	72 km	273 km	n/a	n/a	n/a
Port terminal for live export	n/a	n/a	0%	n/a	n/a
Distance	n/a	n/a	-	n/a	n/a
Sale yard	n/a	n/a	70%	n/a	n/a
Distance	n/a	n/a	53 km	n/a	n/a
Market	n/a	n/a	n/a	33%	n/a
Distance	n/a	n/a	n/a	304 km	n/a
Produce picked up on farm for unknown destination	7%	7%	2%	7%	9%
Distance	19 km	19 km	214 km	165 km	48 km
Other	2%	12%	5%	26%	12%
Distance	25 km	121 km	400 km	28 km	32 km
Total	**100%**	**100%**	**100%**	**100%**	**100%**
Overall average distance	**43 km**	**86 km**	**74 km**	**143 km**	**49 km**

Note: Some of the percentages may not total to 100 per cent due to rounding.

5.16 Type of transportation used for moving farm produce to next point in supply chain

Our survey examined the type of transportation used for moving farm produce to the next point in the supply chain. As shown in Table 9, apart from the dairy industry, most farmers transport their farm produce to the next point in the supply chain either via vehicles owned by the farm business or by an external party contracted by the farm business.

For the dairy sector, we can conclude that the major transportation type to move produce to the next point in the supply chain is by the buyer of the outputs. For the other three industries (grains and oilseeds, livestock, and fruit and nuts) we cannot conclude from a statistical perspective that the proportion of vehicles owned by the farm business is different to the proportion transported using an external party contracted by the farm business.

Table 9 shows that over the last five years, the trend in transportation methods has been rather static across each of the sectors and as a whole in terms of contracting out services to an external party. This trend indicates that there is no evident trend in the types of transportation methods used to transport farm produce to the next point in the supply chain. The survey results suggest there may have been a slight increase in the use of contracted transportation services within the grain and oilseeds industry in Western Australia and South Australia compared to five years ago; however the small survey sample means that this observation needs to be understood in this context.

The results for the grains and oilseeds (WA & SA) segment are broadly consistent with findings from the desktop review which indicated that around 60 per cent of farmers operated their own heavy vehicles and that the remaining 40 per cent engaged freight forwarding / logistics companies to transport their goods. [60] For the livestock segment, this trend appears to be reversed, and for the grains and oilseeds (NSW, VIC & QLD) and fruit and nuts (NSW, VIC & QLD) segments, results do not indicate a statistical difference between the use of external transportation services and the use of vehicles owned by the farm.

[60] National Transport Commission 2008, *Incremental Pricing: A National Study*, September, NTC, Melbourne.

Table 9: Type of transportation and average percentage of travel of farm produce to next point in the supply chain – currently vs. five years ago

Type of transportation to next point in supply chain	Grains & oilseeds (WA & SA)	Grains & oilseeds (NSW, VIC, & QLD)	Livestock (NSW & QLD)	Fruit / nuts (NSW, VIC, & QLD)	Dairy (VIC)
	n = 43	n = 43	n = 43	n = 43	n = 43
	Percentage	Percentage	Percentage	Percentage	Percentage
By vehicles owned by the farm					
Currently	56%	38%	32%	49%	11%
Five years ago	59%	43%	35%	48%	12%
Difference	*-3%*	*-5%*	*-3%*	*1%*	*-1%*
By vehicles leased to the farm					
Currently	0%	1%	1%	0%	0%
Five years ago	0%	1%	0%	0%	0%
Difference	*0%*	*0%*	*+1%*	*0%*	*0%*
By external party contracted by farmer					
Currently	44%	47%	63%	38%	5%
Five years ago	39%	49%	62%	37%	7%
Difference	*+5%*	*-2%*	*+1%*	*1%*	*-2%*
By buyer of outputs					
Currently	0%	8%	0%	11%	70%
Five years ago	0%	5%	0%	11%	65%
Difference	*0%*	*+3%*	*0%*	*0%*	*+5%*
Other					
Currently	0%	6%	4%	2%	14%
Five years ago	2%	2%	4%	5%	16%
Difference	*-2%*	*+4%*	*0%*	*-3%*	*-2%*

5.17 Type of transportation used for transporting major farm inputs onto farm

From a statistical point of view (assuming a 15 per cent margin of error at a 95 per cent confidence level), we can make the following conclusions about the type of vehicle used for transporting major farm inputs onto farms (see Table 10):

- for the grains and oilseeds industry (across all five states sampled - Western Australia, South Australia, New South Wales, Victoria and Queensland), the two main methods are by use of their own vehicle or via an external party contracted by the farmer (noting that combining all five states together reduces the margin of error from 15 per cent to 11 per cent). There are a small proportion of farmers which use the seller of the input to transport inputs to the farm;

- for the livestock industry (New South Wales and Queensland), the major type used to transport inputs to farm is by vehicles owned by farmers; although this is not statistically different from an external party undertaking this freight task;

- for the fruit and nuts industry (New South Wales, Victoria and Queensland), there does not appear to be a statistical difference between the number of farms who transport their inputs using their own vehicle and those that have it transported to the farm by the seller of the inputs; and

- for the dairy industry, the survey results indicate that there are more farm businesses that have their inputs delivered by the seller and less that transport the inputs with their own vehicle or by a contracted external party.

These results indicate that the fruit and nuts and dairy industries are more reliant on inputs being transported to the farm by the seller of the inputs than the grains and livestock sectors. The reasons for this have not been explored in this study and require further research.

Additionally, since five years ago, there have been no noticeable trends in transportation methods for major farm inputs onto farm. The proportions of transportation methods have remained fairly static across each of the industry sectors and as a whole in terms of contracting out to external transportation services.

Table 10: Type of transportation and average percentage of travel of major farm inputs onto farm – currently vs. five years ago

Type of transportation used for transporting major farm inputs onto farm	Grains & oilseeds (WA & SA)	Grains & oilseeds (NSW, VIC, & QLD)	Livestock (NSW & QLD)	Fruit / nuts (NSW, VIC, & QLD)	Dairy (VIC)
	n = 43	n = 43	n = 43	n = 43	n = 43
	Percentage	Percentage	Percentage	Percentage	Percentage
By vehicles owned by the farm					
Currently	51%	44%	57%	46%	16%
Five years ago	49%	43%	57%	47%	17%
Difference	*+2%*	*+1%*	*0%*	*-1%*	*-1%*
By vehicles leased to the farm					
Currently	2%	1%	0%	0%	0%
Five years ago	0%	0%	0%	0%	0%
Difference	*+2%*	*+1%*	*0%*	*0%*	*0%*
By external party contracted by farmer					
Currently	38%	42%	31%	17%	22%
Five years ago	38%	40%	32%	18%	20%
Difference	*0%*	*+2%*	*-1%*	*-1%*	*+2%*
By seller of inputs					
Currently	9%	13%	10%	37%	62%
Five years ago	12%	16%	10%	32%	55%
Difference	*-3%*	*-3%*	*0%*	*+5%*	*+7%*
Other					
Currently	0%	0%	2%	0%	0%
Five years ago	1%	1%	2%	2%	8%
Difference	*-1%*	*-1%*	*0%*	*-2%*	*-8%*
Total	**100%**	**100%**	**100%**	**100%**	**100%**

5.18 Reasons why forms of transportation have changed significantly over last five years

A small number of respondents who have indicated that their forms of transportation have changed (i.e. owned, leased, contracted and so on) significantly over the last five years (particularly towards contracted transportation services) have provided reasons for this change have stated the reasons for this change. These responses are shown in Table 11. The small response numbers mean that responses are illustrative, but not necessarily representative, of industry views.

Table 11: Reasons why forms of transportation have changed significantly over last five years

Reasons why forms of transportation have changed significantly over the last five years
• Employ more use of contracted transportation services due to high road costs and wages, efficiency of larger transport vehicles due to the closure of smaller depots (n = 5)
• Change of industry (n = 2)
• Purchased own vehicle so no need for contracted transportation services (n = 2)
• Varied crop / produce each season so different requirements (n = 2)
• Requirement to transport goods in refrigerated vehicle (n = 1)
• Reduce risk of spillage of chemicals and fertiliser (n = 1)
• High costs associated with owning large vehicle (n = 1)
• Different routes five years ago (n = 1)
• Different farm management five years ago (n = 1)
• Use own vehicles more now than five years ago due to unreliable contractors (n = 1)

5.19 Other comments

When provided with an opportunity to provide other comments, several issues were raised (see Table 12). Note that the reasons are many and varied and, in general, are too small in number to be considered statistically significant. However, they provide a flavour of the types of issues that are on the minds of farmers when it comes to transportation and broader issues.

Table 12: Other comments

Theme	Specific comment
More support for farmers	• More funding / support for farmers (n = 5)
Environmental issues	• Coal seam gas on the Warrigoo Highway is a safety hazard (n = 1) • Drought issues (n = 1)
Condition of roads	• Heavy traffic has worsened the condition of roads, creating safety hazards (such as not enough slip lanes), roads unable to accommodate large vehicles (n =4)
Road connection improvements	• They could look at extending city rail to Tamworth from Sydney (n = 1)
Miscellaneous	• More equitable distribution of the fuel tax (n =1) • Restructure wages
Road access issues	• Greater access for road trains (n =1) • Volume loading for rigid trucks (n =1) • The high mass system is a bit too complicated for the seasonal system (n = 1) • The supply chain is one of the big impediments / cost to our business compared to Western Australia, they have bigger trucks and also overseas countries transportation costs are less than Australia too (n =1) • The general trend is towards getting external contractors/ refinancing equipment is getting too expensive for individual contractors/the trend is to buy bigger trucks and hire external contractors (n = 1) • More expensive to keep trucks on road (n = 1)

5.20 Respondent characteristics

Survey respondents' key characteristics include:

- age;
- gender; and
- farm size.

Age

As shown in Figure 19, 77 per cent of respondents were aged between 40 and 69 years.

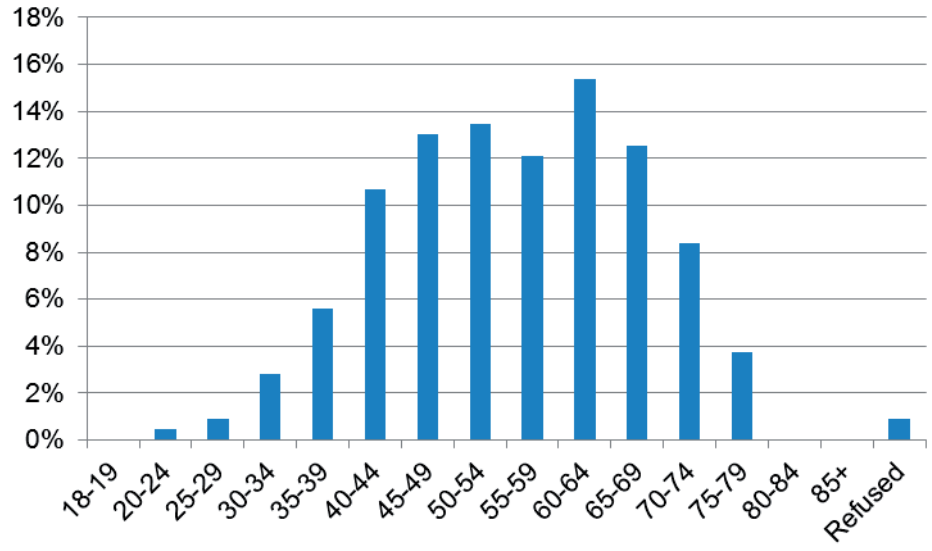


Figure 19: Age of survey respondents

Gender

As shown in Figure 20, over two thirds of respondents (67 per cent) were male.

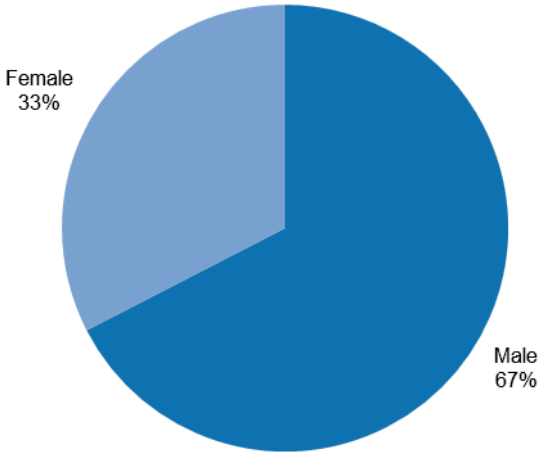


Figure 20: Gender of survey respondents

Size of farm – currently vs. five years ago

Table 13 shows that, overall, the size of farms of the survey respondents has remained fairly static over the last five years.

Table 13: Farm size - currently vs. five years ago

Farm size categories	Current Percentage	Five years ago Percentage	Difference Percentage points
Up to 100 hectares	23%	22%	+1
101 – 500 hectares	34%	35%	-1
501 – 1 000 hectares	13%	15%	-2
1001 – 2 000 hectares	18%	18%	0
Over 2 000 hectares	11%	10%	+1
Total	**100%**	**100%**	

If we examine the size of farms and their corresponding industry segments, Figure 21 illustrates that the grains and oilseeds industry appear to dominate the larger farms and the fruit and nuts and dairy industries tend to operate on smaller farms.

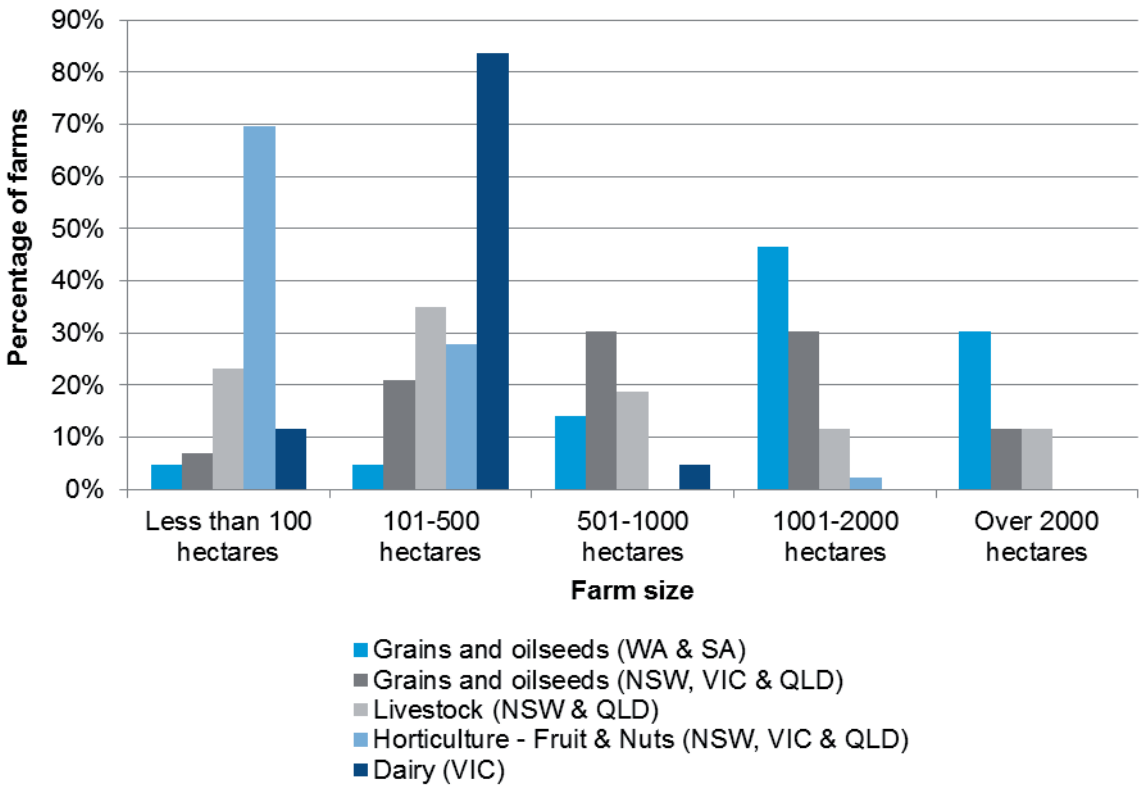


Figure 21: Current farm size by industry segment

6. Implications

Our research into vehicles used in the farm sector provides a current and empirical evidence base for stakeholders. Although the surveying we have undertaken is not a comprehensive examination of all aspects of the use of vehicles in the agricultural sector, it provides insightful information into various aspects of the current stock of farm vehicles and historical and future trends. Additionally, we have provided further insights by making comparisons to the general vehicle fleet, where we have been able to do so.

Our research and analysis provides a wide variety of insights at both an aggregate level and for the four major agricultural industries that we identified. There is a range of types of useful insights that we have been able undertake using both data from state and territory governments and our survey of farmers:

- there are a range of ways in which we can express the number of vehicles that are involved in farm businesses. For example: including both light and heavy vehicles; including just heavy vehicles; including non-registered vehicles; and including those vehicles used to transport goods to and from the farm. The appropriate definition of vehicle numbers may depend on the policy issue at hand;

- there are some similarities in the current stock of vehicles across difference industry sectors but also some distinct differences. In aggregate across the five segments surveyed, the most common types owned and operated by farmers are light commercial vehicles and heavy rigid trucks. Some of the key differences are: the dairy and livestock industries have a statistically higher proportion of farms that own and operate one or two vehicles than the two grain industry sectors. Furthermore, apart from the dairy industry (where the buyer of the milk typically collects the produce directly from the farm), the other industries surveyed mostly transport their farm produce to the next point in the supply chain either via vehicles owned by the farm business or by an external party contracted by the farm business;

- there are a range of general observations across all industries. Some key ones are: almost 50 per cent of farm vehicles travel on unsealed roads; over half of operators of articulated vehicles, B-doubles and road trains stated that they change vehicle configuration according to their freight needs[61]; and there is a small proportion of farmers that are experiencing issues with vehicle access to roads (14 per cent of the survey respondents experience vehicle access problems[62] on the road network), suggesting potential opportunities for efficiency improvements; and

- the industry trends are not so obvious. However, our survey did observe that for the grains and oilseeds industries, the greatest travel distance is attributed to transporting farm outputs to storage facilities; for the livestock industry, 67 per cent stated that the next point in the supply chain is the sale yard; for those within the fruit and nuts industry, 44 per cent of respondents surveyed stated that the next point in the supply chain for them varied, such as to a distributor, a packing shed, directly to shops, wineries, transport depot, and so on; most dairy farm businesses surveyed (65 per cent) stated that the next point in the supply chain was a processing plant. Furthermore, apart from the dairy industry, the other industries surveyed mostly transport their farm produce to the next point in the supply chain either via vehicles owned by the farm business or by an external party contracted by the farm business. Over the last five years, there has been a slight increase in

[61] Note that the study did not examine the way in which trailers or prime movers are used to change the vehicle configuration for different freight tasks.

[62] On some roads in Australia vehicle access is restricted according to the type of vehicle and by maximum mass limits.

the use of contracted transportation services and a slight decline in the use of vehicles owned by the farm.

Therefore, there are a range of characteristics of vehicles in the farm sector that are important to recognise when policies are implemented by governments that affect the transport sector, such as transport infrastructure and road pricing, and in developing industry-specific policies.

The results from the farm survey presented in this paper have been averaged across all farmers within particular industry segments. Therefore, we recognise that within a particular segment there are farmers that may be above or below the average, and this report should be read in that context.

7. Recommendations

- **Examine opportunities for improved transport efficiency in the agricultural sector**

There are a range of indicators to suggest that further research could be undertaken to determine whether there is potential to improve transport efficiency within the farm sector. For example, there is evidence from the survey that:

- there are a range of vehicle access and road infrastructure issues being experienced by farmers, restricting use and investment in higher productivity vehicles. This is evident in the survey results where 14 per cent of survey respondents described issues that they have with the road network in Australia. Research could be conducted to further ascertain the exact nature of these access issues;

- the average distance travelled by heavy farm vehicles is less than the broader heavy vehicle fleet, which may indicate that there is scope for greater utilisation of the agricultural transport fleet, such as through an increase in the proportion of contracted transportation services. Research could be conducted to investigate the reasons why farmers choose to employ the use of contracted transportation services, such as timing and availability of contract services at critical times during farm seasons. Additionally, research could be undertaken to understand how vehicle operating costs vary between farm-owned and contracted service providers, as well as similar vehicles in non-farm sectors;

- most farmers are not monitoring their fuel use. This may indicate that there are opportunities for improvements in fuel efficiency within the farm sector; and that

- farmers that use articulated vehicles are changing the nature of the vehicle configuration according to the freight task. Further surveying could be undertaken to determine exactly how trailers and prime movers are used in different vehicle configurations and the reason for the changes to configuration.

There are some limitations in our comparisons across our five industry sectors because of the sample sizes. Further sampling could provide greater clarity on the differences across sectors. Additionally, it would be useful to obtain more detailed data on the age of vehicles at the higher end of the age brackets. These issues could be examined further to investigate ways to improve transport efficiency in the supply chain process. A better understanding of these issues will allow more informed policy decisions in improving efficiency and productivity in the farm sector.

- **Conduct further research into vehicle choice and external contracted transportation services**

The survey data collected from road agencies and transport departments indicate that there is some evidence that there has been a move towards larger farm vehicles over time. However, the survey results do not provide evidence that farm businesses have been replacing their vehicles with larger vehicles (in the last five years). Given this contradiction, and the implications of larger vehicles for transport efficiency, there may be benefit in further examining vehicle choice decisions by farmers and what influences these decisions.

Additionally, since detailed information was obtained on farm vehicles owned and operated by the farm business and not on external transportation services, there may be benefit in further examining the external transportation part of the supply chain to give a more holistic view of the agricultural transport industry.

Finally, there may be a benefit in exploring innovative approaches to transport that are being undertaken by different farmers, including issues such as vehicle utilisation, vehicle maintenance, route choices, and vehicle choice.

Appendix A: State definitions of farm vehicles

Below are specific definitions of "primary producers" for each state as referred to in the report.

New South Wales

According to Transport for NSW[63], a 'primary producer vehicle' is defined as a vehicle that is owned by a primary producer or rural society and is used for:

- Transporting products and materials that have been produced by a primary producer;
- Transporting leaves that a primary producer has gathered, from which eucalyptus or other oil is to be distilled;
- Transporting goods of any kind that will be used in a primary producer's business or household; or
- Purposes connected with clearing land that a primary producer will be using for primary production.

Victoria

According to VicRoads[64], a primary producer is:

- engaged solely or substantially in agricultural, horticultural, viticultural, dairying, pastoral or other like pursuits, or
- a commercial fisherman holding a licence to take fish for sale.

All vehicles registered as a primary producer vehicle must be used solely in connection with the operator's business as a primary producer. Eligible vehicles include:

- Vehicles constructed for carrying a load, prime mover, a tractor, a vehicle with an engine used to drive or operate an agricultural implement, or a vehicle constructed for agricultural purposes or a Quad bike.
- Vehicles with body types such as station wagons, wagons, utility and panel vans, that are fitted with no more than six (6) seats and have a goods carrying capability.

Queensland

The Queensland Department of Transport and Main Roads defines a 'farming primary producer'[65] as:

---

[63] Transport for NSW 2012, *Information for Primary Producers*, viewed 10 May 2013, <http://www.rta.nsw.gov.au/heavyvehicles/downloads/info-primary-producers.pdf>.

[64] VicRoads 2012, *Registering primary producer vehicles*, viewed 10 May 2013, < http://www.vicroads.vic.gov.au/Home/Registration/WhatHasToBeRegistered/OtherVehiclesvesselsAndRegistrationIssues/RegisteringPrimaryProducerVehicles.htm>.

- A vehicle used by a primary producer and used solely in connection with the primary producer's business (i.e. agriculture, livestock grazing, dairying, grain).

Western Australia

The Western Australian Department of Transport defines 'farm haulage / primary producer'[66] vehicles as:

- vehicles weighing 1524kg or more that are owned by farmers and used to carry the products or requisites of the owner's farming business.

South Australia

According to the South Australian Department of Planning, Transport and Infrastructure, 'primary producer'[67] means a person:

- who carries on as principal, an agricultural business; or
- who under a written share-farming agreement works land as a sharefarmer and not as an employee; or
- who carries on as principal in the business of fishing.

---

[65] Department of Transport and Main Roads (QLD) 2012, *Purpose of Use Categories*, <http://www.tmr.qld.gov.au/~/media/Registration/purpose_of_use_categories.pdf>.

[66] Department of Transport (WA), *Concessions: Farming vehicles*, viewed 6 May 2013, <http://www.transport.wa.gov.au/licensing/20615.asp#23423>.

[67] Department of Planning, Transport and Infrastructure (SA), *Application for vehicle concession (Primary Producer, Outer Areas)*, viewed 10 May 2013, <http://www.sa.gov.au/upload/franchise/Transport,%20travel%20and%20motoring/Registration/MR21_application_for_concession.pdf>.

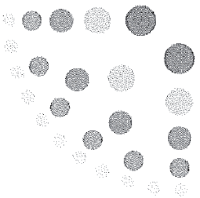
Appendix B: Organisations contacted

We contacted a number of government transport agencies and departments to seek any further information that would be relevant for the study. We did not seek to contact road / transport agencies in Tasmania, Australian Capital Territory, or the Northern Territory.

Organisations successfully engaged include:

- National Transport Commission;
- Department of Planning, Transport and Infrastructure (South Australia);
- Department of Transport and Main Roads (Queensland);
- Transport for NSW (New South Wales);
- Main Roads Western Australia (Western Australia)
- Department of Transport (Western Australia); and
- VicRoads (Victoria).

Appendix C: Letter provided to organisations



Australian Government
Rural Industries Research and Development Corporation

21 March 2012

To whom it may concern,

RE: RIRDC study analysing Road Transport Trends in Australian Agriculture

We are seeking the assistance of a number of agencies with a research project that is examining the profile of agricultural vehicles that are used by farm business, including recent trends. We have recently commissioned Marsden Jacob Associates (MJA) to undertake this study and it forms part of our broader agricultural research program. In particular, this project should provide policy makers with new information about the use of transport by farms across Australia.

A profile of the Rural Industries Research and Development Corporation (RIRDC) and the project is attached for your information. In summary, RIRDC is a statutory authority established by the Australian Government to work with industry to invest in research and development for a more profitable, sustainable and dynamic rural sector.

As part of the study, MJA is undertaking a review of information and data that could provide insights into the use of vehicles used by farms. This review includes MJA contacting road and/or transport departments/agencies to see whether they have any information that might improve our understanding of the use of farm transport and recent trends. We seek your assistance in working with MJA in this regard.

RIRDC recognises that there may be confidentiality and privacy issues around releasing information and data sets. However, we expect that we will only require information in an aggregated form and would be happy (via MJA) to work through any issues that may constrain the release of information.

There is a range of information about farm transport that MJA is looking to collect as part of the project. One of the key issues will be whether vehicles used to operate or service farm businesses can be identified in existing data sets. The types of information will broadly speaking cover the following:

1. the profile of vehicles used as part of farm businesses (including those used to move goods and services to and from a farm), including:
    a. the number of vehicles registered by each vehicle class (and for each type of farm);
    b. vehicle ownership arrangements (farm owned, leased, contracted);
    c. seasonal registrations;
2. historical trends in the profile and expected changes in the future;
3. information about the use of the vehicles, including: whether they are used for on-farm purposes or to deliver farm inputs or outputs; and their average kilometres travelled per annum; and
4. issues with road access by farmers (for example, access constraints related to a vehicle type or mass on a vehicle).

RURAL INDUSTRIES Research & Development Corporation
Level 2, 15 National Cct Barton ACT 2600 PO Box 4776 Kingston ACT 2604 www.rirdc.gov.au
ph. 02 6271 4100 fax. 02 6271 4199 e. rirdc@rirdc.gov.au ABN 25 203 754 319

Australian Government
Rural Industries Research and Development Corporation

Marsden Jacob Associates will be in touch with your organisation shortly to ascertain if there are any relevant data you may have on hand and willing to contribute to the project.

In the meantime, if you have any queries relating to this letter, please contact me on 02 6271 4127 or alternatively, you can contact Matthew Clarke or Christine Tran at Marsden Jacob Associates on 03 9882 1600.

Yours sincerely,

Dr Sam Nelson
Senior Research Manager

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Appendix D: Sampling strategy

This section outlines our initial sampling strategy for the survey of farm vehicle operators. Specifically, it explains how we arrived at estimates for the Australian farm vehicle population, the value of agricultural commodities, and how we determined appropriate sample sizes to extract statistically significant results.

Although the total number of farm vehicles was revised downwards after the receipt of information from road agencies and departments, this did not change the required sample sizes.

In addition, it is important to note that the following strategy was devised prior to the commencement of the survey, and therefore was written in that particular context.

Farm vehicle population

The 2010 Australian Bureau of Statistics (ABS) Survey of Motor Vehicle Use (SMVU) indicates that approximately 200 000 vehicles operate in non-urban areas. This includes vehicles from all industry classes, although agriculture is likely to comprise a large proportion of these vehicles. The total population of farm vehicles that is relevant for this study is likely to be a subset of these amounts. Respondents in-scope for the survey are restricted to farmers and excludes those that provide transport services for farmers. However, in the survey, we will ask farmers about their use of transport services provided to them by others.

Based on information from the ABS SMVU (200 000) and the 120 000 figure quoted in a 2007 submission by the National Farmers' Federation (NFF)[68], the population of farm trucks is estimated to be between 120 000 and 200 000. For the purposes of the survey, we will assume that the population of farm trucks is 160 000.

We believe that a broad based survey of all farmers would be unproductive and not provide statistically significant results at a reasonably low margin of error. Therefore in our proposal, we committed to surveying key segments within the agricultural sector based on agricultural commodities that have the largest values of production in Australia.

Table 14 below provides a summary of the value of agricultural commodities produced in Australia.

[68] National Farmers' Federation 2007, *2007 Heavy Vehicle Charges Determination: Draft Regulatory Impact Statement – NFF Submission*, July, NFF, Canberra.

Table 14: Value of Agricultural Commodities Produced, Australia, gross value, 2010-11

Commodity	Gross value	Percentage of total commodities produced (selected sub-categories)	Percentage of total commodities produced
	$ million	%	%
Livestock slaughtered and other disposals	13 795.3		30
Cattle and calves	*7 823.8*	*17*	
Sheep and lambs	*2 861.9*	*6*	
Grains and oilseeds	13,185.2		29
Cereals for grain	*9 844.5*	*21*	
Oilseeds	*1,327.5*	*3*	
Livestock products	7 177.1		16
Whole milk	*3 931.8*	*8*	
Wool	*2 673.1*	*6*	
Fruit	4 026.3		9
Grapes (incl. for wine)	*1 013.4*	*2*	
Pome fruit (incl. apples and pears)	*775.7*	*2*	
Vegetables for human consumption	3 338.2		7
Other crops	3 108.4		7
Cotton	*1,901.9*	*4*	
Sugar cane	*973.5*	*2*	
Nurseries, cut flowers and cultivated turf	1 262.7		3
Vegetables for seed	127		0
Total	**46 020.2**		**100**

Source: Australian Bureau of Statistics 2010-11, Cat. no. 7503.0

Notes:

1. Gross value refers to "the value placed on recorded production at the wholesale prices realised in the market place".

It can be seen in Table 14 above that the four most significant commodities produced in terms of value are:

- Livestock slaughtered and other disposals;
- Grains and oilseeds;
- Livestock products; and
- Fruit.

Based on this information, we believe that these categories need to be further segmented by region to avoid highly averaged results. Table 15 provides a breakdown by states and territories to derive an

appropriate mix of segments based on the top four industries. We propose the sample be comprised of five segments as follows:

1. Grains and oilseeds (WA & SA);
2. Grains and oilseeds (VIC, NSW & QLD);
3. Livestock (QLD & NSW);
4. Fruit – including nuts (VIC, NSW & QLD); and
5. Dairy – Whole milk (VIC).

Table 15: Value of Agricultural Commodities Produced, breakdown by states and territories, gross value, 2010-11

Commodity	State								
	NSW $m	VIC $m	QLD $m	SA $m	WA $m	TAS $m	NT $m	ACT $m	Australia $m
Grains and oilseeds	4 468.0	2 448.6	923.5	2 847.0	2 425.5	57.1	15.1	0.4	13 185.2
Grains and oilseeds (WA & SA)	5 272.5 (40% of total)								
Grains and oilseeds (VIC, NSW & QLD)	7 840.1 (59% of total)								
Livestock	3 084.2	3 198.1	4 129.0	1 391.1	1 410.2	251.0	327.3	4.5	13 795.3
Livestock (QLD & NSW)	7 213.2 (52% of total)								
Fruit – including nuts	704.3	1 548.9	898.3	712.9	288.6	108.3	45.6	0.1	4 307.8
Fruit – including nuts (VIC, NSW & QLD)	3 151.5 (73% of total)								
Dairy – Whole milk	504.7	2 483.4	257.5	217.7	157.0	311.6	0.0	0.0	3 931.8
Dairy – Whole milk (VIC)	2 483.4 (63% of total)								

Source: Australian Bureau of Statistics 2010-11, Cat. no. 7503.0

Notes:

1. Gross value refers to "the value placed on recorded production at the wholesale prices realised in the market place".

Grains and oilseeds have been split up into two groups, as Western Australia and South Australia share similar trends in relation to the proximity of grains and oilseeds farms to ports, which affect supply chain characteristics. States on the east coast (Victoria, New South Wales and Queensland) also share similarities in that most of the grains and oilseeds farms are located greater distances to ports than Western Australia and South Australia and there is significant domestic feed and flow market on the east coast of Australia.

ABARES statistics and ABS statistics indicate that Queensland and New South Wales are the largest

producers/suppliers of livestock. Similarly, the east coast of Australia is a large producer of fruit and Victoria produces the majority of dairy within Australia.

Furthermore, segmenting the categories into groups with similar supply chain characteristics enables statistically significant results at a reasonably low margin of error. Table 16 displays the five proposed sampling segments and their estimated margins of error based on equal sample sizes of 43 (20 per cent) in each category. A total sample size of 215 (including 5 pilot surveys) was chosen because it provides a reasonable level of statistical significance (15 per cent margin of error at a 95 per cent confidence level) and is within the project budget.

Table 16: Sampling statistical significance

Commodity	Region	Farm vehicle population estimate	Estimated margin of error	Sample size
Grains and oilseeds	WA & SA	18 331	15%	43
Grains and oilseeds	VIC, NSW & QLD	27 258	15%	43
Livestock	QLD & NSW	25 078	15%	43
Fruit (including nuts)	VIC, NSW & QLD	10 957	15%	43
Dairy (Whole milk)	VIC	8 634	15%	43
Total		**90 258**	**7%**	**215**

Source: Based on Australian Bureau of Statistics 2010-11, Cat. no. 7503.0

Notes:

1. The farm vehicle population of each segment was calculated based on a total number of farm vehicles of 160,000 and applying corresponding proportions of value of agricultural commodities produced across each of the segments.

2. The estimated margin of error is based on a 95% confidence level.

Targeting survey samples

The market research firm that will be conducting the telephone interviews (McNair Ingenuity Research) maintain a database of farmer contacts, including name, address and phone numbers which will be utilised for this survey. McNair's database is categorised by state, farm type, and the following industries:

- crops and grains; and
- livestock and sheep.

The categories above can be segmented via geographical area in order to narrow down targeted groups such as fruit and dairy.

Appendix E: Survey

Farm Vehicles Survey 1322X

Hello, my name is _____, and I am calling on behalf of the Rural Industries Research and Development Corporation (RIRDC) from McNair Ingenuity Research. The RIRDC is a statutory authority established by the Australian Government to invest in the rural sector.

We are conducting important research regarding vehicle usage on farms, and we would appreciate you taking the time to answer some questions. I need to speak to a farm manager that can tell me about your vehicle usage, and it would be best if that person can also talk about vehicle usage at the farm five years ago as well. Would you be able to assist – or who should I speak to? **IF NOT AVAILABLE CONTINUE WITH CURRENT RESPONDENT**

ARRANGE CALLBACK AS NECESSARY NAME:

_____

[REPEAT INTRODUCTION IF NEW PERSON COMES TO THE PHONE]

Who am I speaking with? **RECORD FIRST NAME** Is it ok if I call you **FIRSTNAME?**
SAY IF NECESSARY: Your replies will, of course, be treated in complete confidence, and all comments will be added together in an unidentified way to form an overall picture that will inform transport policy.

SAY IF NECESSARY: This is solely for research purposes and we will not try to sell you anything afterwards.
The survey should take about 15 minutes of your time.

Is now a good time to speak to you or would it be more convenient if I made an appointment to speak to you at a later time?

S1 And can I check, you are 18 or over? 1 Yes 2 No **ASK FOR ADULT**

S2 Can I check you are in… **PIPE FROM SAMPLE AMEND AS NECESSARY**

Northern NSW (north of Sydney, such as Cowra, Blayney, Forbes)	1	CONTINUE
Southern NSW (south of Sydney, such as Grenfell, West Wyalong, Griffith, Young)	2	CONTINUE
Victoria	3	CONTINUE
Queensland	4	CONTINUE
South Australia	5	CONTINUE
Western Australia	6	CONTINUE
Tasmania	7	**TERMINATE**
Northern Territory	8	**TERMINATE**
Australian Capital Territory	9	**TERMINATE**

1.a Firstly, Which one of the following comprises the main produce or output of your farm?
SINGLE RESPONSE ONLY READ LIST

1.b And thinking about five years ago, in 2008, which one of these was the main produce of your farm?

	1.a. Current **SR**	**1.b** 5 years ago (2008) **SR**	
Grains and/or oilseeds	1	1	**CHECK QUOTAS**
Dairy	2	2	
Livestock	3	3	
Fruit and or nuts	4	4	
Other (please specify _____)	5	5	**TERMINATE**

2.a What is the approximate size of your farm?

a. Currently: _____ hectares

2.b. And five years ago, was that the same, or different? How big was the farm then?

b. Five years ago: _____ hectares **RECONFIRM FARM SIZE**

3. How many trucks and farm vehicles does your farm have - including all commercial vehicles that you use to move farm produce on and off the farm. So not counting agricultural machinery or tractors?

0 1 2 3 4 5 6 7 8 9+

↓

Not applicable / do not currently own or lease any farm vehicles **GO TO Q18**

4.a. Which of these categories would your truck(s) be in?

ASK BROAD CATEGORIES FIRST: Light truck, large rigid, articulated or B-double?

And would it/they be… **READ OPTIONS FOR THAT CATEGORY.**

THEN ASK HOW MANY IN EACH CATEGORY, CHECK TOTAL EQUALS TOTAL OF Q3

	Numeric single digit entry below	**Select 1 from each of the 4 categories below** up to a max of 3 for qs 5-14
Light commercial vehicle <4.5 tonnes		
Light rigid truck <4.5 tonnes		
Rigid truck (two axle) >4.5 tonnes		
Rigid truck (three axle) >4.5 tonnes		
Rigid truck (four axle) >4.5 tonnes		
Rigid truck (two axle) plus two axle trailer >4.5 tonnes		

Rigid truck (three axle) plus two axle trailer >4.5 tonnes		
Rigid truck (three axle) plus three axle trailer >4.5 tonnes		
Rigid truck (four axle) plus four axle trailer >4.5 tonnes		
Articulated - prime mover (two axle) plus two axle trailer		
Articulated - prime mover (three axle) plus two axle trailer		
Articulated - prime mover (three axle) plus three axle trailer		
Articulated - prime mover (three axle) plus four axle trailer		
B-double (eight axle or less)		
B-double (nine axle)		
B-triple		
Double road train		
Triple road train		
Other (Please specify _____)		
SHOW TOTAL MUST ADD UP TO SAME REPONSE AS Q3		

ASK FOR EACH OF SELECTED VEHICLES LOOP QUESTIONS 5-14

5.a And is that vehicle owned or leased?

Owned 1
Leased 2

6.a Approximately how many kilometres per annum does that vehicle travel?

Less than 5,000 km per annum	1
5,000 – 9,999 km per annum	2
10,000-19,999 km per annum	3
20,000-29,999 km per annum	4
30,000-49,999 km per annum	5
50,000-99,999 km per annum	6
100,000-149,000 km per annum	7
150,000km+ per annum	8
Don't know **DO NOT READ OUT**	**9**

7.a. What was the average fuel consumption of this vehicle over the last year?

Numeric	2 digits [_ _] Litres per 100 kms	
	Don't know **DO NOT READ OUT**	2

8.a. And what proportion of that vehicle's usage is on farm and off farm? Would you say…

None on farm	1	**CHECK** So this vehicle is used __% on farm and __% on the road, would that be correct?
Up to 10% on farm	2	
10%-25% on farm	3	
26% to 49% on farm	4	
50% (half) on farm	5	
51% to 75% on farm	6	
76%-90% on farm	7	
Over 90% on farm	8	
100% (all) on farm	9	
Don't know **DO NOT READ OUT**	10	

9.a. And is this vehicle registered all year round, or is it a seasonal-only registration?

Registered all year round	1
Seasonal only registration	2
Not registered	3

10.a And how old is this vehicle? Would it be… **READ LIST AS NECESSARY**

Less than 1 year	1	**GO TO Q 12a**
1 year to less than 2 years	2	**GO TO Q 12a**
2 years to less than 3 years	3	**GO TO Q 12a**
3 years to less than 5 years	4	**GO TO Q 12a**
5 years to less than 8 years	5	**CONTINUE**
8 years or more	6	**CONTINUE**

11a. And what about five years ago, was this vehicle owned or leased then?

Owned	1
Leased	2

12a. When do you expect to the replace this vehicle?

In less than 1 year	1	**CONTINUE**
1 year to less than 2 years	2	**CONTINUE**
2 years to less than 3 years	3	**CONTINUE**
3 years to less than 5 years	4	**GO TO Q 14**
5 years to less than 8 years	5	**GO TO Q 14**
8 years or more	6	**GO TO Q 14**

13a. And when you replace this vehicle, will that be with the same type of vehicle, or another?
IF ANOTHER PROBE FOR TYPE

Same PIPE TO SHOW TYPE	**20**
Light commercial vehicle <4.5 tonnes	01
Light rigid truck <4.5 tonnes	02
Rigid truck (two axle) >4.5 tonnes	03
Rigid truck (three axle) >4.5 tonnes	04
Rigid truck (four axle) >4.5 tonnes	05
Rigid truck (two axle) plus two axle trailer >4.5 tonnes	06
Rigid truck (three axle) plus two axle trailer >4.5 tonnes	07
Rigid truck (three axle) plus three axle trailer >4.5 tonnes	08
Rigid truck (four axle) plus four axle trailer >4.5 tonnes	09
Articulated - prime mover (two axle) plus two axle trailer	10
Articulated - prime mover (three axle) plus two axle trailer	11
Articulated - prime mover (three axle) plus three axle trailer	12
Articulated - prime mover (three axle) plus four axle trailer	13
B-double (eight axle or less)	14
B-double (nine axle)	15
B-triple	16
Double road train	17
Triple road train	18
Other (Please specify _____)	19

IF CODES 10-18 in 4, (ARTICULATED, B-DOUBLE OR ROAD TRAIN) ASK:

14a Thinking about the **PIPE VEHICLE FROM Q4** , do you typically use this vehicle in one tied configuration, or different configurations depending on the freight task?

Typically use one tied configuration	1
Change configurations depending upon the freight task	2
Not applicable **DO NOT READ OUT**	3

END OF LOOP FOR EACH VEHICLE

15. On average, what proportion of your vehicles' travel kilometres is on sealed roads versus unsealed roads?

None unsealed	01	**CHECK** So your truck(s) drive(s) __% on unsealed roads and __% on sealed roads, would that be correct?
Up to 10% unsealed	02	
10%-25% unsealed	03	
26% to 49% unsealed	04	
50% (half) unsealed	05	
51% to 75% unsealed	06	
76%-90% unsealed	07	
Over 90% unsealed	08	
100% (all) unsealed	09	
Don't know **DO NOT READ OUT**	10	

16. What type(s) of mass concessional schemes and/or permits do you participate in or use for your vehicles (select all that apply)?

High Mass Limit (HML)	1
Concessional Mass Limit (CML)	2
Permit	3
Other (please specify _____)	4
None	5

17. Do you have issues with vehicle access along your transport routes that constrain your business (such as mass and vehicle type issues)?

Yes – please provide some further detail: **PROBE FOR CLARITY AND DETAIL**	1
_____	
No	2
Don't know **DO NOT READ OUT**	3

18. What is the **next point** in the supply chain **by road** for **most** of your **farm outputs** ? **READ LIST AS NECESSARY**

SINGLE RESPONSE **SHOW A,B,C OR D LIST FROM CODES 1,2,3 or 4 FROM Q1A**	**(a) Grains & oilseeds** SR	**(b) Dairy** SR	**(c) Livestock** SR	**(d) Fruit / nuts** SR
Flour Mill	01	X	X	X
Feed Mill	02	X	X	X
Processing plant Eg abattoir for livestock	X	03	03	03
Storage facility	04	X	X	04
Port Terminal (not via an up country storage facility/ silo)	05	X	X	X
Port terminal for live export	X	X	06	X
Sale yard	X	X	07	X
Market	X	X	X	08
Produce picked up on farm for unknown destination	09	09	09	09
Other Please Specify _____	10	10	10	10

19. What is the **distance** to the next point in the supply chain (as specified above) from the farm?

_ _ _ , _ _ _ kilometres

Don't know **DO NOT READ OUT** 2

20.a What percentage of farm produce is transported from the farm to the **next point in the supply chain** (as specified above)… **READ FOR EACH**?

20.b And what percentage of farm produce was transported from the farm to the **next point in the supply chain** (as specified above) five years ago – that is 2008 **READ FOR EACH**?

Percentage of travel (%)	20a Currently	20b Five years ago 2008
By vehicles owned by the farm	_ _ %	_ _ %
By vehicles leased to the farm	_ _ %	_ _ %
By external party contracted by farmer	_ _ %	_ _ %
By buyer of outputs	_ _ %	_ _ %
Other: Please specify _____	_ _ %	_ _ %
OR ↓ Total CHECK	**100%**	**100%**
No Different **DO NOT READ OUT**	X	2
Not applicable	3	3
Don't know **DO NOT READ OUT**	4	4

21.a. Now thinking about **major farm inputs** such as fertiliser, chemicals, seed, fodder, fuel, livestock, but excluding machinery, that require transportation to the farm, what percentage is transported to your farm **READ FOR EACH**?

21.b. And thinking back five years ago (2008), what percentage of farm inputs was transported **READ FOR EACH**?

Percentage of travel (%)	21a Currently	21b Five years ago 2008
By vehicles owned by the farm	_ _ %	_ _ %
By vehicles leased to the farm	_ _ %	_ _ %
By external party contracted by farmer	_ _ %	_ _ %
By seller of inputs	_ _ %	_ _ %
Other: Please specify _____	_ _ %	_ _ %
OR ↓ Total CHECK	**100%**	**100%**
No Different **DO NOT READ OUT**	X	2
Not necessary since sourced on-farm	3	3
Not applicable	4	4
Don't know **DO NOT READ OUT**	5	5

22. If the forms of transportation for your agricultural commodities have changed significantly over the past five years, please specify why:

23. A just a last couple of questions for statistical purposes… Which age group do you belong to**?**
READ LIST AS NECESSARY

18 – 19	1	35 – 39	5	55 – 59	9	75 – 79	13
20 – 24	2	40 – 44	6	60 – 64	10	80 – 84	14
25 – 29	3	45 – 49	7	65 – 69	11	85 +	15
30 – 34	4	50 – 54	8	70 – 74	12	Refused **DO NOT READ OUT**	16

24. RECORD GENDER AUTOMATICALLY Male 1 Female 2

25. Do you have any other comments?

Thank you for your time. Again, I am **[your first name]** from McNair Ingenuity Research on behalf of the Rural Industries Research and Development Corporation (RIRDC). We assure you that your answers are used only for statistical purposes and will not be identified back to you.

If you have any queries you can call us on 1800 669 133. Thank you and goodnight.

Appendix F: Detailed data

Data collection from state road agencies / departments

New South Wales: Number of primary producer vehicles registered

Table A 1: Number of primary producer vehicles registered in New South Wales

Type of vehicle	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Light vehicles	46 117	43 578	41 679	40 621	39 394	38 114	36 972	35 594	34 495	33 682	33 036	32 439	31 989
Rigid truck (no trailers)	18 240	17 664	16 812	16 875	16 283	15 858	15 074	14 712	14 631	14 325	14 317	13 968	13 591
Short combination prime mover - one trailer	2 198	2 295	1 880	2 337	2 297	2 356	1 883	1 832	2 307	2 267	2 632	2 647	2 616
Short combination truck & trailer 6 axle limit	749	761	666	802	807	833	668	678	828	865	970	1 003	1 038
Medium combination truck & trailer over 6 axles	35	52	49	64	75	96	105	126	135	156	200	225	244
Medium and long combination prime mover	158	198	196	284	322	368	372	397	535	599	714	794	879
Long combination truck - 2 or more trailers	3	2	3	1	2	2	3	3	3	4	5	1	1
Total	**67 500**	**64 550**	**61 285**	**60 984**	**59 180**	**57 627**	**55 077**	**53 342**	**52 934**	**51 898**	**51 874**	**51 077**	**50 358**

Source: Transport for NSW

Queensland: Number of primary producer vehicles registered

Table A 2: Number of primary producer vehicles registered in Queensland

Type of vehicle	2009	2010	2011	2012
Light vehicles	20 685	20 171	19 690	19 194
Rigid / combination vehicles	16 041	16 080	15 910	15 818
Articulated vehicles	2 271	2 312	2 440	2 492
Total	**38 997**	**38 563**	**38 040**	**37 504**

Source: Queensland Department of Transport and Main Roads

Survey data

Number of farm vehicles owned and operated

Table A 3: Number of farm vehicles owned and operated by industry segment

Number of vehicles	Grains and oilseeds (WA & SA)		Grains and oilseeds (NSW, VIC & QLD)		Livestock (NSW & QLD)		Horticulture - Fruit & Nuts (NSW, VIC & QLD)		Dairy (VIC)		Overall	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
1	3	7%	8	19%	21	49%	11	26%	18	42%	61	28%
2	6	14%	8	19%	11	26%	10	23%	15	35%	50	23%
3	11	26%	9	21%	6	14%	7	16%	6	14%	39	18%
4	6	14%	10	23%	1	2%	4	9%	2	5%	23	11%
5	9	21%	2	5%	2	5%	3	7%	1	2%	17	8%
6	1	2%	3	7%	1	2%	3	7%	0	0%	8	4%
7	0	0%	1	2%	0	0%	1	2%	0	0%	2	1%
8	3	7%	1	2%	0	0%	1	2%	0	0%	5	2%
9+	3	7%	1	2%	0	0%	2	5%	0	0%	6	3%
N/A	1	2%	0	0%	1	2%	1	2%	1	2%	4	2%
Total	**43**	**100%**	**43**	**100%**	**43**	**100%**	**43**	**100%**	**43**	**100%**	**215**	**100%**

Notes:

1. Figures may not equate exactly due to rounding.

Types of farm vehicles owned and operated

Table A 4: Types of farm vehicles owned and operated by industry segment

Type of vehicle	Grains and oilseeds (WA & SA)		Grains and oilseeds (NSW, VIC & QLD)		Livestock (NSW & QLD)		Horticulture - Fruit & Nuts (NSW, VIC & QLD)		Dairy (VIC)		Overall	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Light commercial vehicles	32	35%	25	29%	29	55%	36	51%	41	68%	163	45%
Light rigid trucks	8	9%	7	8%	9	17%	7	10%	6	10%	37	10%
Heavy rigid trucks	27	29%	35	40%	12	23%	20	29%	11	18%	105	29%
Rigid trucks with trailer/s	8	9%	4	5%	0	0%	3	4%	1	2%	16	4%
Articulated trucks	8	9%	11	13%	1	2%	2	3%	0	0%	22	6%
B-doubles	5	5%	2	2%	0	0%	1	1%	0	0%	8	2%
B-triples	1	1%	0	0%	0	0%	0	0%	0	0%	1	0%
Double and triple road trains	2	2%	0	0%	0	0%	0	0%	0	0%	2	1%
Other	1	1%	3	3%	2	4%	1	1%	1	2%	8	2%
Total	**92**	**100%**	**87**	**100%**	**53**	**100%**	**70**	**100%**	**60**	**100%**	**362**	**100%**

Notes:

1. Figures may not equate exactly due to rounding.

Farm vehicles owned or leased

Table A 5: Farm vehicles owned or leased, currently vs. five years ago

Owned / Leased	Five years ago		Currently	
	Number	Percentage	Number	Percentage
Owned	214	95%	296	97%
Leased	12	5%	10	3%
Total	**226**	**100%**	**306**	**100%**

Notes:

1. Figures may not equate exactly due to rounding.

Distance travelled per vehicle by industry segment

Table A 6: Average kilometres travelled per vehicle by industry segment

Industry segment	Heavy vehicles (<4.5 tonnes GVM)	Both light and heavy vehicles
Grains and oilseeds (WA & SA)	16 395 km	19 481 km
Grains and oilseeds (NSW, VIC & QLD)	8 171 km	12 537 km
Livestock (NSW & QLD)	14 375 km	15 109 km
Horticulture - Fruit & Nuts (NSW, VIC & QLD)	18 947 km	17 963 km
Dairy (VIC)	10 227 km	14 853 km
Total	**13 373 km**	**16 132 km**

Notes:

1. Figures may not equate exactly due to rounding.

Vehicle usage on-farm

Table A 7: Weighted average proportion of travel on-farm vehicle usage by industry segment

Industry segment	Percentage
Grains and oilseeds (WA & SA)	53%
Grains and oilseeds (NSW, VIC & QLD)	60%
Livestock (NSW & QLD)	52%
Horticulture - Fruit & Nuts (NSW, VIC & QLD)	41%
Dairy (VIC)	53%
Total	52%

Notes:

1. Figures may not equate exactly due to rounding.

Registration

Table A 8: Type of farm vehicle registration by industry segment

Type of registration	Grains and oilseeds (WA & SA)	Grains and oilseeds (NSW, VIC & QLD)	Livestock (NSW & QLD)	Horticulture - Fruit & Nuts (NSW, VIC & QLD)	Dairy (VIC)	Total
	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
Registered all year round	87%	77%	94%	91%	96%	88%
Seasonal only registration	10%	9%	2%	5%	0%	6%
Not registered	3%	14%	4%	3%	4%	6%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Notes:

1. Figures may not equate exactly due to rounding.

Age of vehicle

Table A 9: Age of vehicle by industry segment

Age of vehicle	Grains and oilseeds (WA & SA)	Grains and oilseeds (NSW, VIC & QLD)	Livestock (NSW & QLD)	Horticulture - Fruit & Nuts (NSW, VIC & QLD)	Dairy (VIC)	Total
	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
Less than 1 year	0%	1%	0%	0%	0%	0%
1 year to less than 2 years	3%	0%	4%	7%	8%	4%
2 years to less than 3 years	5%	3%	0%	5%	0%	3%
3 years to less than 5 years	14%	3%	4%	9%	15%	9%
5 years to less than 8 years	17%	14%	17%	9%	17%	15%
8 years or more	61%	79%	75%	71%	60%	69%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Notes:

1. Figures may not equate exactly due to rounding.

Planning to replace a vehicle

Table A 10: When plan to replace vehicle by industry segment

Age of vehicle	Grains and oilseeds (WA & SA)	Grains and oilseeds (NSW, VIC & QLD)	Livestock (NSW & QLD)	Horticulture - Fruit & Nuts (NSW, VIC & QLD)	Dairy (VIC)	Total
	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
In less than 1 year	0%	7%	8%	2%	6%	4%
1 year to less than 2 years	5%	10%	10%	5%	13%	8%
2 years to less than 3 years	12%	9%	13%	14%	15%	12%
3 years to less than 5 years	23%	17%	6%	19%	21%	18%
5 years to less than 8 years	19%	7%	17%	17%	19%	16%
8 years or more	40%	50%	46%	43%	26%	42%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Notes:

1. Figures may not equate exactly due to rounding.

Travel on unsealed roads

Table A 11: Proportion of travel on unsealed roads by industry segment

Industry segment	Percentage
Grains and oilseeds (WA & SA)	47%
Grains and oilseeds (NSW, VIC & QLD)	45%
Livestock (NSW & QLD)	36%
Horticulture - Fruit & Nuts (NSW, VIC & QLD)	25%
Dairy (VIC)	38%
Total	**38%**

Notes:

1. Figures may not equate exactly due to rounding.

Mass concessional schemes / permits

Table A 12: Participation in mass concessional schemes / permits by industry segment

Type of mass concessional scheme / permit	Grains and oilseeds (WA & SA)	Grains and oilseeds (NSW, VIC & QLD)	Livestock (NSW & QLD)	Horticulture - Fruit & Nuts (NSW, VIC & QLD)	Dairy (VIC)	Total
	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
High Mass Limit (HML)	14%	2%	2%	2%	0%	4%
Concessional Mass Limit (CML)	7%	7%	5%	2%	0%	4%
Permit	14%	7%	2%	2%	0%	5%
Other	9%	7%	5%	17%	2%	8%
None	41%	63%	74%	64%	79%	64%
Don't know	16%	14%	12%	12%	19%	15%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Notes:

1. Figures may not equate exactly due to rounding.

Respondent age

Table A 13: Age of survey respondents

Age group	Number	Percentage
18-19	0	0%
20-24	1	0%
25-29	2	1%
30-34	6	3%
35-39	12	6%
40-44	23	11%
45-49	28	13%
50-54	29	13%
55-59	26	12%
60-64	33	15%
65-69	27	13%
70-74	18	8%
75-79	8	4%
80-84	0	0%
85+	0	0%
Refused	2	1%
Total	**6**	**3%**

Notes:

1. Figures may not equate exactly due to rounding.

Size of farm

Table A 14: Average farm size by industry segment

Farm size	Grains and oilseeds (WA & SA)	Grains and oilseeds (NSW, VIC & QLD)	Livestock (NSW & QLD)	Horticulture - Fruit & Nuts (NSW, VIC & QLD)	Dairy (VIC)	Total
	Percentage	Percentage	Percentage	Percentage	Percentage	Percentage
Less than 100 hectares	5%	7%	23%	70%	12%	5%
101-500 hectares	5%	21%	35%	28%	84%	5%
501-1000 hectares	14%	30%	19%	0%	5%	14%
1001-2000 hectares	47%	30%	12%	2%	0%	47%
Over 2000 hectares	30%	12%	12%	0%	0%	30%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Notes:

1. Figures may not equate exactly due to rounding.

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Road transport trends in Australian agriculture

By Marsden Jacob Associates

Pub. No. 13/093

Farm transport is an important component in the consideration of policy issues such as transport infrastructure pricing and provision, transport regulations, and taxation policy. This research provides a range of insights into the profile of farm vehicles in Australia, including the total number of vehicles, vehicle types and other features of farm vehicles.

The report is intended to provide a range of stakeholders with an understanding of the profile of farm transport. These stakeholders include policy makers and researchers in government (for example, transport departments and road agencies), the transport sector, the agricultural sector, and research institutions.

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