

## FREIGHT MOVEMENTS, AUSTRALIA

### Introduction

The Australian Bureau of Statistics (ABS) is currently undertaking a major survey aimed at producing a comprehensive range of information about freight movements within Australia by road, rail, air and sea. The impetus for this came from strong representations by users of freight movement data for the ABS to collect comprehensive data in this field of statistics.

This paper discusses in some detail the work undertaken by the ABS on these surveys and provides the reader with an understanding of the major issues and problems associated with attempts to collect reliable information about freight movements in Australia, particularly road freight.

The paper gives a description of the statistics to be compiled from the surveys, a summary of which is expected to be published in the new release *Freight Movements, Australia* (9217.0). It also discusses proposed future work by the ABS on this issue, as well as the need to seek user funding to conduct future surveys.

### Freight movement data currently produced by the ABS

From September quarter 1982 until June quarter 1994, the ABS conducted a quarterly interstate road freight movement collection of all enterprises which undertook more than 20,000 tonnes of interstate road freight movements annually, either under prime contract for hire and reward or on their own account. The collection produced information on total tonnages of freight moved interstate for which road transport was used as the main mode. However, the collection has been found to provide poor measures of even this limited set of statistics and is being replaced by the new freight movements survey described later in this paper.

The ABS has also produced annual estimates of interstate freight movements by road, rail, air and sea. The rail estimates are based on information supplied to the ABS by the National Rail Corporation, while information on air and sea movements is based on data obtained by the Commonwealth Department of Transport. Only information on total tonnages moved interstate is available.

The ABS also conducts a Survey of Motor Vehicle Use, which provides broad commodity estimates of tonne-kilometres and tonnes carried by commercial vehicles in Australia. The methodology used for this survey is now under reconsideration with a view to improving the quality of results obtained.

### Deficiencies in current ABS data collection arrangements

In the discontinued quarterly interstate road freight movement collection the ABS only collected origin/destination information. It is estimated that interstate movements account for a very small proportion (around 4 per cent) of total freight movements throughout Australia. Users expressed strong concerns to the ABS about the lack of information about the rest of the freight movements. Further, only total tonnages of freight moved have been collected, with no attempt to obtain information

on the type of goods moved. This was seen by many users as a limitation to the usefulness of the data.

Although the Survey of Motor Vehicle Use collected some broad commodity data, the methodology employed only allowed for the production of data at a broad geographical level (e.g. total urban, total non-urban). In particular, it did not enable the ABS to derive origin/destination information.

### **The ABS feasibility study into freight movements**

Over the period from late 1991 to June 1992, the ABS undertook a study to determine the feasibility of collecting an expanded range of information about freight movements within Australia.

Over 80 users, covering Commonwealth and State Government departments and instrumentalities, industry associations within the transport sector, academic institutions, research organisations and private businesses were approached during the study. Strong interest in freight statistics was expressed by the Bureau of Transport and Communications Economics and the Department of Transport and Communications at the Commonwealth level, all State transport departments, rail and port authorities, State development departments, transport associations and major transport companies.

The important needs identified in the study were in relation to both interstate and intra-state freight movements, 'across statistical division' and 'short haul' movements, origin/destination details, tonnages moved (rather than value of goods moved) and commodity information. There was also strong demand for corridor information.

A sample of businesses engaged in the movement of freight was also interviewed during the feasibility study, with the objective of assessing how easy or how difficult the task of collecting reliable information about freight movements was likely to be, in the event that the ABS decided to undertake a collection on this topic. Both transport 'hire and reward' operators and other businesses (e.g. manufacturers, retailers, wholesalers, farmers, miners, etc.) who moved freight, were approached.

The ability of businesses to readily supply details of their freight movements was found to vary widely. It became apparent early that most businesses did not maintain corridor information in their systems and so this item was excluded from the study. Further, it was recognised that obtaining 'short haul' information would be a very costly and difficult exercise. Consequently, the study was restricted to longer haul movements; specifically, all road freight movements entirely within city or town boundaries and all movements of less than 25 kilometres in rural areas, were excluded.

For rail, air and sea movements, it was found that relevant public authorities and private operators are usually able to supply the required information, as they generally keep very good computerised records of their freight movements. However, there may be confidentiality restrictions limiting the release of some detailed statistics where one or two organisations are the only or the predominant operators in relation to the movement of certain commodities.

For road movements, the task would be less straightforward. Some businesses involved in road freight were found to have excellent computerised recording systems from which the required data would be readily accessible. However, others have only manual records and it became evident that developing an appropriate collection methodology for accessing the data from these businesses would be a significant challenge for the ABS.

### Collection methodology for the Freight Movement Survey (FMS)

Collection methodologies for the various modes of transport were developed and trialled in a series of pilot studies during 1992 and 1993, with a view to conducting a fully developed survey on a quarterly basis from the June quarter 1994.

For rail, air and sea movements, excluding freight carried solely within urban areas, all public authority and private business operators would be approached to complete questionnaires (or to supply appropriate computer records) for each quarter. Recognising that there may be some confidentiality restrictions where one or two organisations predominate in certain categories, an 'Instrument of Consent' would be attached to each questionnaire wherein the ABS sought the consent of organisations to allow publication of their data without specifically identifying them in published results.

For road freight movements, the methodology decided on involved:

- selecting from motor registry authorities' registers a sample of businesses and other organisations which own commercial rigid and articulated trucks and articulated trailers — both transport 'hire and reward' operators and other businesses (e.g. manufacturers, retailers, etc.) who moved freight would be included;
- conducting firstly a survey of record keeping practices of the selected organisations using a mail questionnaire approach;
- conducting the data collection phase using a number of different questionnaires tailored to the standard of record keeping practices of the individual organisations;
- as a minimum requirement, asking respondents to provide details of freight movements over a specified 2-week period in the quarter;
- asking respondents to 'record' rather than 'recall' the data and
- excluding all freight moved solely within city or town boundaries or freight moved less than 25 kilometres in rural areas.

To prevent individual movements being reported more than once, which could arise in sub-contract arrangements, respondents in the survey are requested to report only that freight moved where the organisation holds the prime contract to move the goods or where it moves the freight on its own account.

#### *Some explanation of the sampling methodology used for road freight movements.*

The ABS decided to use the commercial vehicle component of the motor vehicle register files from the various State and Territory motor registry authorities as the framework for selection of organisations to be approached. This framework was chosen because it provided the best available facility for identifying not only organisations involved in the transport 'hire and reward' industry, but also the 'ancillary' businesses (manufacturers, retailers, etc. and government agencies) involved in the movement of freight.

Under the sampling methodology developed, a snapshot is taken of all motor vehicle registrations. Owners of commercial rigid and articulated trucks, with gross vehicle/combination mass of 3.5 tonnes or more and articulated trailers, are identified to produce a frame of potential respondents (units). The frame is then sorted into four strata using the number of trucks/trailers registered in an identical name. The number of trucks/trailers is used as a proxy measure for the amount of freight carried, with greater emphasis placed on those units with more trucks/trailers. Units are sorted into the strata of 1-2 trucks/trailers (stratum 1), 3-9 trucks/trailers (stratum 2),

10-19 trucks/trailers (stratum 3) and 20 or more trucks/trailers (stratum 4). A simple random sample is selected for surveying from strata 1 to 3, while all units in stratum 4 are approached.

Approximately 340,000 organisations have been identified from the motor vehicle framework as owning one or more commercial vehicles. Of these, 6,600 were initially selected for the June quarter 1994 survey and, after eliminating out of scope units (mainly sub-contractors and 'short haul' operators), 4,400 units were finally included in the data collection phase of the survey.

Sampling techniques are also used in the data collection phase. That is, respondents are only required to provide details of freight movements over a specified 2-week period in the quarter. Where operators have a very large number of movements in the 2-week period and cannot supply aggregate data, they are asked to record a sample of their movements, based on the total number of movements undertaken. Note that in practice, a number of operators have advised that their recording systems are such that aggregate data for the whole quarter are readily accessible and have reported accordingly.

#### **Information obtained by the FMS**

For all road, rail, air and sea freight movements covered by the survey, respondents are asked to supply information on volumes of goods moved (in tonnes, litres, etc., but preferably in tonnes) and to specify the origin and destination of the movement (at a city, town or shire level). They are also supplied with a list of 32 broad commodities based on the *Australian Transport Freight Commodity Classification* (e.g. chemicals, coal, fertilizers, live animals, iron and steel, cereal grains, parcel freight, general freight, etc.) as a guide to the commodity information required. Finally, they are requested to indicate whether the commodity is bulk or non-bulk, whether it is classified as dangerous goods, whether it is moved under refrigeration and whether or not it is containerised cargo.

#### **Release of freight statistics**

It is proposed to release a publication, *Freight Movements, Australia* (9217.0), on a quarterly basis commencing from the June quarter 1994. The publication will cost \$12.00 per issue (a subscription order form for the first year's issues is included with this paper). It is expected that the first release will be available in early 1995. The publication will provide details of the major freight flows between selected centres (covering interstate and intra-state movements) for the transport modes covered by the survey. It will also contain some commodity information in respect of these major flows. The publication will provide a time series of these statistics as progressive quarterly results become available from the survey.

In addition to the broad aggregates contained in the publication, it is expected that a detailed range of statistics will also be compiled from information obtained from the FMS. This will include, for each mode of transport, commodity (for 32 commodities, although none of these will be available for air freight movements) by origin and destination (down to the statistical subdivision level of the *Australian Standard Geographical Classification*). Data will also be produced showing freight movements classified as bulk, dangerous, refrigerated or containerised. These statistics will be available as special data services to users. Standard ABS pricing fees will apply to these services.

#### **Reliability of estimates**

Overseas and ABS experience indicate that collecting information on freight movements is a complex (and expensive) exercise. The ABS is confident that an appropriate sample survey methodology has been developed that will enable the core data requirements of users to be met. It is recognised that a crucial factor will be how representative the freight movements of the sampled businesses are of the overall freight movements in scope of the FMS. At the very broadest level (total tonnages moved between statistical divisions, excluding freight moved solely within

city or town boundaries or less than 25 kilometres in rural areas), the ABS is confident that the sampling methodology being used will yield sufficiently reliable results for most user needs. However, the extent to which the broad estimates can reliably be broken down by origin/destination details and also by commodity, has yet to be fully evaluated. This should be achieved when results from successive surveys become available and are assessed by major users and suppliers of the data. In any case, it should be appreciated that the more detailed the estimates, the less reliable they are expected to be.

As with normal practice, standard errors and relative standard errors for selected aggregates will be included in the publication, as an indication of the extent to which estimates for these aggregates might have varied by chance because information had been collected from only a sample, rather than all units.

#### **Future plans for freight movements statistics**

The new survey is considerably more comprehensive in scope and coverage and more detailed in its data content. It is therefore considerably more expensive to undertake than the interstate freight movement collection it replaces.

Resources have been provided from the ABS budget to conduct and publish broad quarterly results from the FMS for the 2 years ended March 1996. Unfortunately, constraints on the ABS budget make it highly unlikely that the collection of freight movements statistics will continue without substantial user funding. Discussions will be held with users in 1995 to determine whether they are generally supportive of the results obtained and whether it is worthwhile continuing the survey. If so, the possibility of forming a consortium of users to fund the project will be explored.

The ABS is very interested in feedback from potential users and suppliers of freight movements statistics on the matters set out in this paper. Please contact Eddie Maitland on (07) 222 6336 or Sharyn Marken on (07) 222 6190 with your views and comments or write to the ABS, GPO Box 9817, Brisbane Q 4001.

**Richard Madden**  
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22 December 1994



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To subscribe to the first year's issues of the quarterly publication, *Freight Movements, Australia* (9217.0), please complete the order form below and return it with your payment to the ABS Subscription Services, Victoria. The price for the year's subscription is \$48.00.

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