

## ROAD FREIGHT TRANSPORT IN IRELAND, 1980

B. GEOGHEGAN and G. BRADY

*(Read Before the Society, on 31st May, 1983)*

---

### INTRODUCTION

In the last quarter of 1979 a continuous sample survey of road freight transport activity was initiated by the CSO. This paper examines the methodology of the survey and provides an analysis of some of the results for 1980, identifying, in the process, elements which are considered most relevant to issues of road freight transport policy. Preliminary results for the last quarter of 1979 were issued in July 1981<sup>1</sup> and summary results for the year 1980 have been issued recently.<sup>2</sup> Data for the year 1981 are in the course of final preparation and it is expected that set-up delays having been overcome, the results for the continuing survey will be available much closer to the reference date. The survey results, in a summary form, are also communicated to the Statistical Office of the European Communities to conform with an EEC directive.<sup>3</sup>

The lack of comprehensive data on road freight transport has been recognised as a serious statistical gap for quite some time. The last (and only) full survey of road freight transport was conducted in 1964. Since then it is an understatement to say that there have been considerable developments in road transport which have reflected the growth in the economy as a whole. The results for the year 1980 show that activity measured in tonne kilometres increased threefold since 1964, while tonnes carried nearly doubled. It is appropriate, therefore, to examine in some detail the more important and interesting observations to be made in the light of this change and the new benchmark nature of the 1980 data. The social and economic issues of national transport policy continue to be the subject of intense debate, a debate, indeed, in which much publicly available reports and comments refer despairingly to the need for additional data. The Road Freight Survey goes some of the way in meeting the data requirements. It is equally clear that some additional work on patterns of passenger transport is also badly needed, subject of course, to the availability of scarce resources.

We hope in the present paper to achieve a number of objectives. The description of methodology and particularly the sampling aspects of the survey should, it is hoped, allow a fuller appreciation of the nature of the estimates particularly following discussion in this forum. Secondly, by highlighting the main conclusions, the direction and the data possibilities for further research may be made clearer. In presenting these main results, some of which bear on rather controversial issues of policy, our hope is that they will be viewed as an objective assessment of road freight transport and will help to clarify discussion on policy issues.

The paper does not deal with the whole of freight transport. It was decided to concentrate on the hitherto desert area of road freight transport statistics. A full discussion of all forms of freight transport, whether by sea or air or by rail and road, is

<sup>1</sup>“Road Freight Transport Survey October–December 1979” — C.S.O. 9 July 1981.

<sup>2</sup>“Road Freight Transport Survey, 1980 Summary Results” prl. 1550.

<sup>3</sup>E.E.C. Directive 78/546.

a topic which would merit a separate paper even perhaps a symposium, as a suggestion for one of the society's forthcoming sessions. It may, however, for the record be interesting to note the current relative shares of the inland modes, road and rail, in transport activity. The 1980 survey yields an estimate of 5011 million tonne-kilometres for road freight transport while CIE estimate rail activity at about 637 million tonne-kms. Thus rail represented about 11 per cent of the road plus rail activity in 1980, which compares with 17 per cent in 1964. Comparing the absolute figures rail activity doubled while road trebled between 1964 and 1980. As we have said this is a crude overall assessment of share and, immediately, length of haul, urban traffic and other factors must spring to mind for further consideration. If journeys partly outside the state are excluded from the road figure, the percentage breakdown of inland freight transport in the state is about 87 per cent road to 13 per cent rail in 1980.

It should, of course, also be emphasised that the activity in this country of goods vehicles registered outside the state are not included in the survey.

### *Methodology of the Survey*

As estimates are required for the total activity of vehicles, according to various classification criteria, for the whole year and since information from an individual vehicle was obtained for one week only, the sample design required a two-dimensional approach. The procedure adopted was to choose a stratified random sample of vehicles each of which was subsequently allocated to a particular week for which details of activity were sought. At the end of 1979, the register of vehicles managed by the Local Taxation Offices and the Department of the Environment had been computerised for a full year for all local offices. Thus the normal annual cycle of registration was complete and the register provided a full and convenient sampling frame for the survey. "Goods vehicles" are identified as a separate taxation class and the Department allowed the CSO to copy this file and develop its programmes to base the survey upon it. The existence of this computerised register conveyed a number of management advantages on the survey compared to the possibilities which existed for the last survey in 1964. It was decided, therefore, to computerise as much as possible of the operational systems for the running of the survey.

As new vehicles are being constantly added to the register and some scrapped ones being deleted, the selection process was done at four weekly intervals to ensure their correct representation in the survey. For the whole year 1980 a total of 22,800 vehicles were selected in the sampling procedure. The registered owner of each vehicle selected was sent a questionnaire which sought information on his type of business, as well as certain physical characteristics of the vehicle such as body type, axle configuration and carrying capacity. The questionnaire required journey details for each day of the specified week on a separate line — origin and destination of each journey, tonnage carried, distance travelled loaded and empty. To facilitate calculation of tonne-kilometres a separate section dealt with "split delivery and collection" journeys i.e. those which involved a number of loading and unloading stages. For each journey also, the respondent was asked to indicate movements into and out of the ports of railheads and whether the load was containerised or a trailer was used. Total fuel consumed in the sample week was also recorded.

It may be useful to give a brief description of the operational side of the survey. The programme used for selection of sample vehicles also provided for the printing of name and address labels. Thus the issue of questionnaires and the subsequent response history for each sample vehicle was recorded in the system. Reminder labels were issued as required and an ongoing analysis of response was possible. Returns were checked manually and queries raised where necessary (though this was kept to a

minimum). When the returns were coded they were then subjected to a rigorous programme of consistency checks. In this regard it must be said that the 1980 data are probably of a higher quality than those for the last quarter of 1979. The coding, checking and editing was considerably improved according as the learning process advanced both on the part of our systems and the respondents' familiarity with a rather formidable questionnaire.

### *Sampling scheme*

The sample selection was stratified by reference to unladen weight and year of first registration. Smaller and older vehicles were assigned lower sampling fractions than larger and new ones. The sampling fractions chosen were based upon the optimum allocation formula and used information from the 1964 survey and to some extent more recent results from the U.K. on the relationship between age of vehicle and total activity. The overall total number of vehicles to be selected took expected response rates into account but was limited by cost considerations. The stratification and sampling fractions chosen were as follows in Table 1. The variation in fraction for age group chosen was fairly minimal but this will be reviewed in the light of experience.

Table 1: *Stratification and sampling fractions*  
*Year of 1st registration*

<i>Unladen weight</i>	<i>Before 1972</i>	<i>Between 1972 and 1976</i>	<i>After 1976</i>
< 3 tons	$\frac{1}{20}$	$\frac{1}{19}$	$\frac{1}{18}$
3-6 tons	$\frac{1}{2}$	$\frac{4}{7}$	$\frac{2}{3}$
$\geq 6$ tons	$\frac{9}{10}$	$\frac{19}{20}$	$\frac{1}{1}$

The Department of the Environment's Register of all goods vehicles (whether under current licence or not) was sorted into these stratification classes and a random sample of vehicles was selected according to the above fractions in each class. The selected vehicles were allocated randomly to a particular week. In fact the selection was done at four-weekly intervals to ensure correct representation for new registrations and the deletion of scrapped vehicles from the register. The selection programme ensured that no vehicle was selected more than once in the year.

### *Response*

As has been stated this scheme selected 22,800 vehicles. In practice, of course, non-response reduced the effective sample which was about 11,500 vehicles, or about 14 per cent of the estimated population of goods vehicles in 1980. When adjustment is made for vehicles which were scrapped or were not relevant to the survey the actual response rate was about 60 per cent. While there is no doubt that an effective sample of 11,500 vehicle-weeks is more than adequate to ensure reliable estimates of the important aggregates, the characteristics and composition of the non-respondent 40 per cent required further examination.

This was approached on two fronts. First, a simple questionnaire was issued to non-respondents in a selected number of weeks. They were asked to give information as to whether the vehicle was used in the sample week and if not the reasons for its being idle. They were further asked to state their category of business. The results of this further enquiry seemed to confirm that the proportion of idle or scrapped vehicles among non-respondents was not too different from that among respondents. The

second approach was to use the register again and to classify respondents and non-respondents separately by date of expiry of latest road tax-licence. Again the differences between the patterns for respondents and non-respondents were not significant. There was no evidence, therefore, that the survey estimates were being overstated due to a disproportionate number of idle or scrapped vehicles being among the non-respondents. (We would like to emphasise that this analysis by reference to taxation patterns was a numerical exercise only and in any event used information directly available from the Department of the Environment's own records.)

#### *The survey register and grossing procedure*

It was quite important to establish this aspect of things for another reason. For technical reasons the 1964 survey covered vehicles under current licence (i.e. taxed), at a date late in 1963 plus average new registrations during the course of 1964. On this occasion, however, the survey frame includes all goods vehicles on the Department of the Environment register whether currently licensed or not. Thus, for example, the survey population of vehicles was estimated at 82,400 compared with 65,000 vehicles recorded as being under current licence on 30th September 1980. This point merits further explanation and is relevant to the comparisons between 1964 and 1980.

First, the register used for the 1980 survey was the computer file of goods vehicles built up by the Department of the Environment from the end of 1978. According as vehicles were newly registered or their road tax was renewed they were added to the computer register. Our estimate of 82,400 vehicles consists then of all goods vehicles, whether or not currently taxed, which were on this register at the end of 1979 plus average new registration less scrappage as estimated from the sample (making allowance for deletions by the Department in the course of the year).

The difference between this figure and the census at 30th September does *not* imply that a large number of owners escape paying road tax at all! The census refers to vehicles currently taxed at 30th September and thus excludes those whose licence expired on 31st August (or earlier) and had not been renewed by 30th September. (Our further analysis of the register showed, in fact, that only a small proportion of goods vehicles remained untaxed after a period of 12 months.) There has been some independent confirmation that the larger figure does not represent an overstatement of the numbers of goods vehicles on the road. In a presentation<sup>4</sup> to a symposium on "The Impact of Heavy Goods Vehicles in Ireland", organised by An Foras Forbartha, Mr. D. McIlraith referred to a visual survey in August 1979 which showed that 22 per cent of goods vehicles observed on the road were either carrying an expired tax disc or were displaying none at all.

The situation for the 1964 survey was rather different in a number of respects. Vehicles could only be taxed at quarterly intervals and the frame was sampled in November 1963, nearly two months after the end of the quarter. At that stage it is likely that a sizeable proportion of "late" vehicles would have been taxed. As the sampling was done manually, this aspect was noted in the extraction. While a full re-assessment is not possible now, it is evident that any understatement arising from taking only currently licenced vehicles in 1964 in this way was not nearly as significant as it would be in 1980. We have not therefore, in this paper, adjusted the 1964 data in any way. It is suggested that comparison of aggregates may slightly overstate growth but that structural comparisons are hardly affected.

The grossing procedure used to bring the sample results up to national estimates was quite straightforward. Some post-stratification was introduced to treat separately

<sup>4</sup>"Patterns of Truck Operation and Travel in Ireland" — D. McIlraith, Department of the Environment.

those vehicles which were originally indicated to be for "hire and reward", at the time of first registration. The number of sample and population vehicles in each class were then multiplied by a factor representing the total number of vehicle-weeks divided by the number of sample vehicle-weeks in that class. The results for each quarter were then added to derive annual totals. It is proposed to maintain the quarterly element in the procedure which should isolate seasonal factors as soon as a long enough series is available.

#### *Sampling error*

Needless to remark, the results given here are subject to sampling errors. It has been possible to make estimates of the magnitude of these errors which should be referred to when the detailed tabulations particularly are being interpreted. We have calculated the errors for tonne-kilometres as this is considered to be the most appropriate measure for assessment of the volume of road freight transport activity. Further refinement of the estimation of the sampling errors may be possible, when we have two or more years data.

In Table 2 we set out the standard errors of the estimates for the unladen weight classes and the age classes used in the sample stratification and also for all vehicles.

Table 2: *Sampling errors for tonne-kms. 1980: (i) by unladen weight\*; (ii) by year of 1st Registration; (iii) all vehicles.*

	(1)	(2)	(3)
(i) <i>Unladen Wt.</i> ( <i>Imperial wt.</i> <i>classification</i> )	<i>Estimated</i> <i>tonne-kms</i> <i>million</i>	<i>Standard error</i> <i>of the estimate</i> <i>million tonne-km</i>	<i>Twice S.E. as</i> <i>% of estimate</i> <i>%</i>
< 3 tons	260.6	22.0	16.9
3-6 tons	781.1	18.5	4.7
≥ 6 tons	3,968.8	67.3	3.4
(ii) <i>Year of 1st registration</i>			
Before 1972	260.5	18.7	14.3
1972-1976	1,327.6	36.8	5.5
After 1976	3,422.4	60.5	3.5
(iii) <i>All vehicles</i>	5,010.5	73.2	2.92

\*The unladen weight classes here are in imperial units as used in the sample stratification. The body of results presented later are in metric giving rise to some difference at the limits.

Column (1) gives the estimated tonne-kms. for each category and column (2) its associated standard error. The percentage error is given in column (3). Thus, the 95 per cent confidence interval for total tonne-kms, lies within  $\pm 2.92$  per cent of 5,010.5 million i.e. between 5,156.8 and 4,864.2 million tonne-kms. Quarterly estimates of total tonne-kms. have percentage sampling errors ranging between 5.3 per cent and 5.8 per cent.

The Table shows fairly clearly the care with which estimates for the various sub-classifications should be interpreted. Thus the errors for estimates relating to smaller size vehicles and to vehicles registered before 1972 are about 17 per cent and 14 per cent respectively. These categories of vehicles, however, account for only 5 per cent of total activity. Clearly, when data are cross-classified by reference to a number of characteristics the errors can become quite significant, particularly, for cells for which the sample was small. In the case of certain topics it may be possible to pool estimates

based on the samples for a number of years to yield better results. This could be a useful approach for the detailed examination of some structural data.

As we have mentioned every effort was made to eliminate inconsistencies in the data received. While some non-sampling errors are present in all surveys there does not appear to be evidence of bias in the estimates. The relatively large non-response is a factor which must give rise to some concern but the examination of this has been satisfactory and it is being monitored further for the continuing survey.

## *RESULTS OF THE SURVEY*

### *General*

The survey offers many different possibilities for analysis. We have chosen a number of features on the basis of their general interest and in some cases topicality. The question arose as to whether there was any point in making comparison with 1964 at this remove. Many in the transport business either professionally, or, as part of another productive activity, would suggest that things have changed so much that comparison is irrelevant. This may be so in some respects but there remains the fact that, because of the lack of data, the 1964 material is still being widely used, if only as a benchmark, by lobbyists and commentators alike up to the present. It seems then that the change, drastic as it has been, needs to be documented.

### *Developments since 1964*

The basic methodology of the 1964 survey was much as has been described for the present one but there were differences, some of which we have mentioned and others we shall refer to later. In making these comparisons, as has been stated, it is not proposed to make any adjustment to the 1964 data, arising from the above mentioned difference in approach to total population, but we will say that the comparison of aggregates as in Tables 3 and 4 may be slightly overstated.

Table 3 below illustrates the changes which have taken place in activity since 1964. Tonnes carried and vehicle-kilometres nearly doubled while there was almost a three-fold increase in tonne-kilometres performed (this latter, as we have said, most realistically measuring transport activity).

*Table 3: Development in Road freight activity - 1964-1980*

<i>Aggregate</i>	<i>1964</i>	<i>1980</i>	<i>Ratio 1980 to 1964</i>
	million		ratio
Tonnes carried	55.5	102.5	1.85
Vehicle kms.			
loaded	460.4	808.9	1.76
empty	210.0	444.1	2.11
total	670.4	1,253.0	1.87
Tonne-kms.	1,714.6	5,010.5	2.92

One important point, which should be mentioned here, is that we have included in the analyses journeys of Irish hauliers which originated or terminated outside the State. Since we are mainly concerned with the performance of the Irish road transport fleet, it was considered desirable to follow this treatment. Nevertheless there are, of course, uses of the data for which it would be better to exclude those journeys and this can be done. The magnitude of this activity in 1980 was about 580 million tonne-kilo-

metres or about one ninth of the total. We shall return briefly to this topic later in the paper.

We shall deal with the central topic of “business of owner” later but, firstly, it is useful to put the discussion in the context of the overall changes in fleet performance since 1964. The 1980 fleet figures used in these comparisons are assigned to the various classification on the basis of the sample estimates. The most significant change in the fleet has been the enormous increase in the numbers (and size) of heavier vehicles. In 1964 78 per cent of goods vehicles were less than 3 tons unladen weight while just under 4 per cent had unladen weight in excess of 5 tons. By 1980, (we have converted the U.I.W classes to metric in the processing) just under 64 per cent of goods vehicles were under 3 tonnes unladen weight and almost a quarter were in excess of 5 tonnes. Table 4 sets out the numbers of vehicles under current licence in Autumn 1964 and 1980, together with the fleet population used for the 1980 survey by unladen weight class.

Table 4: *Numbers of vehicles by unladen weight, 1964 and 1980*

<i>Unladen weight</i>	<i>Under current licence</i>		<i>Estimated population of goods vehicles 1980 Survey (metric U.I.W classes)</i>
	<i>31/8/1964</i>	<i>20/9/1980</i>	
< 3 tons	36,170	42,829	52,300
3–5 tons	8,250	8,621	11,100
5–10 tons		9,877	13,800
≥ 10 tons	1,760	3,129	5,200
<b>Total</b>	<b>46,180</b>	<b>64,456</b>	<b>82,400</b>

It is of interest to examine how these different categories of vehicles were worked in 1964 and 1980. (For simplicity we refer to “tonnes” in the U.I.W classes although we have not converted the 1964 classes to metric — tons carried etc. are however, adjusted.) Table A in the Appendix gives the details of performance in terms of tonnes carried, vehicle kilometres and tonne-kilometres. Calculating the averages per vehicle, the smallest change occurred for the vehicles of less than 3 tonnes unladen weight. Vehicle kilometres per vehicle for these were estimated at 9,300 kms. in 1964 and 9,000 kms. in 1980 and tonne-kilometres per vehicle were 6,200 in 1964 and 4,500 in 1980. There was a striking change, however, in the work done per vehicle of 3–5 tonnes unladen weight. In 1964 these vehicles were estimated to have travelled an average 30,000 kms. compared with 18,000 kms. in 1980 and to have performed an average 122,000 tonne-kms. compared with 37,000 in 1980. Clearly vehicles of this size were doing completely different work in 1964. The heavier loading over longer distances has been shifted on to the more economic larger vehicles. While it is not possible to go into full detail here, it is evident that work contributing heavily to tonne-kms. such as gravel, cereals, petrol and other fuel transport is being done by heavier vehicles. The impact of this change in the pattern of road haulage is put even clearer in focus when one notes that total tonne-kms. performed by vehicles in the 3–5 tonne class fell by about 60 per cent between 1964–1980 while there was a tenfold increase in activity by vehicles of over 5 tonnes unladen weight. It is interesting to tabulate the average vehicle kilometres performed in the different weight classes and these are shown in Table 5.

It is interesting to note that even with the inclusion of a (relatively small) number of international journeys the average vehicle kilometres performed by the heaviest vehicles did not increase between 1964 and 1980 (in fact decreased if one takes the greater than 5 tonne group as a whole). One can speculate that this says something

Table 5: *Average vehicle kilometres by unladen weight 1964 and 1980*

<i>Unladen weight</i>	<i>1964</i>	<i>1980</i>
	kms. per vehicle	
< 3 tonnes	9,300	9,000
3-5 tonnes	31,000	18,000
5-10 tonnes		25,000
≥10 tonnes	44,000	46,000

about the relative degree of traffic congestion but (perhaps) also may reflect the increasing centralisation of industrial activity in urban/suburban areas. This point will merit a more detailed examination.

Finally, it is possible to match approximately the length of haul categories used in the analysis of the 1964 results to compare with the metric presentation of the 1980 survey results. Table 6 shows the tonnage carried by length of haul in each year.

Table 6: *Tonnes carried by length of haul 1964 and 1980*

<i>Year</i>	<i>0-9 km.</i>	<i>10-49 km.</i>	<i>50-149 km.</i>	<i>150× km.</i>	<i>Total</i>
1964	21.1	24.2	8.6	1.6	55.5
1980	25.3	50.3	19.9	7.0	102.5

Tonnage carried over short distances (less than 10 kms.) showed little change between 1964 and 1980 in absolute terms, but as a percentage of total tonnage dropped from about 40 per cent to 25 per cent. In general though road haulage distances have increased considerably. There was an increase of 26 million tonnes carried on distances between 10 and 49 kms. while about 17 million tonnes more were carried for distances in excess of 50 kms. The relatively small but growing international haulage contributed to the 7 million tonnes carried for distances in excess of 150 kms.

In summary then the 1980s compare with the 1960s in terms of much greater numbers of heavy vehicles carrying heavier loads over longer distances, contributing to the huge increase in tonne-kilometres. This appears to have been accompanied by a drop in annual vehicle-kilometres for comparable sizes of vehicle, with the larger size classes not taking over the role of the intermediate classes.

#### *Road Freight Transport by Business of Owner*

The road freight survey is, as we have seen, based upon a sample of goods vehicles randomly selected from the register. The survey however, does, provide a basis for examination of activity classified by business of owner. Each respondent is asked to state his principal type of business and whether the selected vehicle is mainly used for hire or reward or for Own Account carriage. In addition, in the case of vehicles operating under a merchandise licence, details of the licence are sought. The replies to these questions are cross checked and coded appropriately. Thus, we derive an analysis based on the usual usage of the vehicle and, while it would be possible to refine this by seeking details for each journey, it is doubtful if the estimates would differ greatly. The survey results indicate considerable growth in the proportion of activity accounted for by firms engaged in transport for hire or reward by comparison with the 1964 estimates. It is perhaps appropriate then to devote a little time to the definitions being used before we examine the results.



In the 1964 survey the main results were presented under the categories "hire and reward" and "own account". The former category embraced the activity of vehicles operated under road merchandise transport licences (including, of course, all CIE vehicles). All other vehicles were classified as "own account". It was recognised that a certain amount of haulage for hire or reward was done within prescribed distance limits of the main cities by operators who did not hold merchandise licences. This activity was small in volume and carried out on a part-time basis, in the main. This activity was included with "own account".

The 1980 results are presented a little differently but valid comparisons can be made. There was a choice as to whether the "business of owner" categories or the "hire and reward"/"own account" split based upon the use of the vehicles should be emphasised in the presentation. The standard classification of business by industrial activity was used and thus operators mainly engaged in licensed or unlicensed haulage were classified as "Transport". Clearly a certain amount of carriage on own account is done by hauliers (including for example CIE) and equally some firms whose main activity is recorded as not in haulage are holders of road merchandise licences. The volume of such activity is quite small as a percentage of total (0.3 per cent of all tonne-kms. are done on own account by transport firms and 2.3 per cent of all tonne-kms. are hire and reward activity by non-transport firms).

Thus the business of owner category "Transport" is a little narrower in scope than the category "Hire and Reward". We considered that the main interest in this was effectively in a comparison of hauliers' activity with that of others. Table 7 summarises the changes in tonne-kilometres performed between 1964 and 1980 by business of owner.

Table 7: *Tonne-kilometres by business of owner, 1964 and 1980*

<i>Business of Owner</i>	<i>1964</i>	<i>1980</i>	<i>Ratio 1980 to 1964</i>
	million tonne-kms.		
Transport			
licensed	293.5	1,770.7	} 6.51
other	*	140.7	
Industry			
(incl. construction)	739.6	1,875.8	2.54
Other	681.5	1,223.3	1.80
<b>Total</b>	<b>1,714.6</b>	<b>5,010.5</b>	<b>2.92</b>

\*Not included in 'Transport' in 1964.

Between 1964 and 1980 the proportion of work done by the transport sector measured in tonne-kilometres has increased from about 17 per cent to just under 40 per cent. The inclusion of unlicensed haulage in the 1980 "transport" figures does not significantly affect matters. Table B in the Appendix gives further details of this comparison and it can be seen that in the case of each measure of activity there has been a shift towards professional transport. This is an important finding of the 1980 survey and merits a little more examination. There has been a number of developments since 1964 which have encouraged the professional haulage sector. Legislation has the effect of "liberalising" the road transport market in some respects. The 1971 Road Transport Act removed restrictions on the weight of vehicles operated under road merchandise licences and permitted most licensed hauliers to carry goods anywhere within the State. In addition, the carriage of livestock was no longer subject to licensing. The more

recent 1978 Road Transport Act allowed a licensed haulier to increase his fleet sixfold, subject to an overall maximum of 80 vehicles per operator. There was further liberalisation of carriage of agricultural produce at harvest time and international haulage was opened up to any Irish haulier with a Road Freight Certificate (certifying competence etc.). In another context the development of greater flexibility in the technology of transport with increased containerisation and lift-on/lift-off and roll-on/roll-off facilities at the ports have also contributed to the growth of professional haulage. The effect of these legislation and other changes is evident in the comparisons between 1964 and 1980. The analysis of activity by length of haul and by size of vehicle for hauliers and other operators throws some light on these comparisons. Table 8 gives tonnage carried by length of haul in 1980, for transport firms and others and the percentage of total in each distance class accounted for by "Transport" is shown for 1980 and 1964.

Table 8: *Tonnage carried by length of haul and business of owner 1980 - percentages 1964 and 1980*

<i>Length of haul</i>	<i>Business of owner</i>			<i>% carried by 'Transport' firms</i>	
	<i>Transport</i>	<i>Other</i>	<i>Total</i>	<i>1964</i>	<i>1980</i>
	<i>million tonnes</i>				
0-9 kms.	6.7	18.6	25.3	25	26
10-49 kms.	9.7	40.6	50.3	15	19
50-149 kms.	5.6	14.2	19.9	19	28
150 kms.	3.6	3.4	7.0	18	52
<b>Total</b>	25.7	76.8	102.5	20	25

The effect of the 1971 Act is evident in the comparative percentage for 1964 and 1980. In 1964 the hauliers share of total tonnage was about one fifth and they held their greatest proportion of the market in the shortest distance class. The 1980 figures are in sharp contrast to these. The hauliers' share has grown in each distance class and they carried one quarter of total tonnage. In the category 0-9 kms. the change in market share is slight but in the longest distance class i.e. more than 150 kms. hauliers carried more than half the total tonnage. This latter category includes a large proportion of tonnage carried on journeys outside the state which are predominantly performed by transport firms.

While we do not intend to examine international haulage in detail it may be of interest to note that about 1½ million tonnes were carried on journeys which had their origin or destination outside the State.

Table 9 gives the other relevant analysis showing activity measured in tonne-kilometres by size of vehicle operated by Transport firms and others in 1980, together with percentages for each size category in 1964 and 1980.

Activity in the smallest size class continues to be dominated by own account transport and there was little change between 1964 and 1980. As remarked earlier the volume of activity accounted for by vehicles in the 3-5 tonne category fell significantly between 1964 and 1980. Vehicles owned by transport firms performed a smaller proportion of activity (14 per cent) in this size class. As we have seen also the largest growth in activity was in the heaviest vehicles. The more liberal licencing arrangements prevailing in 1980 are evident in the fact that 42 per cent of tonne-kilometres in this heaviest category were accounted for by transport firms.

We have examined some of the more interesting structural changes in the road transport market between 1964 and 1980 with the emphasis on work done by

Table 9: Tonne-kilometres by unladen weight 1980 – percentages 1964 and 1980

unladen wt.	Business of Owner			% tonne-kms. by Transport firms	
	Transport	Other	Total	1964	1980
	million tonne-kms.				
<3 tonnes	3.9	231.7	235.6	3%	2%
3–5 tonnes	57.2	354.5	411.7	18	14
≥5 tonnes	1,850.3	2,512.9	4,363.2	21	42
<b>Total</b>	<b>1,911.4</b>	<b>3,099.1</b>	<b>5,010.5</b>	<b>17</b>	<b>38</b>

Transport firms, compared with the mainly own account activity of other vehicle operators. There are some further aspects of this market split in 1980 which may be relevant to the debate on “liberalisation”.

#### *Type of journey*

We have not so far looked at the effect of the type of journey on the pattern of activity. We distinguish two types viz. ‘end-to-end’ and ‘split delivery and collection’. The former involves a single operation of loading and unloading while in the latter a number of intermediate deliveries and/or collections are made. Table C in the Appendix shows tonnes carried and the number of loaded journeys by unladen weight and business of owner for each type of journey. This table clearly shows the concentration of activity by Transport firms in “end-to-end” journeys using vehicles greater than 5 tonnes unladen weight. It is interesting also to note that over 60 per cent of tonnage on “split delivery and collection” journeys is carried on vehicles in excess of 5 tonnes unladen weight. We have derived average loads per loaded journey for each of these categories and these are given in table 10 below (we have used full figures in the calculation).

Table 10: Average load per loaded journey by unladen weight, business of owner and type of journey, 1980

Type of journey and unladen weight	Transport	Other	Total
	Average tonnes per loaded journey		
<b>End-to-end</b>			
<3 tonnes	0.6	0.7	0.7
3–5 tonnes	4.9	4.6	4.6
≥5 tonnes	14.9	12.7	13.3
<b>Total</b>	<b>12.6</b>	<b>5.9</b>	<b>7.0</b>
<b>Split delivery and collection</b>			
<3 tonnes	0.5	1.2	1.2
3–5 tonnes	3.4	4.3	4.2
≥5 tonnes	11.0	10.4	10.5
<b>Total</b>	<b>6.3</b>	<b>3.9</b>	<b>4.0</b>

The average load for all vehicles operated by transport firms both on “end-to-end” and “split delivery and collection” journeys is considerably greater than for own account operators. This is due to the different “mix” of vehicles sizes and the unladen weight classification shows a much more uniform picture. The only significant

difference here is the 2 tonne per journey greater loading by Transport operators in the heaviest unladen weight category. Again it is perhaps surprising to find such heavy average loads in "split delivery and collection" journeys. This is a considerable change from the pattern in 1964. It is not possible here to go into commodity analysis of this aspect. Suffice it to point out that about 50 per cent of tonnage carried in "split delivery and collection" journeys consists of deliveries to retailers or to households and the trend we see here is entirely consistent with the concentration of retail (particularly grocery) outlets since 1964.

Empty running is another factor which is relevant to discussion on the business of owner classification. We shall briefly look at the loaded vehicle — kilometres as a percentage of total for hauliers and others, separating also the type of journey involved. Table 11 gives the details.

Table 11: *Number of loaded vehicle kilometres as a percentage of total by unladen weight, business of owner and type of journey.*

<i>Business of owner and unladen weight</i>	<i>End to End %</i>	<i>Type of journey Split delivery and collection %</i>	<i>Total %</i>
<b>Transport</b>			
< 3 tonnes	46.3	97.9	60.5
3-5 tonnes	51.7	96.5	67.2
≥ 5 tonnes	62.1	96.4	64.6
<b>Total</b>	<b>60.9</b>	<b>96.5</b>	<b>64.7</b>
<b>Other</b>			
< 3 tonnes	54.5	97.3	69.2
3-5 tonnes	48.2	96.7	64.7
≥ 5 tonnes	51.0	95.0	59.0
<b>Total</b>	<b>52.0</b>	<b>96.6</b>	<b>64.5</b>

The fact that the "split delivery and collection" percentages are close to 100 is a consequence of the definition of "journeys" used in the survey which implied that any empty return trip to base (either from an "end-to-end" or "split delivery and collection" out ward trip) was treated as a separate "empty end-to-end" journey. Thus for a typical oil tanker delivering to retail outlets the trip would consist of a split delivery and collection" (delivery only in this case) outward journeys and an empty return "end-to-end" journey. Thus "split delivery and collection" journeys are virtually all loaded journeys by definition. This contrasts with the treatment in the 1964 survey which used a different questionnaire design in this report. Thus the loaded/empty kilometres analysis for separate types of journey cannot be compared for the two years. However, comparisons made between the two years concerning tonnes carried and **number** of loaded journeys is unaffected by this difference in approach.

Bearing this definitional point in mind we can examine the implications of Table 11. Own account operators are much more heavily involved in "delivery and collection" activity than are hauliers. This is partly reflected in the considerably lower overall percentage of loaded kilometres for the own account operators on "end-to-end" journeys, 52 per cent compared to 61 per cent. This difference is virtually eliminated in the total column combining the types of journey, although in the important heaviest weight class the difference 59 to 65 per cent indicates greater vehicle efficiency by the hauliers. This is perhaps the relevant figure to help in the consideration of policy as to

whether own account operators should be allowed to backload for reward. We must emphasise, however, that Table 11 can be seen only as a first step in this consideration. A number of other cross-classifications would be relevant. The commodity analysis could isolate special cases such as fuels for example or analysis by body type could identify tankers or refrigerated vehicles. Thus, subject again to sampling errors it may be possible to cast further light on this rather complex issue. The point must, be whether the survey details can help to isolate those areas of transport activity (in terms of vehicle type and type of work) where operators who carry their own goods are in a position to compete for hire and reward haulage. The experience in other countries where this is permitted is that these areas are, in fact, rather limited.

#### *Business of owner - international comparisons*

It may be appropriate, at this stage, to look at the situation in the other Member States of the EEC with regard to own account and hire and reward carriage. Under EEC Directive 546/78 each Member State is obliged to conduct surveys of road freight transport on an annual basis. Definitions and scope of the data to be supplied to the Statistical Office of the European Communities have been aligned, although the methodology used varies considerably from country to country. Thus some of the surveys are based upon a combination of journey records for national transport and data collection at the borders for international transport. For our present purpose it would be as well to exclude international road transport which, relatively speaking, is more important on the continent than for an island country where sea transport forms a larger share of international trade.

Therefore, for Ireland, we shall also exclude journeys with origin or destination outside the State from the comparison. The following Table 12 summarises the composition of total tonne-kilometres in terms of activity entirely within the State and that which is at least partly outside it.

Table 12: Road freight transport inside and outside the State

<i>Business of Owner</i>	<i>Tonne-Kms. (Millions)</i>	<i>%</i>
<b>Transport</b>		
Internal Journeys	1,406	28
External Journeys	506	10
<b>Other</b>		
Internal Journeys	3,027	60
External Journeys	<u>72</u>	<u>2</u>
<b>Total</b>	5,011	100

Again it should be noted that not all the tonne-kilometres of "external" journeys are performed outside the state: this would be particularly true of journeys to and from Northern Ireland. One remark to be made arising from Table 12, before proceeding to international comparisons, is that it is very clear that our island situation puts international road transport firmly in the hands of professional hauliers who are in a position to negotiate and carry backloads.

Table 13 summarises the hire and reward/own account split for national transport (i.e. excluding all international journeys) in the EEC countries. For Ireland we have excluded the 578 million tonne-kms. on external journeys which reduces the percentage attributable to hauliers compared to our earlier analyses.

Table 13: *Tonne-Kilometres for hire and reward transport in EEC countries as a percentage of national transport, 1980* (journeys within each country by its national fleet)

	% tonne-kms.
Germany	58
France	51
Netherlands	66
Belgium	42
Luxembourg	21
U.K.	61
Denmark	68
Ireland*	32

§Percentage performed by transport firms.

Data are not readily available for Italy or Greece. Clearly, even with the growth in professional haulage in Ireland since 1964, hauliers here have not captured as large a slice of the market as in most of the EEC countries. Belgian and Luxembourg hauliers are also somewhat below the average. This picture is also borne out by Table 14 which shows the percentage of tonnage carried for hire and reward in national transport in EEC countries by length of haul.

Table 14: *Percentage of tonnage for hire or reward by length of haul in national transport, 1980*

	Length of Haul				Total %
	0-49 kms. %	50-149 kms. %	150-499 kms. %	500+ kms. %	
Germany	38	50	63	86	41
France	23	36	52	68	29
Netherlands	59	56	63	—	60
Belgium	34	45	48	—	36
Luxembourg	13	28	—	—	15
U.K.	46	49	69	83	50
Ireland*	25	30	50	—	28

\*Percentage performed by transport firms.

Table 14 confirms that the Irish hauliers' penetration of the shorter distance market is somewhat less than the average. It also brings out some differences which may reflect the considerable variation in the regulation and licensing procedures in the different countries. A surprising feature is the low percentage of tonnage carried for hire or reward in the shorter distance classes in France where short-haul transport is completely "liberalised". It is interesting also to note the similarity in the patterns for the U.K. and Germany where two completely different systems apply, the former applying full "liberalisation" (other than for quality and safety controls) and the latter enforcing a full system of administrative regulation of the market. A further point is that in some of these countries (the U.K. in particular) firms, who carry their own goods, can also be licensed (or are free) to carry for reward. Irish policy as evidenced by the 1971 and 1978 Road Transport Acts and bolstered by the Report of the Transport Consultative Commission on Road Freight Haulage is clearly in the direction of

“liberalisation”. The analysis presented earlier, along with these international comparisons, paints a less extreme picture of the market structure in Ireland than pertained in 1964. The haulage industry appears to have responded positively to the legislative measures and also to the potential of international transport but the international comparisons may indicate further possibilities for change.

#### *Road Transport Activity by Region*

The information on origin and destination, given for each journey for the sample vehicle-week, permits a regional analysis of the survey results. In fact the data are coded to an area listing essentially based on counties and subdivisions of counties as well as identifying the larger towns. In addition as was mentioned movements into and out of ports and railheads were separately coded. For international journeys the foreign country of origin or destination was coded. The detailed publication of results in preparation will contain a number of tabulations giving the flows of goods to and from these entities insofar as the sampling errors allow. We here intend to take a preliminary look at the flows related to the planning regions. Table D, in the Appendix, consists of an origin-destination matrix for these regions but with Dublin city shown separately and also distinguishing flows into and out of the State.

The tonnages on the diagonal representing intra-regional flows dominate the matrix perhaps to a surprising extent. This was the pattern also which emerged from the 1964 survey. Tonnage originating in the East Region, as a whole, represented about 30 per cent of the total and of this nearly 80 per cent remained within the region (at least as far as road transport is concerned).

The South-West region, in particular, also accounts for an exceptionally high tonnage and in this case about 90 per cent of it is intra-regional. One might have expected that a higher proportion of the 22 million tonnes originating in the South-West region would have destinations either in South-East or Mid-West regions.

As mentioned above the more detailed analysis to come may clarify this to some extent. It may be of interest here to relate the regional tonnages to population in order to standardise the comparisons somewhat. Table 15 shows tonnage originating in the region (taking the East as a whole in this case and omitting the externally originating tonnage) and the corresponding averages namely, (i) per head of population aged 15 and upwards and (ii) per person at work in agriculture and industry.

Table 15: *Tonnage originating in each region 1980*

<i>Region of Origin</i>	<i>million Tonnes</i>	<i>Tonnes per head* of population 15 years and over</i>	<i>Tonnes per person* at work in Industry and Agriculture</i>
East	29.1	32.3	176.0
South East	14.3	54.9	208.3
South West	22.3	60.4	245.8
Mid West	9.4	44.3	164.5
West	7.0	34.3	132.7
North West/Donegal	4.5	30.8	131.8
North East	7.8	58.0	203.9
Midlands	7.5	41.6	151.7
<b>Total</b>	<b>101.9</b>	<b>42.4</b>	<b>183.2</b>

\*Population as estimated from the sample analysis of the 1981 Census.

The wide disparities in the tonnage originating in the various regions are considerably less when population or workforce is taken into account. The averages per head of populations are highest in the South-West, North-East and South-East regions and the lower levels of industrialisation are reflected in the figures for the West and North West/Donegal regions. The low average of 32 tonnes per head for the East region is explained by the concentration of services and administrative activity in the Dublin area. Using persons at work in industry and agriculture to standardise the comparisons brings the East Region closer to the average but the average tonnage for the South West Region remains particularly high.

*Region and length of haul*

In Table E in the Appendix we have tabulated the tonnages originating in each region by length of haul. This gives an alternative presentation of the regional spread of road transport activity. In Table 16 below we show the derived percentages for the various length of haul classes for each region. The Dublin city and suburbs area, of course, stands apart from the more mixed urban/rural regions, but it is interesting to note that 75 per cent of tonnage originating in the Dublin area has destination within 50 kms. of its starting point. The West and North-West Donegal regions also have relatively larger proportions in the shorter distance classes, again reflecting their lower concentration of industrial activity. A striking feature of the table is that over each of the regions (Dublin excluded) roughly one half of tonnes originating are carried between 10 and 50 kilometres from their origin. The effect of the roll-on/roll-off traffic of international journeys is seen in the higher proportions of tonnage carried for longer distances originating in the South-East and in the Dublin area.

Table 16: *Percentage of tonnes originating in each region for each length of haul category*

Region of origin	Length of Haul				Total
	0-9 km.	10-49 km.	50-149 km.	150+ km.	
	% on tonnes carried				
Dublin city and suburbs	37.0	37.8	15.4	9.8	100-
Rest of East	23.0	53.8	16.3	6.9	100-
South East	21.1	47.2	23.8	8.0	100-
South West	24.0	52.4	18.5	5.1	100-
Mid-West	19.5	51.7	22.5	6.3	100-
West	27.1	49.9	19.3	3.7	100-
North West/ Donegal	27.7	49.4	17.3	5.6	100-
North East	17.7	53.7	22.6	5.9	100-
Midlands	21.4	52.6	21.5	4.5	100-
<b>Total</b>	<b>24.7</b>	<b>49.1</b>	<b>19.4</b>	<b>6.8</b>	<b>100-</b>

We have here given a brief resume of some of the features of inter regional road freight transport. This summary has probably raised as many questions as it has answered but it is hoped that the broad framework for further regional analysis has been clarified.

*Road freight transport and certain vehicle characteristics*

We have looked at the growth in the vehicle fleet and have studied some aspects of



activity classified by unladen weight of vehicle. It may be useful now to take a closer look at activity in the context of certain physical characteristics of the vehicles.

#### *Age of vehicle*

Since we stratified the sample by reference to age of vehicle (albeit not very strongly), it is appropriate to examine activity by age. First, Table 17 gives the estimated population of vehicles as used in the survey by year of first registration.

Table 17: *Estimated Numbers of goods vehicles by year of first registration*

<i>Year</i>	<i>No. of vehicles</i>	<i>%</i>
1978-'80	33,600	40.7
1975-'77	21,600	26.2
before 1975	27,200	33.0
<b>Total</b>	<b>82,400</b>	<b>100-</b>

It should be mentioned that the figures given here and the further analysis by age are based upon grossed up sample estimates. Thus the figures in Table 17 represent the average situation through 1980 rather than the vehicles at a particular date in the year and, as with any of the other data, are of course subject to sampling errors. In summary, about one third of goods vehicles in 1980 were first registered before 1975, roughly a quarter in the years 1975 to 1977 and the remaining 40 per cent in 1978 to 1980. We have classified the activity by the groups of ages in Table 18 below.

Table 18: *Road freight activity 1980 by year of first registration of vehicle*

<i>Year of first Registration</i>	<i>Tonnes million (4)</i>	<i>Vehicle kms. million (%)</i>	<i>Tonne-kms. million (%)</i>	<i>No. of loaded journeys million (%)</i>
1978-80	50.7 (49)	705.6 (56)	2873.2 (57)	8.0 (48)
1975-77	28.5 (28)	337.3 (27)	1,372.3 (27)	4.7 (28)
1970-74	20.1 (20)	179.1 (14)	682.0 (14)	3.3 (20)
before 1970	3.2 (3)	31.0 (3)	83.0(2)	0.7 (4)
<b>Total</b>	<b>102.5 (100-)</b>	<b>1,253.0 (100-)</b>	<b>5,010.5 (100-)</b>	<b>16.6 (100-)</b>

Nearly 60 per cent of activity, measured in tonne-kilometres, is done by vehicles less than three years old, while almost 85 per cent is accounted for by vehicles less than six years old. The proportion for total vehicle kilometres are almost identical to those for tonne-kilometres. In terms of tonnes carried and number of loaded journeys, the older vehicles (i.e. those less than eleven but more than six years old) account for slightly higher percentages of activity. For all measures the vehicles more than eleven years old contribute a very small percentage of total activity. Remarkably enough, the average tonnage per loaded journey does not appear to drop significantly for vehicles up to eleven years old: for the 1978-80 group the average is 6.4 tonnes and it remains at 6.1 tonnes for the 1975-77 and 1970-74 group but drops to 4.7 tonnes for the oldest vehicles. At the same time the proportion of vehicles in the heaviest weight class is not very different in each of these three age groups. However, tonne-kilometres per vehicle is about three times greater for vehicles less than three years old than for those which are six years old or more. Road freight performance on this basis then is very strongly

linked to age of vehicle and it would appear that the stratification by age in the sample could, with some advantage, be more strongly emphasised. It will be interesting to re-examine these proportions when data for 1981 and 1982 are available, years when the current economic recession began to be felt and investment in new vehicles was slower.

A final analysis in Table 19 follows for this classification where we show tonne-kilometres by age and business of owner.

Table 19: *Tonne-kilometres by year of first registration and Business of Owner*

<i>Year of first Registration</i>	<i>Transport Million Tonne-Kms. (%)</i>	<i>Business of Owner</i>		<i>Total Million Tonne-Kms. (%)</i>
		<i>Other Million Tonne-Kms. (%)</i>	<i>Other Million Tonne-Kms. (%)</i>	
1978-80	1,143.5 (60)	1,729.7 (56)		2,873.2 (57)
1975-77	542.7 (28)	829.6 (27)		1,372.3 (27)
Before 1975	225.2 (12)	539.8 (17)		765.1 (14)
<b>Total</b>	<b>1,911.4 (100-)</b>	<b>3,099.1 (100)</b>		<b>5,010.5 (100-)</b>

Transport firms perform just a slightly higher proportion of their tonne-kilometres in the newest category of vehicles, but the table indicates little significant difference between the professional hauliers and the own-account operators. It is a comparison which also could be affected, perhaps, by changes in economic activity from year to year and particularly by the market for international road haulage.

#### *Type of vehicle*

We now give some summary results from a new feature of the road freight survey. The questionnaire includes a set of diagrams indicating different types of vehicle, rigid, rigid plus trailer and articulated. In addition for each of these types a number of different axle configurations were indicated. The respondent was asked to tick the diagram which represented the configuration for the sample vehicle. It is considered that the quality of response to this question was quite good. Time and space does not permit anything near a full presentation of the data, so we shall here concentrate on the main type of vehicle classification only.

Table 20 shows the estimates for numbers of vehicles in the different categories. We have included the category "rigid with trailer" in the "rigid" column.

Table 20: *Numbers of Vehicles by type and unladen weight, 1980*

<i>Unladen weight</i>	<i>Rigid</i>	<i>Type of Vehicle</i>		<i>Total</i>
		<i>articulated</i>	<i>articulated</i>	
<5 tonnes	52,300	—		52,300
3-5 tonnes	11,000	100		11,100
5-10 tonnes	10,300	3,500		13,800
≥10 tonnes	1,100	4,100		5,200
<b>Total</b>	<b>74,700</b>	<b>7,700</b>		<b>82,400</b>

About 15 per cent of "rigid" vehicles are over 5 tonnes. Although articulated vehicles represent just under 10 per cent of all goods vehicles, they are 40 per cent of vehicles over 5 tonnes unladen weight. In view of its topicality it is probably more inter-

esting to discuss gross vehicle weights here. Gross vehicle weight (GVW) is the weight of the vehicle plus the maximum load for which it is designed. In the case of articulated vehicles or trailers the weights of the trailer or semi-trailer are also included.<sup>5</sup> At time of writing the present limit is 32 tonnes but there are strong pressures to increase this to 38 tonnes or even higher depending upon the number of axles involved. Table 21 gives tonne-kilometres and total vehicle kilometres for rigid and articulated vehicles by GVW.

Table 21: Road transport activity by type of vehicle and gross vehicle weight, 1980

Gross Vehicle Wt.	Type of Vehicle				Total	
	Rigids		Articulated		tonne-kms.	vehicle-kms.
	tonne-kms.	vehicle-kms.	tonne-kms.	vehicle-kms.	tonne-kms.	vehicle-kms.
<12 tonnes	446.2	606.6	—	—	446.2	606.6
12–20 tonnes	662.6	197.9	39.2	10.9	701.5	208.8
20–28 tonnes	486.5	81.2	206.7	30.6	693.2	111.8
≥28 tonnes	541.8	60.2	2,627.7	265.4	3,169.5	325.7
<b>Total</b>	<b>2,136.7</b>	<b>945.9</b>	<b>2,873.8</b>	<b>307.1</b>	<b>5,010.5</b>	<b>1,253.0</b>

We have seen, already, the dominance of the heavier vehicles in terms of total tonne kilometres and here it is clear why the size limit of 32 tonnes GVW is under pressure (63 per cent of tonne-kilometres are done by vehicles in excess of 28 tonnes GVW). Equally, the dominance of the articulated vehicles in the heaviest class is evident from this table which shows that nearly 83 per cent of tonne kilometres, in the 28 tonne and more GVW class, is accounted for by articulated vehicles. As a whole, articulated vehicles account for 57 per cent of tonne kilometres and about one quarter of total vehicle-kilometres. The road engineers will, of course, be interested in a full picture of the performance of goods vehicles in the various classes of axle configuration, as the road damaging effects of heavy goods vehicles are highly dependent upon the weight distribution over the axles. Linked to this concern are, of course, the proposals by the EEC to re-structure the goods vehicle taxation system to reflect more directly the cost of providing roads, bridges, etc. capable of bearing their demands. We have not yet had the opportunity to examine the detail of the data possibilities by reference to sampling errors. However, the necessary tabulations will be produced in the near future and we have also in mind the pooling of data from two (or more) years surveys to boost the sample sizes and permit more reliable deductions to be made. It would be expected that the vehicle characteristics of interest here would be unlikely to show great variation from year to year. Without being too ambitious for the data quality, it is likely that the ongoing survey could be a useful basis for aggregate monitoring of the possible road damaging effects of heavy vehicles and the effectiveness of a re-structured taxation system which would be more directly linked to road damage (and presumably help policy makers in decisions on the allocation of realistic expenditures on road maintenance and building).

<sup>5</sup>To be precise “gross combination weight” and “gross train weight” are the terms used for articulated vehicles and rigid vehicles with a trailer.

## CONCLUSIONS

This paper, we hope, has given some much needed insight into the condition of the road freight transport sector for the year 1980. There are perhaps as many issues raised as there are, finally, clarified. It is hoped, however, that debate on matters of road freight transport policy will be substantially helped by these data. With the initiation of this survey, we have passed from a situation of having virtually no comprehensive road freight data to one where the concern must be to maximise the usefulness of what is a very full and flexible set of data. We have not dealt in any great detail with international road transport as the sample design does not yield many observations of "international vehicle-weeks". At present, work is progressing on the computer processing of administrative records of journeys carried out under international permits. It is hoped to link this with the present survey results to improve the possibilities of analysis of this relatively small but important sector of road freight transport.

It is clear to us that the wealth of data from the survey will form the basis of much additional research work, for example, the final topic dealt with offers scope for a combined statistical/engineering study of the impact of the goods fleet.

Finally, we would like to record some acknowledgements. First, to mention our indebtedness and that of the CSO to the respondents to the survey and to thank them for their continued participation in the ongoing exercise. The co-operation of the Department of the Environment, in facilitating access to the vehicle register, has been invaluable. We would also mention our colleague Mr. David Jennings who worked on the survey in 1980 and whose contribution, particularly to the computer system was immense.

## APPENDIX

Table A - Road freight transport activity by unladen weight, 1964 and 1980

<u>Unladen Weight</u>	<u>Tonnes</u>		<u>Vehicle kilometres</u>		<u>Tonne-kilometres</u>	
	<u>1964</u>	<u>1980</u>	<u>1964</u>	<u>1980</u>	<u>1964</u>	<u>1980</u>
			millions			
< 3 tonnes	8.4	6.5	337.3	469.1	224.3	235.6
3 - 5 tonnes	36.0	12.2	255.2	195.5	1,007.8	411.7
≥ 5 tonnes	11.0	83.8	77.9	588.4	482.5	4,363.2
<u>Total</u>	<u>55.5</u>	<u>102.5</u>	<u>670.4</u>	<u>1,253.0</u>	<u>1,714.6</u>	<u>5,010.5</u>

Table B - Road freight transport activity by business of owner 1964 and 1980

<u>Aggregate and Business of Owner</u>	<u>1964</u>	<u>1980</u>	<u>Ratio of 1980 to 1964</u>
MILLIONS			
<u>Tonnes carried</u>			
Transport			
licensed	10.9	20.6	} 2.36
other	*	5.1	
Industry	20.5	46.7	2.28
Other	24.1	30.1	1.25
<u>Total</u>	55.5	102.5	1.85
<hr/>			
<u>Vehicle kilometres</u>			
Transport			
licensed	67.2	197.2	} 3.38
other	*	29.9	
Industry	262.8	527.0	2.01
Other	340.3	498.9	1.47
<u>Total</u>	670.3	1,253.0	1.87
<hr/>			
<u>Tonne kilometres</u>			
Transport			
licensed	295.5	1,770.7	} 6.51
other	*	170.7	
Industry	739.6	1,875.8	2.54
Other	681.5	1,223.3	1.80
<u>Total</u>	1,714.6	5,010.5	2.92

\* not in 'transport' in 1964

Table C - Tonnage and number of loaded journeys by unladen weight, business of owner and type of journey, 1980

Type of journey and unladen weight	Business of Owner					
	<u>Transport</u>		<u>Other</u>		<u>Total</u>	
	tonnes	laden journeys	tonnes	laden journeys	tonnes	laden journeys
	(millions)					
End to end						
< 3 tonnes	0.0	0.0	3.4	4.7	3.4	4.8
3 - 5 tonnes	1.6	0.3	6.8	1.5	8.3	1.8
≥ 5 tonnes	22.0	1.5	50.0	3.9	72.0	5.4
<u>Total</u>	23.6	1.9	60.1	10.1	83.7	12.0
Split collection and delivery						
< 3 tonnes	0.0	0.0	3.1	2.6	3.1	2.6
3 - 5 tonnes	0.5	0.1	3.5	0.8	3.9	0.9
≥ 5 tonnes	1.6	0.1	10.2	1.0	11.8	1.1
<u>Total</u>	2.1	0.3	16.8	4.3	18.8	4.7

TABLE D - Tonnes carried by region of origin and destination

Origin	Destination										
	Dublin city & suburbs	Remainder of East	South East	South West	Mid-West	West	North West Donegal	North East	Midlands	Outside Ireland (Rep)	Total
<b>EAST</b>											
Dublin City and Suburbs	9.2	3.5	0.9	0.5	0.3	0.3	0.2	0.7	0.7	0.1	16.4
Remainder of EAST	3.2	6.8	0.8	0.3	0.2	0.1	0.1	0.6	0.6	0.1	12.7
SOUTH EAST	0.7	0.6	10.8	0.8	0.6	0.2	0.0	0.1	0.3	0.1	14.3
SOUTH-WEST	0.5	0.2	0.8	20.0	0.6	0.1	0.0	0.1	0.1	0.0	22.3
MID-WEST	0.1	0.1	0.5	0.8	7.5	0.2	0.0	0.0	0.1	0.0	9.4
WEST	0.1	0.0	0.1	0.0	0.2	6.0	0.1	0.0	0.4	0.0	7.0
NORTH WEST/DONEGAL	0.1	0.0	0.0	0.0	0.0	0.1	3.8	0.0	0.1	0.2	4.5
NORTH EAST	0.5	0.8	0.1	0.1	0.1	0.1	0.1	5.6	0.3	0.2	7.8
MIDLANDS	0.3	0.4	0.4	0.1	0.3	0.4	0.2	0.2	5.3	0.0	7.5
OUTSIDE IRELAND (REP)	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.6
<b>TOTAL</b>	<b>11.7</b>	<b>12.5</b>	<b>14.5</b>	<b>22.7</b>	<b>9.7</b>	<b>7.5</b>	<b>4.6</b>	<b>7.4</b>	<b>7.9</b>	<b>0.9</b>	<b>102.5</b>

Table E - Tonnage originating in each region by length of haul, 1980

<u>Region of origin</u>	<u>Length of haul</u>				Total
	0-9 km.	10-49 km.	50-149 km.	150+ km.	
	million of tonnes				
East	9.0	13.0	4.6	2.5	29.1
South-East	3.0	6.8	3.4	1.1	14.3
South-West	5.4	11.7	4.1	1.1	22.3
Mid-West	1.8	4.9	2.1	0.6	9.4
West	1.9	3.5	1.3	0.3	7.0
Nth. West/Donegal	1.2	2.2	0.8	0.3	4.5
North East	1.4	4.2	1.8	0.5	7.8
Midlands	1.6	3.9	1.6	0.3	7.5
<u>Total</u>	25.3	50.2	19.8	6.7	101.9

## DISCUSSION

*S. D. Barrett:* It is a great pleasure to propose the vote of thanks to the authors of this evening's paper. Among those interested in transport this vote of thanks will be repeated many times in the future because this paper meets an important need. The paper by their predecessor, Mr. J. J. Sexton, to this Society in 1967, held the stage for a decade and a half in discussions of road freight here. The numbers 83, 11, 6 which were the market shares in road freight in 1964 acquired an almost mystical significance since then. I hope that the numbers in this paper do not acquire such significance. This is not because of any disrespect to our authors tonight but because we all hope that this paper will not be the last word on the topic for another sixteen years. We need more data on Irish transport and faster availability of it to policy makers and the public.

The most direct link between tonight's paper and the 1964 survey lies in the projections of John Blackwell in his 1969 ESRI Paper, *Transport in the Developing Economy of Ireland*. Blackwell's prediction of the size of the internal market in 1980, based on correlations between macroeconomic data and freight volumes in the 1960s, imply a market of 4433 million tonne km. The actual volume found by Geoghegan and Brady was 4358 million. This is a remarkable degree of accuracy for an eleven year forecast. It shows also that transport has maintained its relationship with national output in Ireland over the past twenty years. There have been predictions that transport might decline as the share of the services sector in the economy grows. The railway share of the total freight market at 11 per cent in 1980 is also close to the share predicted in the Blackwell forecasts.



My response to the paper this evening deals with six aspects of it. I will deal in turn with its coverage, comparability of the paper's results and off-vehicle data, backloading, liberalisation, vehicle weights and some statistical points.

*Coverage:* There may be a problem of definition in relation to the title of the paper this evening. The paper does not in fact cover Road Freight transport in Ireland as the title states. Indeed Page 8 notes that "we have included journeys which originated or terminated outside the State in the analyses. Since we are mainly concerned with the performance of the Irish road transport fleet it was considered desirable to follow this treatment".

The output of Irish based transport differs from the output of transport in Ireland where the latter includes vehicles registered outside the State. These work within the State but are not included in the survey. In the cross-border haulage market, the Department of Transport data indicate that 75 per cent is held by Northern Ireland hauliers. In the case of overseas haulage of meat, the Transport Consultative Commission estimated that the Irish share was 58 per cent.

The question of coverage means that we must look at excluded categories of vehicles. The categories excluded from the 1964 survey were government owned vehicles, agricultural tractors and dumpers. The government owned vehicles, not covered, include the fleet owned by the Department of Post and Telegraphs. The Post Office fleet has 3600 vehicles. The Postal service income in 1981 was £89m. and investment in the phone services was £221m. This is by any standards a sizeable industry, much of it transport oriented. The vehicle km of the other exempted categories were 823 million km in 1980.

At this point we would summarise by saying that haulage within the country, by hauliers based elsewhere and by vehicles not covered in the survey, may contribute to divergences between the coverage which might be assumed from the title of this paper and the transport actually covered. A further source of divergence may be when the categories of vehicle are identical but the information collected in the census may differ from that covered by other systems of data collection.

*Comparability of Census and Off-Vehicle Data:* The data from the Paper differ from those based on off-vehicle records. Part of this divergence may be due to the greater coverage of the off-vehicle counts. These cover all vehicles, whereas the census we are examining tonight does not cover Northern Irish, overseas, excluded and exempted, vehicles. There may also be some divergence due to under-reporting. This problem occurs in the Household Budget Survey where reported consumption of some commodities is known to be understated. Measures have been taken to deal with this problem in the Household Budget Survey and they may be needed in the transport case also.

In Table 1 we show the diverging results from "Book in the Cab" and off-vehicle counts. The divergences are large and merit some reconciliation of the numbers. Some hypotheses that might be examined might be as follows: "Roadside vehicle checks will have higher empty running than recorded in 'book in the cab' surveys"; "Mileage will be under-reported in the book in the cab studies"; "Average journey length will be greater from an off-vehicle count than that reported in a book in the cab study". The case for these hypotheses would be that it is easier to declare a vehicle empty, in the hope of avoiding further questions, than for reasons ranging from tacographs to taxation and output: thus, income will be under-reported in transport, and that this under-reporting will shorten average journey length.

*Backloading:* The section of the paper entitled Road Freight transport by Business of Owner states that: "some firms, whose main activity is recorded as not in haulage, are

Table 1: *Comparison of Owner Supplied and Off Vehicle Estimates of Road*

	<i>Freight Volumes 1978-80</i>			
	<i>G-B*</i>	<i>RFTLH*</i>	<i>AFF*</i>	<i>DOE*</i>
Vkm (millions)	1253	943	2032±165	773.1
Empty Running %	35.4			46
Ave. Haul (km)	48.53			109.12

\*G-B: Geoghegan-Brady paper. RFTLH: "Road freight transport by licensed hauliers series" (CSO). AFF: An Foras Forbartha: "Vehicle Kilometres of Travel 1980". DOE: G. D. McIlraith: "Patterns of Truck Operations and Travel in Ireland", August-September 1979.

Table 2: *Empty Running of the Goods Vehicle Fleet, 1964-80 (%)*

		Index
SSRF (1964)	31.3%	100.0
G-B (1980)	35.4%	113.1

holders of road freight merchandise licences" and that this sector accounts for 2.3 per cent of all tonne-kms.

This is the first published figure on backloading in Ireland. The UK data on backloading, from Bayliss in 1971 and Cooper in 1978, refer to backloading as a proportion of own account and were respectively 2 per cent and 2.7 per cent. Adjusting the British data to the share of hired haulage there we estimate that backloading is relatively 2.5 times more important in Ireland than in Britain, when compared to hired haulage. Ireland has 2.3 per cent backloading and 32 per cent hired haulage. Britain has 1.1 per cent backloading and 61 per cent hired haulage. The Andersen Report showed that firms with over 500 employees in Ireland had an average of 23 vehicles while the average hired haulage fleet is only 2.5. There may then be greater transport expertise in the own account sector than in hired haulage, because of the way in which our licensing system has evolved.

The legal distinction between hired haulage and backloading by own account operators means little in economic terms. It is important however that a legal obstacle to more efficient use of the national transport fleet should not hinder efficiency. Table 2 shows that empty running has increased from 31.3 per cent of kilometres run to 35.4 per cent between 1964 and 1980. Any package of liberalisation must include the removal of the ban on backloading.

*Liberalisation:* The paper notes that: "in the case of each measure of output there has been a shift towards professional transport" and that: "there have been a number of developments since 1964 which have encouraged the professional haulage sector. Legislation has had the effect of liberalising the road transport market in some respects."

One must also point out however the very slow pace of liberalisation. In 1964 the hired haulage share was 17 per cent. Table 13 shows that by 1980 this had increased to 32 per cent compared to an average of the other countries, excluding Luxembourg, of 58 per cent.

Liberalisation in Ireland has some distance to go and the pace seems to be slowing down. The Report of the Transport Consultative Commission on Road freight Haulage in July 1981 that the timetable for completing the process of liberalisation should "immediately commence drafting of legislation to amend the Road Transport

Acts to complete the process of liberalisation". The timetable provided for full liberalisation by July 1983 with Road freight Carriers licences available to all suitably qualified operators, including own account operators, and that short-term rental facilities would be permitted nationwide. The two years have almost expired and there is no likelihood that the timetable will be met.

The failure to complete liberalisation is a self-imposed cost on the Irish economy. We have in recent times become more conscious of the harm which such inefficiencies in the sheltered sector can impose on the vital traded goods sector of the economy, in areas such as electricity, phone and postal charges and we should also move to remove barriers to efficiency in internal goods transport.

In 1976 we were on the brink of liberalisation. The 1978 legislation was a step back in itself and crucial sections were not implemented. Section 6 which provided for the extension of exempted areas by 5 miles around the main cities was not implemented. Section 9 of the Road Transport Act, 1978 allowed own account operators to lease or rent vehicles from holders of merchandise licences, under an agreement containing requirements approved by the Minister for Transport. This action proved impractical.

It is hardly necessary to quote for this audience the findings of Bayliss, Foster, and Geddes on the gains in Britain from road freight liberalisation, a policy carried out under both Labour and Conservative administrations. It is to be expected that those with licences do not want any new people allowed into the business, but the power of less than 800 licence holders to delay liberalisation, a policy announced back in 1970, speaks volumes about the way in which our economy is managed. Liberalisation should be completed immediately and the lost timetable of the Transport Consultative Commission made up.

*Axle-Weights:* The data in Appendix A of tonight's paper show a "polo-mint effect" in the goods vehicle fleet. While vehicles under 3 tonnes worked as much in 1980 as in 1964 and the heavier vehicles worked harder, the 3 to 5 tons class reduced the km performed per vehicle from 30,000 to 18,000 and their tonne km from 122,000 to 37,000. A similar development took place in Britain but there the number of vehicles in this class fell from 288,000 to 119,000 between 1967 and 1978. The British fall of 59 per cent in this vehicle class contrasts with our increase of 4.5 per cent between 1964 and 1980. Using a 45 per cent more vehicles to do only 30 per cent of the tonne kms per vehicle in 1964 offers us another pointer to the low rate of return on investment in the Irish economy as a whole.

The second aspect of this evening's paper concerning vehicle weights refers to the heavy vehicle. The paper notes the "dominance of the heavier vehicles in terms of total tonne kilometres" and states that: "it is clear why the size limit of 32 tonnes GVW is under pressure (63 per cent of tonne-kilometres are done by vehicles in excess of 28 tonnes GVW)".

Statutory Instrument 119 of 1983 raises the maximum laden weight permitted for rigid vehicles with three axles from 22 to 24 tonnes and from 25 to 30 tonnes for four axles. Greater weights for articulated vehicles are also permitted where longer axle spacings are used and the limit of 32 tonnes is not exceeded. Further regulations to provide for increasing the permitted weight for 5 axled articulated vehicles from 32 tons to 38 metric tonnes are to be introduced at an early date.

The estimates supplied to the Armitage Committee by the TRRL indicate that savings of between 5 and 9 per cent would accrue to the operators of 38 tonnes 5 axle vehicles, compared to the 32.5 tonne 4 axle class. The savings to the British economy are estimated at £150m. a year. Some 42,000 vehicles would be affected. Pro rate savings in Ireland would be about £7m.

With the right vehicle configuration there need not be a countervailing increase in road track costs. Data taken from Ken Button's studies show that: at 24 tonnes GVW, the revenue to cost ratio for road track costs is 0.96 for three axles rigid; 1.36 for 4 axles rigid; 1.02 for 3 axles artic and 1.52 for 4 axles artic. The GVW alone is not a good guide to estimating the damage done by the heavy goods vehicle to roads.

*Some Statistical Points:* We regret that the definitions of regions used are so different in 1980 from the 1964 versions and that only in the case of Cork and Kerry can comparisons be made. Perhaps, if the 1964 data could be re-classified by regions a "once-off" comparison might be made in a future edition of the series.

The post stratification to allow for differing response rates in the hire and reward should be expanded on in the text. Both the 1964 survey and the regular series published by the CSO on hired haulage since then show that: that km per vehicle differences between railway companies and other hauliers were 24 per cent in 1964 and 118 per cent in 1978. The tonnage difference was smaller at 15 per cent and 23 per cent respectively.

We note also that the statistical definition of "split delivery and collection" and "end to end" journeys is such as to make all the former, loaded trips. Return trips to base from delivery and collection were re-classified as end to end journeys. We feel that the entire base to base trip should be used in calculating what proportion of a split delivery and collection trip is loaded.

These small points on suggested changes in future works in this area are offered here as refinements to a study which has already met a great need. We have little idea of the volumes of activity of Northern Irish and overseas hauliers here, or of the exempted and excluded vehicles. We look forward to work on the differences between outputs reported in transport and observed in off-vehicle counts. The paper tonight has given us new insights on backloading and appears to have already influenced thinking on vehicle sizes. We hope that it can also break the log jam on the timetable to complete liberalisation proposed by the Transport Consultative Commission. It is again a pleasure to propose the vote of thanks.

*J. Short:* Let me first say how pleased I am to be able to second the vote of thanks to Brian Geoghegan and Gerry Brady for their very interesting and useful paper.

I think it is true to say that the data from the Road Freight Survey can make a valuable quantitative input to almost every aspect of freight transport policy. The first stage of this process is the dissemination of the information that has been collected and this paper makes a significant contribution in this area. Additionally the presentation of the results in this forum will help publicise the fact that there is now reasonably up-to-date quantitative information available on freight transport. We look forward to the speedy publication of the detailed report for 1980 and also to the summary data from the ongoing survey.

Setting the results in the context of data from other sources reveals some interesting features. As has been mentioned the Foras Forbartha annual series on goods vehicle milage (which has, unfortunately, been discontinued) indicates a large discrepancy which cannot easily be explained. Comparisons for the licensed haulage sector with the data from the annual survey of licensed hauliers seem to confirm the impression that this long-standing series is understating activity by licensed hauliers. The annual survey of licensed hauliers provides useful information on aspects of haulage operations not covered by the present survey and it might be worth investigation whether more refined procedures are possible in that survey to keep the main aggregates in line with totals from the road freight survey.

The comparison with the annual Department of Environment (DOE) Census is a fascinating one. One point that emerges very clearly is that we are uncertain of how many Irish goods vehicles have been operating on our roads in recent years. For example there were 91,000 vehicles on the DOE register in total in September 1980 although only 64,000 were licensed at the time. It is clear that the annual Census understates the true position, but the extent to which this understatement has changed over time is unknown. (A similar though more pronounced trend is occurring for motor cars, to which the 70,000 drop in the car registration figures for 1982 testifies). All commentators to date have used the annual Census figures from the Department of the Environment in constructing models, or in making projections of fleet capacity or numbers. Such projections must now be open to question, as it is possible that the annual DOE series does not provide even an accurate trend, since the tendency to delay payment of tax on goods vehicles may be greater than in the past. This certainly is a topic that merits further examination.

One of the most important aspects of the survey is its clarification of the 'own account' and 'hired haulier' concepts. It is crucial to realise that the market share held by own account operators depends on the measure being used. For example, own account operators had 92 per cent of the vehicles, 75 per cent of the tonnes and 62 per cent of the tonne kms. The latter figure is the one that is conventionally used and is significantly lower than estimates made by various commentators over the past few years.

One technical aspect of the survey, that I found interesting, was the wide discrepancy in sampling fractions in the different vehicle weight categories. These were similar to those used in 1964 and provide estimates with relatively large standard errors for the smaller vehicles. In fact, the estimate of vehicle mileage for vehicles of less than 3 tonnes at only 107 miles per week seems somewhat low. Certainly available costing tables for freight operators do not use such low mileage. Since the vehicle numbers are also estimated and since the vast majority of vehicles are in the smaller size classes, does this not mean that the vehicle number estimates, themselves, are subject to quite a high degree of variability? Another technical point of some interest is how well the survey can measure changes over time. For example, how seriously can quarter-to-quarter changes in the broad aggregates be taken? If the survey is not particularly good at estimating short-term changes, then perhaps it would be best to go for large scale surveys, say every 5 years, which could include extra information on financial or operational topics.

An important issue in the context of policy is how well available freight capacity is being used. The estimate of empty running at 35 per cent of total mileage is higher than in 1964 and higher than in Britain. However, empty running, by itself, is only one dimension to the question of whether capacity is being used efficiently. More refined measures are needed to measure the extent to which capacity is being used, remembering that for many commodities the constraints are in volume rather than in weight terms. Perhaps there are questions that can be asked in future surveys which would determine whether a full load was carried in terms of available volume capacity. The data from such questions would help provide more comprehensive data on vehicle utilisation, which in turn would assist a balanced assessment on policy issues relating to the introduction of larger vehicles and on the maintenance of a balance between supply and demand.

The major policy issue at present is that of the liberalisation of the road freight transport industry. The report of the Transport Consultative Commission, recommending a more liberal system, has been awaiting decision since July 1981. At this stage it is likely that both proponents and opponents of the liberalisation recommendations will find

aspects of the data from this survey to suit their particular beliefs. A full assessment will have to await more detailed analysis. In any case, the Transport Consultative Commission decided to go ahead with their report without Road Freight Survey data. As a result the report's recommendations were based rather on a belief that liberalisation was the correct approach, then on a detailed analysis of the behaviour of different kinds of haulier. It would be counter to the spirit in which the TCC made its report to further delay decisions.

I would just like to conclude by thanking the authors for their very interesting paper and I have great pleasure in formally seconding the vote of thanks.

*J. Markham:* As one who has laboured in the absence of such information I am pleased to welcome the recently published CSO results on the 1980 Road Freight Survey and to congratulate Mr. Geoghegan and Mr. Brady on their paper. Both authors are aware that CIE contributed to and supported this work, both at the design and survey phases. A number of CIE's fleet appear in the sample each week and our Freight Division have been co-ordinating the responses and forwarding the completed forms to the C.S.O. We agree with the authors when they call for additional work on passenger transport. Very little is known about non-CIE passenger transport. We also agree with the call for a symposium on all types of freight i.e. air, sea, road and rail.

The results help to confirm the CIE view that the railway's share of that market in which it competes (i.e. the inter-urban market) is around 30 per cent. This confirms the importance of the railway in keeping heavy traffic off our main inter-urban road system. In fact looking at Table D, we see that three quarters of tonnes moved is intra-regional which by and large is traffic that the railway is not competing for. CIE's (rail and road) share of the overall market stood at 14 per cent in 1980. The professional haulage industry now hauls 46 per cent of the overall market (5,700 million tonne kilometres) and CIE's (rail and road) share of this sector (2,600 million tonne kilometres) is 31 per cent.

The survey confirms that CIE's estimate (4,740 million tonne kilometres) of the freight market in 1979 was in line with the real situation and that McKinsey considerably over-estimated the situation at 7,700 million tonne kilometre for 'rural lorry' movements. McKinsey estimated a 20 per cent share for the railway in the National Primary Road and Rail market compared to CIE's own estimate of 27 per cent.

The often quoted figure of 82 per cent own account for 1964 is grossly misleading. The correct percentages are 69 per cent in 1964 and 54 per cent for 1980 based on the total market i.e. rail and road. We feel that the Road Freight Transport by Licensed Hauliers series (*Irish Statistical Bulletin* — annual series) should be discontinued. CIE contributes accurately to this series but one gets the impression that it is not filled in very accurately by other hauliers. Data from this series has been used to draw misleading conclusions about CIE in the past.

I have always felt that individual trips should be separately identified by the respondents as either for "hire and reward" or "own account" and I would welcome present views on this aspect. There is a good deal of talk about liberalisation and one wonders in a sense why there is need for it as operators are breaking the rules all over the place. The level of empty running has increased since 1964 and maybe liberalisation is working in the wrong direction.

Finally, in again congratulating the authors, I would mention that data on energy usage will be welcome in course.

*T. Ferris:* I would like to join other speakers in congratulating Brian Geoghegan and Gerard Brady on the excellent paper they presented to us here this evening.

There are just three brief points which I would like to make. First the authors suggest in their paper that the comparison of aggregates, such as tonne kilometres, tonnes and vehicle kilometres, in 1964 and 1980 “may slightly overstate growth”. There is certainly evidence to support this conclusion. For example, between 1964 and 1980, Gross Domestic Product grew in real terms by 3.9 per cent per annum, that is, after adjusting for inflation. However, road freight transport, as measured by tonne-kilometres, grew at a much faster pace than overall economic activity. Tonne kilometres grew at an average annual rate of 6.9 per cent over the sixteen year period, which is nearly twice the growth rate of GDP.

Second, I would like to refer to projections of ton-mileage prepared back in 1969 by John Blackwell, as published in ESRI Paper No. 47. We have heard Dr. Sean Barrett refer to one such projection: he would appear to have used Blackwell’s Equation 2:1 which is based on GDP at constant (1958) factor cost. Yet Blackwell in his ESRI paper favours Equation 2.2 based on “GDP at constant (1958) factor cost plus imports at 1958 prices”. He states in his paper that “of these equations, 2.2 seems to be the most satisfactory”. For interest I derived 1980 values for both GDP and imports, at 1958 prices, to test the equation. The result is a projection of 4,631 million tonne-kilometres for 1980. By comparison, a lower-bound estimate of 3,864.2 million tonne-kms was computed by Geoghegan/Brady for 1980. Again this would seem to lend support to the authors conclusion that the comparison of aggregates such as tonne kilometres, tonnes and vehicle kilometres, as between 1964 and 1980, may slightly overstate growth.

Finally, I would like to raise a point about “external journeys” covered by freight surveys. It is my understanding that the 1964 Sample Survey of Road Freight Transport, like the present 1980 Survey, included journeys partly outside the State; although such journeys would have been less significant in the 1964 Survey than in the 1980 Survey. I would like the authors to comment on this interpretation. The only reason I raise this point is to confirm that the aggregates compared are, in fact, “like-with-like”.

In conclusion, I would again like to congratulate the authors on their paper.