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**DEVELOPMENT OF PRICE AND QUANTITY INDICES IN TRANSPORT**

Transmitted by the Government of the United Kingdom

Note: In relation to the Working Party's discussion about the development of price and quantity indices in transport during its fifty-second session, the United Kingdom has provided the attached information which outlines the methodology for setting up consumer price indices in transport. The present document is submitted for consideration by the Working Party.

\* \* \*

**UK OFFICE FOR NATIONAL STATISTICS**

**PRICE INDEX FOR**  
**FREIGHT TRANSPORT BY ROAD**

**AS DEVELOPED FOR USE IN THE CORPORATE SERVICES PRICE INDEX**

**PRODUCED BY THE UK OFFICE FOR NATIONAL STATISTICS**

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## **I** **Summary**

The efficient transport of goods is a fundamental requirement of any modern economy and, in the case of the UK, road haulage is by far the most important element of the freight transport sector. The volume of goods moved by road is about ten times greater than that moved by rail, the second most important, and this volume continues to grow – albeit at a slower rate than in the past with the switch in the manufacturing sector away from heavy engineering products.

For that reason, the Office for National Statistics (ONS) considered it was important enough for a price index to be produced as part of the Producer Price Index (PPI) in 1991, even though it is a service. Its early development and the regular index compilation was done in line with the then current UK PPI practices. It was not until a separate and independent Corporate Services Prices Index (CSPI) team was formed in 1995 that responsibility for the freight transport by road index was transferred to the new team and it became a part of the first published CSPI series.

A small amount of work to upgrade the quality of the data and the robustness of the index was done in 1995, when the series was last rebased. However, an opportunity to review thoroughly the price index for this industry has not presented itself until recently. Work is now in hand to quality assure all of the basic development criteria, both through the standard review process and the exercise to rebase the CSPI series on 2000=100, and that also offers the opportunity to make some changes which have already been identified which will strengthen the quality of the index.

## **II** **Introduction**

The paper draws from information provided by different agencies and sources, as well as providing an insight into the processes and procedures adopted by CSPI. In addition, supporting papers have been supplied by Australia, the Netherlands, New Zealand, the USA and Japan.

Information on the background to the industry and the formulation of the present UK CSPI series is outlined within each of the following sections:

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### **III Definition of Industry Outputs/Types of Services**

#### **A. Industry outputs/what is being priced**

The output relates to the services provided by those UK enterprises classified on the Inter-Departmental Business Register (IDBR) to the activity of freight transport by road (sub-class 60.24/9 in the UK Standard Industrial Classification of Economic Activities 1992 – [SIC 92]). It excludes the following:

- all similar services performed by enterprises where the major activity is classified elsewhere in the transport sector, such as freight forwarding or storage and distribution;
- freight transport where it is performed as an ancillary activity undertaken by enterprises classified to the manufacturing, extraction, construction, wholesale distribution and retailing sectors (still a very significant part of the total UK freight transport activity); and,
- any consumer-related activity, primarily for the removal of furniture and other domestic goods (classified to SIC 60.24/1).

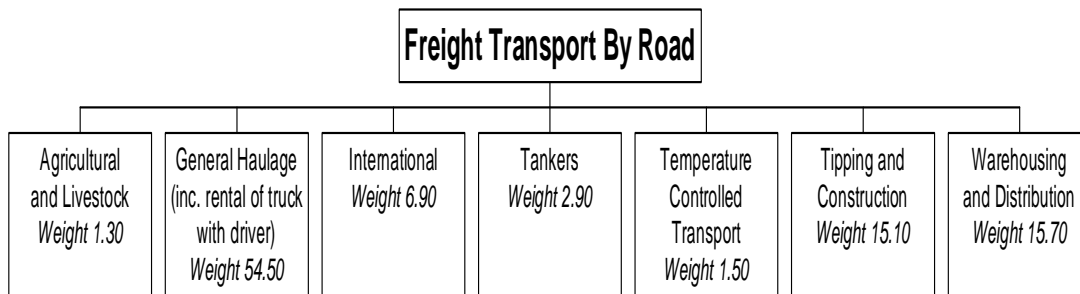
The cost of these services is measured in terms of actual and specific contracts for the movement of goods, both within the UK and internationally. The data suppliers are asked to supply prices which they consider to be typical and representative of their business and, importantly, should be based on repeating contracts wherever possible. It

is recognised that there is a potential weakness in the current index as a large element of the overall market may not be fully represented, namely the one-off or spot market, where the service relates to a single journey which is unlikely to be repeated.

## B. Types of services

The scope of the various services provided by data suppliers is illustrated in the diagram below:

**Fig.1 Industry Structure for Freight Transport by Road as used by CSPI in the current series, (1995=100).**



(This diagram is sometimes known as “the family tree”.)

The decision to categorise the various branches as a mixture of activity, vehicle and/or cargo types was made after consultation with representatives from the primary industry trade association and other industry experts.

It should be noted that the “international” category covers a range of different road freight activity. The other categories are all for transport within the UK.

The inclusion of warehousing and distribution was a contentious issue at the outset as, going strictly by the classification rules, this activity is not part of SIC 60.24/9 but has its own classification, SIC 63.12, as a separate and self-contained auxiliary transport activity. However, the advice of the industry experts supported its inclusion here too, when undertaken by enterprises classified to freight transport by road, as it is a rapidly growing, and often indistinguishable element of the total package of services provided by the industry. This theme of diversification and integration of other transport and transport-related activities, and the issues arising, is covered later in this paper.

The other activity within the illustrated industry structure which differs from other categories is the all-embracing “international” classification. This was also considered to be sufficiently important to stand in its own right. The UK’s geographical location with its relative proximity to the continental mainland and Ireland, means that the benefits of door-to-door delivery, essentially via one mode of transport, can be maximised.

Cargoes and vehicles stay together and are transported via regular and frequent ferry services to numerous continental ports; this eliminates the need for the delivery of these goods to be dependent on less frequent shipping schedules, with the attendant cargo

handling/storage requirement. The advent of the channel tunnel between the UK and France and the freight opportunities it offers has added another dimension to the international freight sector.

Many UK freight hauliers now have depots and storage facilities in, or in close proximity to, ferry terminals and the tunnel and specialise in this particular market. As a result it has become an increasingly important part of the overall activity.

In an ideal situation, CSPI would expect all of the following characteristics to be recorded in the description of freight services for which prices are collected:

- size and type of vehicle;
- nature and weight of cargo;
- distance of journey and/or destination;
- time criteria for delivery, if applicable;
- name of client or customer; and,
- any other special conditions which might apply to the contract.

However, it was accepted at an early stage that it could place an unreasonable, and unwelcome, burden on data suppliers to provide that level of detail in every case. Therefore, CSPI tends to adopt a more pragmatic approach and is prepared to accept descriptions of freight services which are in line with the normal business practice of the enterprise - subject to the important proviso that the data supplier is able to identify the specific contract and can supply the latest (and correct) price for that service on a regular, repeating basis.

## **IV Business Model**

### **A. Nature of the Industry**

The efficient distribution of goods is one of the defining parameters of economic development, critical to the security of supply for the basic essentials of life. It also helps to define market diversity and consumer choice, thus driving competitiveness, jobs and prosperity. This is particularly the case for the UK, with an economy which is heavily dependent on exports, in addition to the need for an effective domestic distribution infrastructure based on a comprehensive, modern highway system. It is a very important factor in overall business costs, typically accounting for between 5 and 10% (and considerably more in the heavy industrial sectors). Freight transport by road is therefore critical to the effective and efficient operation of the vast majority of manufacturing enterprises.

Since the 1960s, with the extensive downsizing of the rail network in terms of track miles and the attendant reduction in its freight carrying capacity, dependence on distribution of goods by road has steadily increased and many places within the country are now only accessible by road. It is not surprising, therefore, that the most dominant form of

transportation continues to be road freight. Latest figures suggest that the volume of road freight is ten times greater than that carried by rail.

The level of activity in the freight industry is closely linked to the health of the economy and it suffered in the economic downturn at the start of the 1990s, although it has recovered substantially since then. Latest industry estimates show that around 1,700 million tonnes of goods are carried annually by road. This high volume is being maintained, despite significant changes in the nature of the UK's manufacturing sector with the decline of heavier engineering industries and the trend towards lighter types of products.

The food and drink sector is one of the largest areas of activity for road hauliers (in 2000 it accounted for an estimated 21% of total volume) as there is little in the way of competition, particularly for fresh, perishable produce. Other key sectors served include crude minerals (18% of total volume) and building materials (10%). Rail continues to dominate the transport of bulk, heavy goods such as coal and iron and steel. In the chemicals and petroleum sector, road transport faces strong competition from pipeline services and it accounts for a relatively low 7% of overall road freight volume.

Because of the compact geographical nature of the UK and the relatively short distances between major centres of population, air transport has not yet made a significant impact on the domestic freight market, although its importance is steadily growing. It holds some advantages in certain sectors, however, such as high value, low weight, time-critical products – from the electronics industry, for example – and tends to concentrate on those areas. The importance of air freight is centred on the export market and it continues to be strong in that area.

Although in-house transport services are still an important element in the overall picture of the road freight industry in the UK, third party contractors make the most substantial contribution to the industry. Government data show these operators accounted for 65% of volume and 75% of goods moved in 2000, up from 62% and 74% respectively in 1996. Independent road hauliers account for the ownership of more than 80% of all road freight vehicles over 35 tonnes.

## **B. Industry Organization**

Traditionally, activities of enterprises engaged in road haulage were focused on simply providing the physical means of transporting goods from point A to point B, with a small minority having an ancillary, but less important, interest in providing storage and warehousing facilities for goods in transit. As a result, the task of isolating and collecting data for the total activity of contracted road freight services was relatively straightforward with the vast majority of enterprises in scope being classified to SIC 60.24/9. However, in the past 15 years or so the picture has changed radically and it is now a much more complicated process to ensure prices data used in the compilation of the CSPI are truly representative of the entire UK road freight industry.

Although the volume of road freight business has remained buoyant in recent times, competition in the industry has sharply increased and, in some sectors, it is now a story of too many road hauliers competing for too little business. Many of the largest enterprises have opted to concentrate on specialist niche markets or destinations (such as some of those serving European destinations) and have also diversified in order to offer clients a wider range of specialist, transport-related services. Indeed, many enterprises now describe their activity as the provision of freight logistics, designing and implementing supply chain management. This can often cover the movement of people, services and information, as well as goods.

In these cases, the actual transport of goods may no longer be the primary activity as logistics companies can offer clients a complete and over-arching range of freight-related services, tailored to suit the needs of each specific client. These services may include some or all of the following:

- freight forwarding;
- cargo consolidation, management and handling;
- stock control and re-ordering;
- dealing with documentation;
- storage and warehousing;
- information management services, e.g. operating web sites linking loads to hauliers and the increased use of Electronic Data Interchange (EDI);
- courier services;
- negotiating return loads for clients' own transport;
- transport consultancy services.

Some have gone even further and moved upstream into the specialised fields of packaging, crating, palletising and containerisation of goods, and even into the fields of plant hire and vehicle recovery, repair and maintenance. In addition, increased access to, and use of, the internet has led to the establishment of global partnership networks, - linking international logistics companies, hauliers, shipping and railroad operators - which can arrange and undertake all freight services for goods destined for any part of the world under a single, integrated contract.

Such diversification and increased sophistication has tended to leave the smaller independent operators behind in terms of development of their business activities and they are left, in the main, dealing with regular, contractual work for a limited number of clients, serving a specialised market, bidding for spot-contract or one-off loads, or concentrating on distribution within a defined geographical region. From the point of view of the CSPI, this trend towards diversification has created an attendant problem, namely the potential for reclassification of the activities of some major enterprises out of the road freight industry, where this is no longer the largest single activity.

Despite these radical changes and stiffer competition for business (which has seen the loss of many small businesses), the smaller hauliers continue to dominate the industry in terms of numbers. Industry sources indicate that 87% of operators have 5 vehicles or





The industry itself is striving to rationalise and streamline its operations. There has been a growth in the development of large-scale regional distribution centres. These serve local networks and help to maximise load capacities and promote the use of smaller vehicles for specific customer deliveries. This growth is seen in sectors such as food and electrical goods and appliances, but the principle is spreading to other areas of the market.

In a similar vein, there is a gradual growth in the use of intermodal transport systems, making the best use of road, rail and sea links. The aim is to reduce the total road miles in the supply chain to the minimum possible and to maximise the superior bulk carrying capacity of the rail network.

The Government has also helped the industry by increasing the allowable maximum vehicle size to 44 tonnes with effect from February, 2001. This measure alone, if fully implemented by the fleet operators, could have the potential of reducing operating costs by 8% - a significant saving for any business in the current competitive climate. Continuous improvements to vehicle and engine design are also helping, particularly the drive towards more fuel-efficient and leaner burning diesel engines – a key factor in the environmental context also.

The industry is not being overly optimistic about the future, however, and there is concern about the impact of some of the Government's proposals contained in its Integrated Transport Policy. Amongst others, the possibility of congestion charging is seen as being a very serious issue for road freight operators as well as the proposal to double the present amount of freight carried by rail. There is also concern that planned improvements to the road infrastructure will fail to keep pace with the increase in traffic volume.

### **C. Government Legislation**

A whole raft of legislation and regulations controls the establishment, conduct and operation of enterprises engaged in the road haulage industry in the UK, as well as provisions governing the vehicles used and drivers employed. These controls are imposed under EU and national legislation (various transport and traffic acts), as well as limitations or restrictions in relation to highway access, hours of operation, etc. which might be imposed by various local authorities.

Some examples are:

- Road freight enterprises must have operator licences for all vehicles over 3.5 tonnes (issued, regulated and monitored by the area Traffic Commissioners of the Department for Transport) and must pay regular fees for the operation of these vehicles. The system is designed to ensure the probity, professional skills and ability and the financial security of businesses in the industry and helps to identify and eliminate any potential "cowboy" operators. There are three levels: a Restricted Licence allows an operator to only carry their own goods; a Standard National

Licence, allowing the carriage of own goods and those of others in Great Britain; a Standard International Licence, allowing the operator to carry goods within GB and abroad.

- There are strict regulations governing the construction and use of goods vehicles and their safety and maintenance (subject to stringent annual tests and spot checks by the Vehicle Inspectorate and the police). Special rates of Vehicle Excise Duty apply to goods vehicles.
- Environmental considerations are safeguarded through regulations on the safe transport of hazardous and dangerous materials, for example.
- Driving skills and standards are strictly governed and monitored – there are approved training schemes and drivers must hold a special goods vehicle licence, and their conditions of employment and working conditions are tightly governed (the Working Time Directive, for example). Working hours, vehicle speeds and driving controls are automatically monitored through tachographs fitted to every heavy goods vehicle.
- In addition, there are the usual standards of road safety and driving care and attention which must be observed.

#### **D. Public Ownership and Subsidisation**

Since the privatisation of the National Freight Corporation in the early 1980s, the industry has been totally de-regulated and operates fully within the private sector; there is no public ownership or subsidisation of its activities.

### **V Sample Design**

The index for freight transport by road is one of the most established of those included in the current CSPI published series. Its origins go back as far as 1991 when it was originally a component part of the Producer Prices Index (PPI). It became part of the separate and independent CSPI series in 1995. The current sample is a panel which has been in place for over 5 years. There are now plans in place to enhance this panel and to rotate some of the smaller businesses out of the sample.

In keeping with normal CSPI practice, data suppliers are asked to provide details of services which are typical and representative of their business and can be re-priced on a regular, quarterly basis. The original sample of contributors on which the current index is based (for the 1995=100 series) was stratified by employment size. The period up to the start of 2002 saw a significant reduction in the number of data suppliers. Selected enterprises have either ceased to operate or could not continue supplying prices for the original specified service through cessation of the contract (and were unable to furnish a valid, substitute specification).

The structure of the sample and how it has changed between 1995 and 2002 can be seen in the following table:

**Table 2** **Structure of CSPI Sample**  
(based on employment sizebands)

<b>Employees</b>	<b>Total no. of units</b>	<b>No. in sample 1995</b>	<b>No. in sample 2002</b>
<b>0-9</b>	30,070	28	2
<b>10-19</b>	2,022	10	6
<b>20-49</b>	1,140	30	27
<b>50-99</b>	322	16	13
<b>100-299</b>	139	15	11
<b>300-499</b>	23	5	5
<b>500+</b>	31	15	13
<b>TOTAL</b>	33,747	119	77

One further factor here is that current administrative rules (introduced in the mid-1990s) preclude the smallest businesses, those in the 0-9 category, from inclusion in the sampling frames used for ONS business surveys. The loss of 26 units in that sizeband with no option for replacement accounts for a significant proportion of the overall decline. Some attempt was made to find replacements in the next higher sizeband when the series was last rebased in 1995, but without a great deal of success.

The current live sample of 77 contributors supply prices for more than 180 items.

## **VI Industry Record-keeping Practices**

For this industry, the CSPI seeks prices for actual and tangible services and, for the most part, the required data are readily available and can be quickly extracted from the normal financial accounting and records systems used by the contributing enterprises. This pricing mechanism tends to be one of the more reliable of all those within the scope of the CSPI in terms of continuity and quality, but there are occasional problems when the original priced service ceases and a comparable substitute cannot be provided by the data supplier.

## **VII Publication Structure and Relationship to CPC**

The index is published at the top level for the freight transport by road industry in its entirety, together with a separate component series for the important "international" element, although the latter is not separately classified in the UK's SIC 92. All of the activity which is in scope as far as the CSPI is concerned is contained within a single subclass, SIC 60.24/9 – Freight transport by road not elsewhere classified. The relevant United Nations Central Product Classifications (CPCs) are 6423, 6424 and 6425 (with the exception of 64235, the transportation of furniture [SIC 60.24/1] – which is not covered by the CSPI). The equivalent ISIC references are 6023 and 6412.

## **VIII Pricing Methodology**

This is one of the more straightforward industries in the CSPI series as far as pricing methodology is concerned. Contributors provide details of actual transactions performed for real clients (or for regular routes serving a number of clients with similar requirements and cargoes). These services are deemed to be typical and representative of the activities of the enterprise providing the data. At the time of recruitment, the contributors are asked to provide the initial price (base price) and are then requested to re-price the same transaction on a quarterly basis as described in Section 11 below. A series of price relatives is then calculated from the data supplied. Using this pricing mechanism usually ensures that the required prices data is relatively easy to retrieve from the contributor's accounting/financial system and minimises the form-filling burden.

This is an example of a typical contributor's form (references to the contributor and clients for the quoted services have been removed):

**Fig.2 Extract from a Typical CSPI Inquiry Form for Freight Transport by Road**

<b>INDUSTRY SECTOR</b>	<b>DESCRIPTION OF SERVICE YOU PROVIDE (Please refer to the notes at Section 4 of the form.)</b>	<b>Price quote for: Q1/2002</b>
<b>1. Agriculture and Livestock</b>	44 tonne articulated vehicle - full load, wheat from Lincoln to Girvan.	£455
<b>2. General Haulage (inc. rental of truck with driver)</b>	44 tonne articulated vehicle - 48 pallets of consumer goods from Sunderland to Clwyd.	£387
<b>3. International</b>	44 tonne articulated vehicle - full load, white goods from Didcot to Padova (Italy).	£1,900
<b>4. Tankers</b>	44 tonne articulated vehicle - full load, bulk powder from Teesside to Manchester.	£280
<b>5. Temperature Controlled Transport</b>	40 ft. articulated fridge box vehicle - 60 pallets of food coating from Banbury to Whittlesey.	£175
<b>6. Tipping and Construction</b>	38 tonne tipper vehicle - full load, coal from Cumnock to Longannet Power Station, Kincardine	£154
<b>7. Warehousing and Distribution</b>	Receiving pallets of general merchandise into warehouse, placing in storage and re-loading to vehicle (price per pallet).	£2.80
<b>8. Other</b>	None.	

The initial recruitment form would look very similar to this, but with one additional column seeking turnover information for each relevant industry sector for the base year (currently 1995). This turnover information was used to determine the weightings for the price index.

Some will provide more than one example for each type of activity, but that is not the usual practice with the average number of price quotes being between 2 and 3 per contributor.

## **IX Survey Vehicles**

### **A. Initial Sample**

At the time the composition of the original sample was reviewed and revised in 1995, all of the selected enterprises were classified to sub-class SIC 60.24/9 on the IDBR, "Freight transport by road not elsewhere classified". The fundamental classification, employment and turnover data on the IDBR are based on information from several sources (mainly other Government departments, such as Customs and Excise – VAT data).

The current classification for some enterprises may now be different, partly for the reasons outlined previously. But that has no bearing or influence on their continued inclusion in the sample for the regular quarterly prices survey, provided they still carry out the relevant transport service(s). Once selected, an enterprise remains in the panel, irrespective of its current classification, as long as it still provides the services for which prices are supplied. In the normal course of events, major changes to the sample only occur at the time the series is rebased, which offers the opportunity to carry out a review of the parameters of the sample in detail and make revisions if necessary.

### **B. Methods Used to Re-price**

A paper form is sent every quarter to each business included in the sample, seeking the latest prices for the specified services described in the form. Most data are now returned using the ONS' Telephone Data Entry system whereby contributors can return their latest values via a touch-tone facility. Voice messages can be recorded to explain untoward price movements or to provide details of any changes to the key specifications of a contract. The system automatically logs the information and transfers it to the CSPI computer system where it undergoes the standard quality and consistency checks. Any failures are reported for follow-up action.

Other responders prefer to continue to use the paper form to return their latest data, in which case the values are entered and verified on-line by the team's data analysts.

### **C. Strategies to Secure and Maintain Data Quality**

Following their initial development, all CSPI indices are scheduled for quality assurance review at regular intervals. These intervals vary from every 2 to every 5 years and depend on a number of circumstances, including the relative importance of the industry at the top level of the CSPI, the rate of significant change in industry structure and practices and the volatility/robustness of the index.

The review process entails: re-visiting the key development issues; holding an informed dialogue with contributors (about the continued relevance/accuracy of the pricing methodology and industry structure employed, the clarity and design of the questionnaire used in the inquiry and a view on the quality of the current index); and seeking the

opinion of users and external industry experts in other Government departments, trade associations and the like. Below is a short summary of the key steps and objectives.

### ***CSPI QUALITY ASSURANCE PROCESS***

*1. The aim of the quality assurance process is to ensure that credible and accurate data "fit for the purpose" is produced each quarter. Price movements should be representative of the entire industry and the burden on contributors kept to the minimum necessary to achieve acceptable data quality. It should be possible to monitor at least the sampling error of each series in order to establish confidence. The views of contributors, trade and other professional bodies and users are important and should be taken into account in the QA process.*

*2. This systematic review provides an opportunity that must not be missed to re-visit the whole question of the price collection mechanism(s) used for the industry and apply knowledge gained since the industry was first developed.*

*3. The list below sets out the main steps in the QA process, many of which cover more or less the same activities identified as phases of the process of developing an industry.*

- *Examination of existing data and sampling errors, etc.*
- *Consultation with contributors, trade associations and users.*
- *Re-examination of the industrial structure.*
- *Re-examination of sample and questionnaire design.*
- *Production of interim report on findings.*
- *If significant change is NOT required then:*
- *Monitor effects of any minor changes for x quarters.*
- *Production of final QA report.*
- *If significant change IS needed then:*
- *Test the new sample and/or questionnaire.*
- *Continue interim collection of the "new" data while continuing collection of the "old" data.*
- *Produce the final QA report*
- *Establish regular collection of new data and stop collection of old data.*

### **D. Future Improvements.**

In general, the current internal procedures and practices adopted by CSPI are considered to be reasonable and provide a fairly comprehensive coverage of the industry and its various activities. There is room for improvements to be made, however, which will increase the robustness and overall quality of the index, thereby adding to customer confidence when using the data. Through attrition and loss of price quotations, the current sample in terms of size and composition could not be described as optimum, for example.

CSPI has already started work to address these issues in two major ways, Firstly, the industry is undergoing its first regular and systematic quality assurance review and early

discussions have taken place with external users and industry experts. The views expressed so far are encouraging and their concerns echo and support CSPI's own evaluation of the shortcomings of the data series. Polling of the data contributors has also been done and the general response on the way in which the survey is conducted, the pricing methodology employed and the fundamental industry structure has tended to be favourable. Further work on the review is ongoing.

The second opportunity for making changes and improving the quality arises through the CSPI rebasing and recruitment exercise which is currently under way. These linked projects have the overall objectives of producing a new index series based on 2000=100 by mid-2003, doubling the total number of data contributors to 2000+ for industries in the published series and increasing the number of live price quotations by at least 50% (4,500 – 5,000 in total).

Some of the industry-specific issues which are being addressed in these initiatives include:

- ensuring the industry structure reflects the current modes of operation adequately and accurately;
- increasing the sample size in terms of number of contributors and its composition;
- achieving better, in-depth coverage of each of the branches of the family tree, increasing the potential for publication of price indices at a greater level of detail;
- increasing the number of valid price quotations;
- examining the potential for filling gaps in the present coverage – for the spot market contracts, for example, which must still form a very significant part of overall activity (are prices significantly different, are they likely to be more volatile, what prices would we collect as each contract is likely to be unique – average cost per tonne/mile or tonne/kilometre for the same types of cargo, perhaps);
- should the scope of the survey be extended to those major enterprises which are now classified elsewhere in the transport related activities included in the SIC, but which still have significant road freight business;
- are productivity improvements (with the introduction of larger vehicles, for example) fully taken into account;
- are contract specification changes which materially affect the performance of the service being identified and accorded consistent and appropriate treatment.

Progress has already been made in some of these areas, especially on the size and composition of the sample and the depth and scope of coverage of the various activities. Early results from the recruitment exercise, which has already been completed for this industry, show an additional 100+ contributors providing almost 200 new price quotations will be added to the regular quarterly survey. Minor changes may also be made to the structure of the industry arising from data and comments supplied for a major turnover survey, conducted as part of the rebasing exercise.



## **X Time Series and Analysis of Published Indices**

Table 3 illustrates the current series for the freight transport by road indices published by the ONS: the table shows the international freight which is a component part of the composite index. The table and the following charts show the latest index values up to Quarter 2, 2002 and the annual rates of change.

The general view of those consulted in the quality assurance review completed to date is that the index is a reasonable representation of price movements in the industry over the period shown. Despite problems with the attrition of the sample, the index has remained relatively robust and has reflected the impact of critical factors determining pricing policy in the industry at the appropriate time and of the right magnitude, e.g. changes in fuel prices. There is no doubt, however, that the quality, robustness and fitness for purpose will benefit from the potential improvements noted above, amongst others.

Road haulage is a major element in the present CSPI Top-level Index with a weight in excess of 28% (second only to property rentals in its significance). For that reason, the charts include the top-level index for comparison purposes and to illustrate the influence of freight transport by road.

The chart at fig.3, clearly indicates how prices for international transactions remained relatively stable, compared to the overall movements recorded in the composite index. This could be due to a number of reasons, such as the level of competition from overseas hauliers, but is also probably due to the fact that the availability of cheaper fuel in most European countries provided a significant advantage to operators in this sector.

**TABLE 3**  
**CORPORATE SERVICES PRICE INDICES - EXPERIMENTAL SERIES**  
**(1995=100)**

SIC(92)	Freight	Component
	transport by road	index: International
	6024	60243
<b>1995</b>	100.0	100.0
<b>1996</b>	103.6	101.1
<b>1997</b>	110.1	104.8
<b>1998</b>	113.2	104.8
<b>1999</b>	115.8	102.0
<b>2000</b>	123.6	103.4
<b>2001</b>	132.9	104.9
<b>Percentage change, latest year on previous year</b>		
<b>1996</b>	3.6	1.1
<b>1997</b>	6.3	3.7
<b>1998</b>	2.8	0.1
<b>1999</b>	2.4	-2.7
<b>2000</b>	6.7	1.3
<b>2001</b>	7.5	1.5
<b>Quarterly index values</b>		
<b>1995 Q1</b>	99.0	99.0
<b>Q2</b>	99.4	99.4
<b>Q3</b>	100.2	100.2
<b>Q4</b>	101.2	101.4
<b>1996 Q1</b>	102.4	101.6
<b>Q2</b>	103.0	100.0
<b>Q3</b>	103.3	100.2
<b>Q4</b>	105.6	102.5
<b>1997 Q1</b>	108.0	101.7
<b>Q2</b>	110.2	105.8
<b>Q3</b>	110.9	105.8
<b>Q4</b>	111.2	105.8
<b>1998 Q1</b>	112.0	104.8
<b>Q2</b>	113.3	105.3
<b>Q3</b>	113.5	105.4
<b>Q4</b>	113.9	103.8
<b>1999 Q1</b>	114.2	103.5
<b>Q2</b>	114.8	101.8
<b>Q3</b>	116.1	101.5
<b>Q4</b>	118.2	101.4
<b>2000 Q1</b>	118.6	102.3
<b>Q2</b>	121.9	102.3
<b>Q3</b>	125.4	102.9
<b>Q4</b>	128.6	106.0
<b>2001 Q1</b>	131.3	106.0
<b>Q2</b>	132.3	106.3
<b>Q3</b>	133.6	102.2
<b>Q4</b>	134.5	105.2
<b>2002 Q1</b>	133.7	105.2
<b>Q2</b>	134.9	105.1

Charts for Freight Transport by Road

Fig. 3

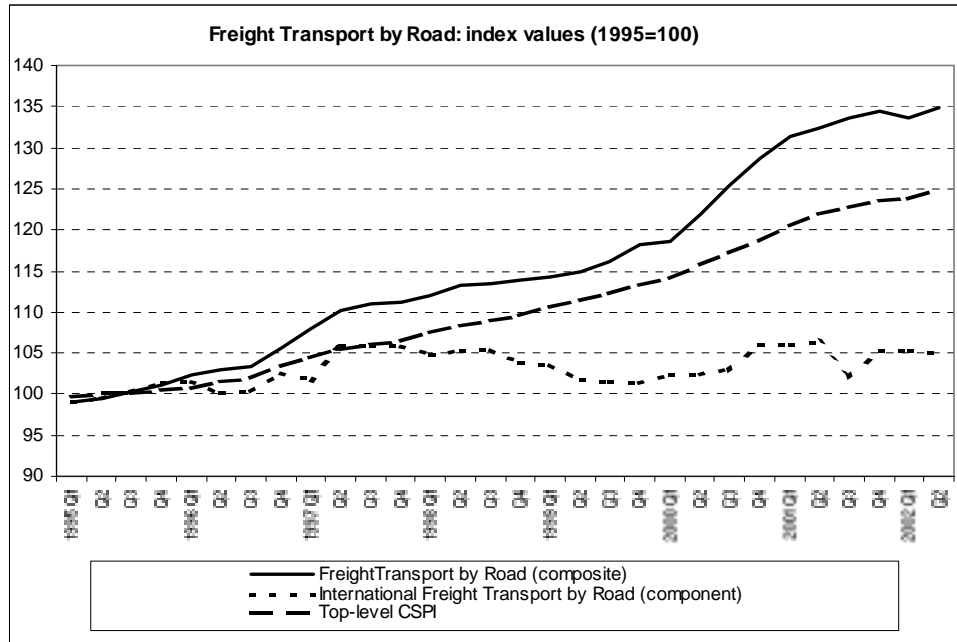
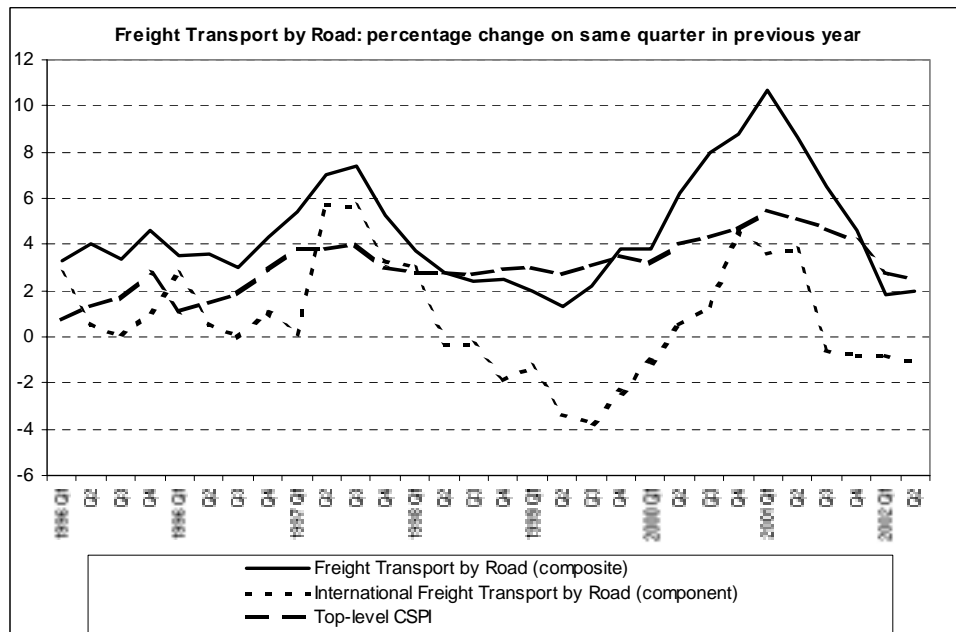


Fig.4



## **XI Overview of Appendices**

Appendices are provided by Australia, the Netherlands, the USA and New Zealand.

The Australian, Dutch and US paper follow similar themes. Both detail what has been developed based on the relevant industry's mode of operation and the categories of services, how it is affected by government regulation, the pricing methodologies employed and concerns about the quality and limitations of the current outputs. The current data series are also included.

The paper from New Zealand again covers the business model but also describes the types of transactions and how the various services covered are priced. The paper also highlights a problem concerning the treatment of "road user charges", i.e. whether they are a tax or a fee for services provided.

It is also apparent that most other countries include furniture removals as part of their road freight price index. These cover services to householders as well as to businesses. Domestic removals services are outside the scope of the UK CSPI.

## **XII Acknowledgements**

The ONS gratefully acknowledges the contributions made in the form of views and comments offered and information supplied by:

- Department for Transport;
- Freight Transport Association;
- Road Haulage Association; and
- Ariadne's Market and Business Development Reports  
which have been invaluable in the compilation of this report.

## Annex 1 – Australia

### **Road Freight Services Producer Price Index 17th Voorburg Group Meeting**

**Authored by Carolyn O'Rourke**

#### **a. Business Model**

The Australian road freight industry is characterised by a large number of smaller road transport operators due to the ease of entry into the industry. The larger companies tend to earn the majority of their revenue from ongoing contract work for established clients while the smaller companies tend to work more on an irregular ad hoc basis. The majority of the smaller companies and individual truck owners operate as "subbies" (i.e. they sub-contract from trucking companies which have the prime contract for the movements of freight).

Some of the larger road transport companies subcontract out their transport activities to smaller companies because it is cheaper and more convenient to do so. This involves the larger company paying the smaller operator to carry its freight when required as an employee of the larger company, while at the same time allowing the smaller operator to carry freight for other clients. Companies with their own road freight fleet that move freight specifically on the company's own account are out of scope for this index because true market transaction prices cannot be collected.

Over recent years, the road transport industry has undergone substantial change in relation to the diversification of activities. A significant contribution to change has been the emergence of logistic handling operators formerly road transport companies. Logistic operators move goods using a range of modes of transport and can include other related transport services such as warehousing and stock control facilities. Often a contract is negotiated to provide a range of services to the purchaser, not simply road freight services. This has implications for pricing road freight activities explicitly as separate prices for service lines are required for data collection which imposes a greater respondent burden.

For the purposes of this index, the road freight industry has been split into the following categories: general freight, bulk freight, express freight, car carrying, chemical freight, containerised freight, livestock, beer/wine, and furniture removals. This index covers both short and long haul freight transport.

#### **b. Overview of government regulation**

There is no government regulation of the Australian road transport industry. There is a peak industry body which acts as a conduit to government on issues relating to the road transport industry. Prices tend to be driven by market forces, in particular fierce competition between road freight operators exists. In addition, competition with alternative modes of transport (i.e. rail and sea) is in place. For some sectors of the road transport industry, seasonal pressures affect price, e.g. furniture removals. As this index is structured by road freight categories, prices for these categories can move in opposing directions thereby offsetting the final industry price index.

Deregulation of parts of the Australian rail network has resulted in increased competition between road and rail freight for long haul operations. However, this has not impacted on short haul freight deliveries. For logistics firms which can move freight using both rail and road, there are opportunities to increase their market share. This is, road and rail freight services can act as complementary activities. For example, logistics firms can transport containers via the rail network and then load onto trucks at the rail terminals.

### **c. Final pricing methodology employed**

Generally, the pricing methodology selected is specification and contract pricing. Particular pricing methodologies employed are outlined below according to the respective road freight categories.

**General Freight:** This category contains firms whose operations move different kinds of freight consistently and do not specialise in one type of freight. In most cases, these companies are involved in the distribution activities of large retail or wholesale operators and move stock from distribution centres to their final place of sale. The prices in this category are normally denominated in a \$/tonne, \$/pallet, \$/load or \$/FCL (forty foot container) basis.

**Bulk Freight:** As the name suggests, the firms in this category move commodities in bulk loads. The main commodities moved are coal, steel products, aluminium, grain products, milk, cement, parcels and wool. The prices in this category are denominated in many different ways depending on what is being moved.

**Express Freight:** This category could also be called time-sensitive or overnight freight as the emphasis in this industry is on how quickly the freight is moved from one place to another. The major players in this market offer rates for different tiers of customers who are sorted according to how much they spend with the company during the previous month. The more they spend the previous month, the more reasonable the rate that they get from the express freight company. The prices in most cases here are calculated by applying a kilo rate to the weight of the parcel and then adding a basic charge on top of that. We have collected an average parcel weight from the respondents who use this pricing method and have used this average weight to calculate one part of the price and then added the basic charge on top of this to get the total price.

**Car Carrying:** In this case, the companies involved transport different kinds of cars, both for car manufacturers and for members of the public. In the majority of cases in our index, the companies are moving cars on contract for the manufacturers with the exceptions of a few carriers who are supplying a price for moving for the general public. The main pricing basis in this cell is \$/vehicle (also called \$/unit) for the various origin and destination points.

**Chemical Freight:** The firms in this industry transport large volumes of a range of chemical substances such as explosive substances, fertilisers, petrol and gas. The main pricing basis is \$/tonne for the selected origins and destinations.

**Furniture Removals:** This industry involves the moving and storing of household possessions. The prices move according to whether it is the peak season or not. During the peak season (October to March) the prices are generally a lot higher than in the non-peak season. The prices

are normally denominated in \$/cubic metre for moving goods and storage and \$/hour for the use of the truck and the manpower to pack and move the goods. For storage services, we have collected a price for listing and moving the goods to the place of storage and a separate charge for the actual storage of the goods but both are in a \$/cubic metres basis. The storage pricing data is utilised in the Storage nec price index (ANZSIC 6709).

**Beer/Wine Freight:** Here, beer, wine and any other alcoholic substances are moved by the companies providing data. The main denomination of the prices are \$/tonne, \$/carton or \$/pallet. In most cases, the goods are transported on a contract basis by specialist transport companies on behalf of the brewers or manufacturers.

**Containerised Freight:** Various goods or substances moved by road freight companies in containers are included in this category. The prices are mainly given in a \$/container, \$/TEU (twenty foot container) or \$/FCL (forty foot container) basis. In most cases, the containers are shipped by road from ports. It is important that we collect prices for the road freight component only.

**Refrigerated Freight:** In this industry, perishable goods such as meat, confectionery and frozen foods are being moved in refrigerated containers on a contract basis for large retailers. The prices are mainly stated in a \$/kilo, \$/tonne or \$/load basis.

**Livestock Freight:** Livestock of various kinds is being transported by the companies in this category. The main ones being sheep and cattle. The major operators in this area are Clayton Cream Transport and GW & GG Wilson, although most of the companies we have enrolled are on the smaller end of the market. The pricing basis is mixed between \$/head, \$/tonne, \$/animal or \$/loaded deck.

In some categories, a small number of respondents supply price movements in index numbers instead of dollar values.

#### **d. Limitations/concerns about published data**

In relation to scope, both short and long haul freight is covered by this index. Predominantly pricing data collected relates to long haul operations. The sample for short haul freight could be expanded. In terms of sampling, a large number of companies are enrolled ensuring good coverage for this industry.

Within the road freight industry, special pricing arrangements can occur such as backhaul and double back. These pricing arrangements are spot specials offered to clients when capacity arises. Specification and contract pricing does not capture these changes in spot rates. These special pricing arrangements do not represent a significant proportion of industry transactions.

Privatisation of the Australian rail network is a progressive process with substantial private investment in the rail infrastructure system required to facilitate improved efficiencies in this sector. In terms of the deregulation of the rail network it is imperative that we keep in touch with any quantity shifts between the road and rail sectors for updating weighting purposes.

For express freight operators, there are difficulties distinguishing between road, rail and air freight. In this sector, goods are transported according to a particular time constraint (e.g. overnight) and the companies involved utilise available capacity between the different modes of transport. This is, the client is charged a set price independent of which mode or combination of transport utilised.

Where service bundling occurs, as in the case of logistic handling services, separately identifying service activities can be difficult. In some instances, the price of the whole bundle is recorded.

**e. Analysis of "goodness" of your published data**

The current sample coverage is good with the majority of pricing data related to long haul operations. The sample for short haul could be increased to better represent these activities. In general, current pricing methodologies record and capture real price change in the road freight industry. The published series for the price of road freight services has remained relatively stable over time with, in general, small rises recorded on a quarterly basis.

**Road Freight Producer Price Index** (Base of index 1998-99 = 100.0)

Period	Index number
Sep 1998	99.4
Dec 1998	99.7
Mar 1999	100.5
Jun 1999	100.4
Sep 1999	100.5
Dec 1999	100.7
Mar 2000	100.9
Jun 2000	101.8
Sep 2000	101.6
Dec 2000	102.7
Mar 2001	103.8
Jun 2001	104.2
Sep 2001	104.5
Dec 2001	104.8
Mar 2002	105.2
Jun 2002	105.3

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**Annex 2**

**THE PPI FOR ROAD HAULAGE  
IN THE NETHERLANDS**

Aurél Kenessey  
CBS – Statistics Netherlands

## Producer Price Index for Road Haulage in The Netherlands

### A. Business model

Road haulage is the largest industry within the Dutch transport sector (NACE Divisions 60-63) in terms of contribution to GDP (40% of turnover in 1999) and employees (more than half in 1999). There are over 9,700 companies of which about 80% are categorized as small (less than 10 employees). International transport is very important; about 60% of all trips are border-crossing or international, of which more than half are to, from or in neighbouring countries.

### B. Government regulation

A 1992 law made it easier for new companies to enter the market. Although the law went into effect in 1992, the number of new companies increased since 1988. This new law also set minimum standards for expertise, reliability and solvency. In 1998, this law was amended and regulations became stricter again.

EU regulations promote a free and open market. This led to an influx of foreign lorries. This increased competition. Another legal measure widened the possibilities for return cargos, which had been restricted. This enabled companies to offer trips that would not have been profitable before.

### C. Pricing methodology

#### *Classification and sample design*

Previous studies from Statistics Netherlands on unit value and hedonic price methods provided information on price-determining characteristics (variables). We also obtained information and data from the industry itself. A list of main price-determining characteristics resulted; see table 1.

**Table 1.** Main price-determining characteristics of trips.

1.	Type of lorry
2.	National vs. international trips
3.	Country of destination or origin
4.	Distance
5.	Special routing (e.g. distribution or joint cargo)
6.	Regular vs. incidental customer
7.	Availability of return cargo
8.	Weight of the cargo
9.	Type of cargo
10	Inclusion of loading services

Experts considered the first two characteristics to reflect different sub-markets that may have separate price development. The publication structure is therefore based on these characteristics. See table 2 for the separate types of lorries regarded in the publication and table 3 for the publication structure.

**Table 2.** Type of lorries distinguished in the Dutch publication structure, with their CPA category.

<u>Type of lorry</u>	<u>CPA</u>
Open or closed box (not specialized)	60.24.21; 60.24.22
Container	60.24.14
Removers	60.24.15 partially (p.)
Tippers	60.25.17 (p.)
Freezers and coolers (temperature controlled box)	60.24.11; 60.24.17 (p.)
Tankers (incl. dry bulk tankers)	60.24.12; 60.24.13; 60.24.17 (p.)
Lorries not elsewhere specified	60.24.15 (p.); 60.24.17 (p.)

**Table 3.** Publication structure of the road haulage PPI in The Netherlands, with index numbers for 2002 2<sup>nd</sup> quarter.

<u>Type of lorry</u>	<u>Price index in 2002 2nd quarter, 1994 q1=100</u>		
	<u>All transport</u>	<u>International transport</u>	<u>National transport</u>
Total	116,7	110,9	122,0
Open or closed box	121,2	109,8	128,9
Container	112,3	112,1	112,3
Removers	122,1	114,6	126,5
Tippers	125,9	115,1	127,6
Freezers/coolers	112,2	111,3	114,9
Tankers	106,6	109,0	104,2
Other	114,0	112,2	117,1

We aimed at stratifying the population into strata that are as homogeneous as possible in their price development. **Two strata** contain small companies with less than 2 employees and 2-9 employees respectively. Medium-sized firms (10-99 employees) are classified into **14 strata**, using turnover data to determine the main activity regarding the type of lorry used and the distinction national vs. international trips. This grouping by main activity coincides with the lowest level publication structure. **One stratum** contains large firms with more than 100 employees.

#### *Surveyed price information*

Transport firms use many different units to state prices, e.g. price per hour, per kilometre or per m<sup>3</sup>. All transport firms can state a price per trip; therefore, **the trip is the basic unit** for which price information is surveyed. Haulers, especially large ones, have many regular clients for whom they perform the same services for many years. Price developments of trips in real contracts can thus be monitored. Other types of price information accepted by Statistics Netherlands are fictitious prices of model trips. These model trips are trips carried out only in the base period; in later periods the respondent provides an estimate for this same trip, although it is not performed any more. If a model trip is too outdated to provide a meaningful estimate,

the respondent selects a new representative trip. Both trips in real contracts and model trips selected for fictitious repricing are extensively specified, including at least all their price-determining characteristics given in table 1. Each company provides between 1 and 20 price quotes for representative trips. The frequency of observation is set at 4 times a year. Many large haulers revise their prices once a year, usually in the first quarter. These are surveyed only once a year. The survey started in 1994 with 215 respondents providing approximately 800 price quotes.

#### **D. Limitations/concerns about published data**

Transport firms provide services related to transport, e.g. storage. Also mixed modal transport including road, water, rail and/or air transport is often offered as one 'packaged' service - an effect enhanced by the worldwide standardization of containers. This bundling of services is not addressed in the current design and methodology.

External experts have questioned the published figures for remover lorries (moving services) because of their comparatively high index numbers and their strong seasonal pattern. We compared the PPI for moving services with its CPI counterpart and found significant differences.

Statistics Netherlands is currently working on reweighting, rebasing and a possible revision of the road haulage PPI:

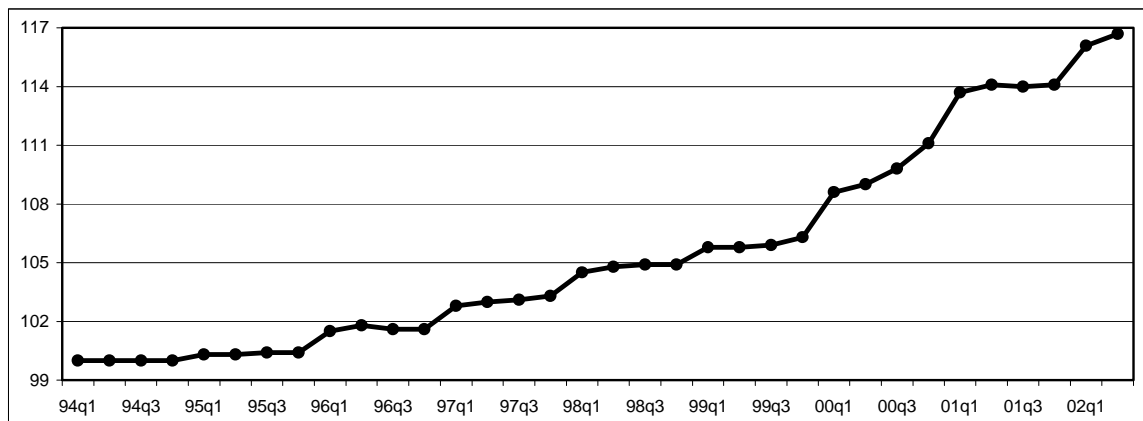
- The sample has not been kept up perfectly. The number of companies and trips will be increased to the original level.
- The weighting scheme is still based on 1992 figures. Along with this, the stratification and aggregation system might be changed, i.e. simplified.
- Some respondents of the turnover surveys which provided weighting schemes, misinterpreted the distinction between national and international haulage. Some took international haulage rightly as border-crossing services, while others mistook it as services for foreign customers. This may have biased the results slightly
- The sub-markets 'Open or closed box' and 'Lorries not elsewhere specified' are merged in the present turnover survey and will probably be merged in the PPI as well. There have been requests for more detailed information in the publication like the transport of cars or a split between intra-EU and extra-EU transport.
- A concern with the present survey is the quality of the price information. Respondents may give simple answers to the survey (e.g. "no price development") too easily. They may continue outdated trips too long to avoid the work involved with replacing them. Last but not least, they may take the calculation of fictitious prices not always seriously, although price developments of real prices from long term contracts and fictitious prices agree well, on average.

## E. Analysis of published data

**Table 4.** PPI for total road haulage from 1994 q1 until 2002 q2; 1994 q1=100

	1994	1995	1996	1997	1998	1999	2000	2001	2002
1 <sup>st</sup> Qtr	100.0	100.3	101.5	102.8	104.5	105.8	108.6	113.7	116.1
2 <sup>nd</sup> Qtr	100.0	100.3	101.8	103.0	104.8	105.8	109.0	114.1	116.7
3 <sup>rd</sup> Qtr	100.0	100.4	101.6	103.1	104.9	105.9	109.8	114.0	
4 <sup>th</sup> Qtr	100.0	100.4	101.6	103.3	104.9	106.3	111.1	114.1	

**Graph 1.** PPI for total road haulage from 1994 q1 until 2002 q2; 1994 q1=100.



The survey started in 1994. The slow rise of the index agrees with the highly competitive market situation in the late nineties. Factors that caused this highly competitive market included a strong increase in the number of competitors, an increase in tendering, and an overcapacity in transport vehicles. This resulted in a strong position for clients in negotiations, and – in the end - a higher increase in costs than revenue for haulers.

The index jumps each year in the first quarter and is relatively steady for the rest of the year. This probably reflects the real market situation, but is enhanced by the survey method in which many companies are allowed to quote new prices only yearly in the first quarter.

## **Annex 3**

### **U.S. Producer Price Index for Long Distance Trucking**

Sally Williams

U.S. Bureau of Labor Statistics

## **A. Business Model**

Trucking, except local is defined by the Standard Industry Classification manual as establishments primarily engaged in furnishing long distance trucking services and storage services, including household goods either as common carriers or under special or individual contracts or agreements and for freight generally weighing more than 100 pounds. Operations are principally outside a single municipality, outside one group of contiguous municipalities or outside a municipality and its suburban areas.

The Producer Price Index's (PPI) Trucking, except local index is divided into three main categories: household goods moving, general freight trucking (which is subdivided into two cells, less than truckload and truckload), and other trucking except local. The Household goods moving cell consists of companies that generally move three types of goods: personal effects and property used or to be used in a dwelling, furniture, fixtures, and other property of stores, offices, museums, institutions, hospitals, etc., and articles including objects of art. The general freight trucking cell includes establishments primarily engaged in providing trucking or transfer of general merchandise (defined as material or goods of many varieties that are packaged, generally palletized, and carried in a box or container and do not require special services such as refrigeration or controlled humidity). General freight trucking was split by the United States Census into truckload and less-than-truckload. Truckload is defined as shipments (generally greater than 10,000 pounds) moved as a full single load not in combination with other shipments. While less-than truckload is defined as multiple shipments (generally less than 10,000 pounds) combined into a single truck for multiple deliveries within a network. The other trucking, except local cell contains services such as agricultural freight trucking, hazardous materials trucking and all other specialized trucking services.

The United States uses the hub and spoke system to minimize the cost of shipping multiple small loads. Shipments to be delivered are given an originating spoke, a destination spoke and a shipment volume. Since truck types vary according to capacity, speed and cost, the hub and spoke model enables companies to determine the right number of trucks per route, in order to maximize efficiency. There is a minimum and maximum departure and return time as well as a load and unload time for trucks at each spoke. The essence of the model is to evaluate volume constraints and schedule loads accordingly, minimizing costs and shipment time.

Trucking, except local accounts for a relatively large part of the U.S. economy, comprising 47,315 establishments, 915,091 employees and annual revenue of \$105,764,108,000. The number of establishments grew 15.9% between 1992 and 1997, paid employees increased 20.7% and annual revenue grew 35% (1997 economic census). Less-than-truckload (LTL) trucking has seen considerable growth in the past decade. It has become a very important part of the industry, accounting for a large part of the industry's overall revenue. According to the 1997 economic census LTL trucking establishments in the United States total at approximately 6,000 firms and bring in an annual revenue of 2.5 billion dollars. Truckload (TL) establishments (which tend to be smaller in size than LTL establishments) total approximately 23,000 firms and generate revenues of 5.1 billion dollars a year. These figures show that although there are

considerably fewer LTL firms than TL firms, they generate more revenue per establishment and earn a fourth of the total revenue produced by long distance trucking. It is also important to take into consideration that these figures do not include large corporations that handle their own transportation needs. Across all sectors, this has been a booming industry within the last ten years. However, as with many other industries in the United States, over the past year growth has been slowing down and prices have begun to rise. Unstable gasoline prices are the leading culprit behind the increasing costs, and greatly affect the movement of the trucking index.

## **B. Government Regulation**

Government regulation has played a major role in the trucking industry in the past. Prior to 1980 federal agencies heavily regulated the trucking industry. The Motor Vehicle Act of 1980 deregulated the market and allowed competition to take over. However, many analysts still view the market as quasi-regulated due to many laws, permits and taxes that greatly affect the state of the industry and are a major cause of rising prices within the industry. In 1995 the Interstate Commerce Commission (ICC) Termination Act removed more remnants of federal economic control. The act terminated the ICC and transferred some of its economic regulatory responsibilities to the Surface Transportation Board, an independent body within the United State's Department of Transportation. Currently, there is no Federal law that requires trucking establishments to file tariff rates. For intrastate truck transportation some states do require companies to file tariff rates but the majority do not. The only time trucking companies must file tariffs, within any state, is when a shipment involves multiple forms of transportation. However, the PPI does not track the trucking component of an intermodal shipment in SIC 4213, and therefore the intermodal tariff filing regulation is not applicable to our index. Today, tariff rates are almost synonymous with list prices, and are mainly used as a negotiating tool in formulating contracts.

Although there are no longer any federal agencies that set direct rates, as they did before 1980, safety charges, environmental taxes and fuel surcharges influence prices within the industry. Rates are set by trucking establishments and are regulated only by the competitive nature of the market. There is free entry and exit in the market and because of deregulation the industry has grown. Still, there are several unresolved legislative and regulatory issues that have major implications for motor carriers. Some of these are safety, user charges, and vehicle emissions. Safety may be the foremost issue affecting the industry today. User charges, truck size, and weight limits remain critical to motor carriers. The industry maintains that its excise tax payment on fuel, tires, and heavy equipment adequately covers truckers' share of highway wear and tear. Further, they seek legislative approval to carry even heavier and larger loads. However, many other interest groups disagree and so the stakes in this debate are very high. Environmental issues are receiving continued interest. Many legislators continue to target auto and truck emissions through pushing cleaner fuel, emission control equipment, higher fuel prices, or some combination.



### **C. Pricing Methodology**

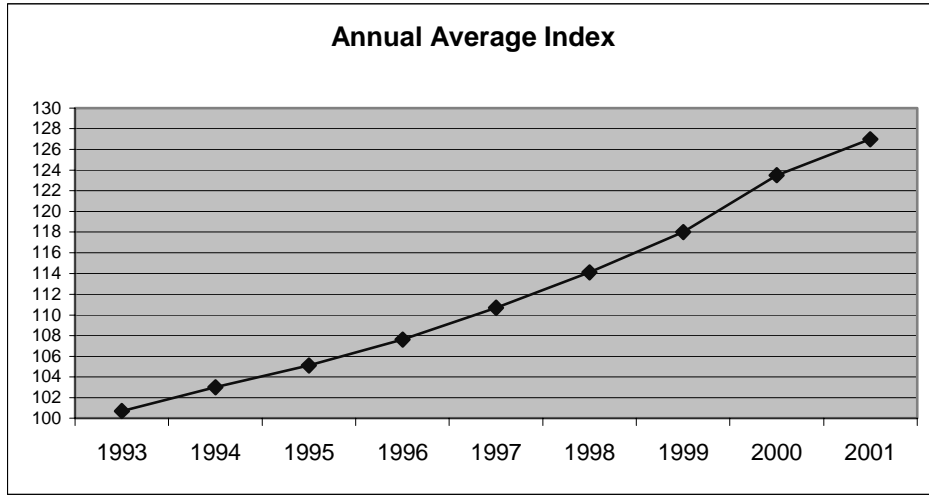
The Producer Price Index uses a sample frame from the Bureau's administrative file. Currently our frame consists of about 240 sample units. Companies are organized nationally. Each company may have many locations across the country. These would be clustered together to form a single sample unit. Each sample unit is assigned a number of items for collection, ranging from 2 to 16, depending on its size (based on employment data). The PPI attempts to be more representative by assigning more items to larger companies and fewer items to smaller establishments.

The price determining characteristics for SIC 4213 are based on the type of product shipped, size and weight of the shipment, distance moved, special services and storage of goods. The size of shipment tends to be the most important price-determining factor. Prices are usually set in ranges of hundredweight and the larger the quantity, the lower the per hundredweight price. Price estimation is based on holding these characteristics constant along with the shipment's origin and destination.

There are four different types of prices: spot, contract, list and tariff. A spot price is a price that is negotiated between the customer and the local trucking company for a single transaction. This type of price is the most common and is less than the list price but typically greater than a contract price. A contract price, which is also very common, is usually associated with large corporations or companies. It allows the customer to be guaranteed a below market rate while at the same time receiving full or other premium services from the trucking company. This type of price is usually below the market rate due to the negotiating power of the customer. In return the customer promises a specified volume of business. A list price is the published price. This price is usually the starting point at which the negotiating is done to arrive at a spot price. However, it does not reflect the actual net transaction price unless all discounts are known. The tariff price is a published price list of rates, based on mileage and weight, and additional services. The additional charges must be charged when applicable. Tariffs may be divided into two basic and broad types - governing and specific. An illustration of a governing (that is, rules and regulations) tariff would be a rules tariff or a routing tariff. An example of a specific (that is, rates) tariff would be class, commodity, or exception tariffs.

There is also a pricing section that takes into consideration adjustments to price, such as any discount or surcharges. It is common in the trucking industry for companies to offer incentive programs. Most companies offer cash, trade, quantity, cumulative volume and seasonal discounts. A competitive discount is a general term used for all discounts that respond fluidly to changes in supply and demand market conditions and are generally short term. There are two very frequent surcharges added to the base price. The first charge is a fuel surcharge. When the price of fuel jumps unexpectedly most companies add a fuel surcharge to the bill. The other surcharge is a minimum weight charge. This surcharge guarantees the trucking company a minimum price for performing the service. The PPI calculates the trucking index using the net price, which takes into consideration the base rate of shipment and any adjustments to price the carrier applies.





**Annex 4**

**ROAD FREIGHT SERVICES  
IN THE NEW ZEALAND  
PRODUCERS PRICE INDEXES**

**BY**

**Michael Webster**

## **Business Model and Pricing Methodology**

Statistics New Zealand's road freight transport industry is comprised of those units classified to ANZSIC 96 (Australia and New Zealand Standard Industrial Classification 1996) under 6110 - Road Freight Transport.

Road freight transport is classified as units mainly engaged in the transportation of freight by road, as well as units mainly engaged in renting trucks with drivers for road freight transport. Transport services that are carried out by the same units that produce the goods, on their own account, are measured as inputs of the industries in which the production units are classified, and are therefore excluded from the index. Also excluded from the index are the activities of:

- road freight forwarding (included in ANZSIC Classification 6642 - Road Freight Forwarding),
- providing road freight terminal facilities/ services on a contract or fee basis (ANZSIC Classification 6619 - Services to Road Transport n.e.c.)
- crating or packing for road freight transport on a contract or fee basis (ANZSIC Classification 6649 - Services to Transport n.e.c.)
- leasing or hiring trucks from own stocks, without drivers (ANZSIC Classification 7741 - Motor Vehicle Hiring).

The primary activities defined for the road freight transport industry are:

- Delivery service, road (except courier)
- Furniture removal service (road)
- Log haulage service (road)
- Road freight transport service
- Taxi truck service (with driver)
- Truck hire service (with driver)

Approximately 40 different respondents are surveyed, using the postal Commodity Price Survey. Of these respondents, there is a large number of small operators and a small number of large operators. Companies in the survey that we sample represent approximately 9 percent of gross output and 10 percent of intermediate consumption of the road freight transport industry. A range of prices is collected for the transport of specific goods, in particular agricultural products, general goods, livestock and timber. Other sources of data received are from the New Zealand Road Transport Association, and the Ministry of Transport.

Prices are carried forward one period (imputed) for a non-response.

Weighting of the index was done predominantly on the basis of Gross Output values generated from the New Zealand Annual Enterprise Survey (AES) 1995 data.

### **What we price:**

One of the difficulties associated with this industry was how to decide the basis for pricing the product groups. Road freight can be classified according to cargo type; vehicle type; distance (rural, urban, national); and rate type (cost per tonne, kilometre, container, or time).

Prices were chosen to deliver a mixture and therefore adequate representation of all of these factors, using the relative prevalence of a pricing method in the industry.

### **Refrigerated Transport**

Tonnage rates: Charge for carting an amount of refrigerated goods a fixed distance.

### **Livestock Transport**

Tonnage rates: Charge for carting an amount of various goods a fixed distance.

Goods include:

- Cattle (per head)
- Lambs (per head)

### **Bulk (Aggregate) Transport**

Tonnage rates: Charge for carting an amount of various goods a fixed distance.

Goods include

- General goods (per tonne)
- Metal (per cu. m)
- Fertiliser (per tonne)
- Hay (per bale)
- Coal (per tonne)
- Wool (per bale)
- Grain (per tonne)
- Hides (per tonne)
- Shingle (per tonne)
- Fruit (per tonne)

Container Rate: Charge for carting a 20 foot I.S.O. Container from various sources a fixed distance.

Sources include:

- Ex Rail
- Ex Wharf

May also include cost of cartage of empty container back to source.

Tonnage rural rates: Charge of carting an amount of agricultural products in rural areas, for a fixed distance.

Time Rate for Truck/Driver: Charge per hour for the rental of truck and driver for various truck types.

Truck Types:

- Hiab Truck, 2 Tonne Capacity
- 8 Tonne Flatbed Truck
- 16 Tonne Articulated Truck
- Articulated Tip Truck

Mileage rate for Truck/Driver: Charge per kilometre for rental of truck and driver for various truck types.

Truck Types:

- Hiab Truck, 2 Tonne Capacity
- 8 Tonne Flatbed Truck
- 16 Tonne Articulated Truck
- Articulated Tip Truck

### **Logging Transport**

Tonnage rates: Charge for carting an amount of various goods a fixed distance.

Goods Include:

Timber; logs (per tonne; cu.m)

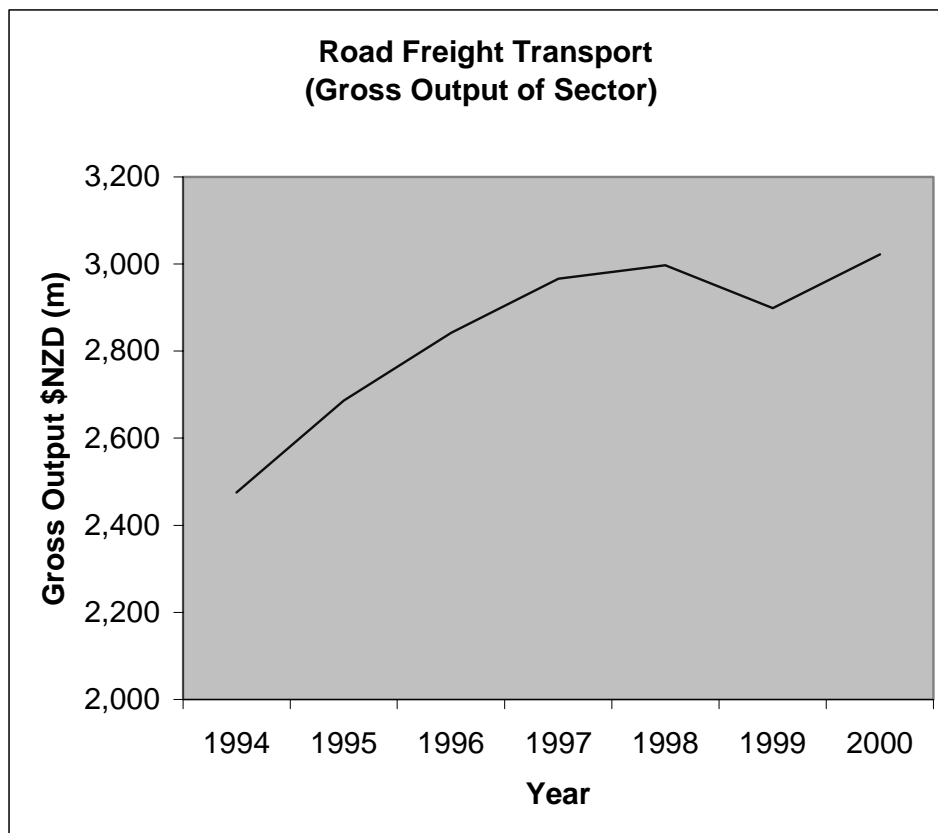
### ***General (Parcel & Package Transport)***

Parcel Delivery: Charge for delivering a fixed size parcel from various sources to door.

Sources Include:

- Rural delivery
- Inner City Delivery
- Ex Rail

Tonnage city-city rates: Charge of carting an amount of general goods from one predefined major city to another; door to door.



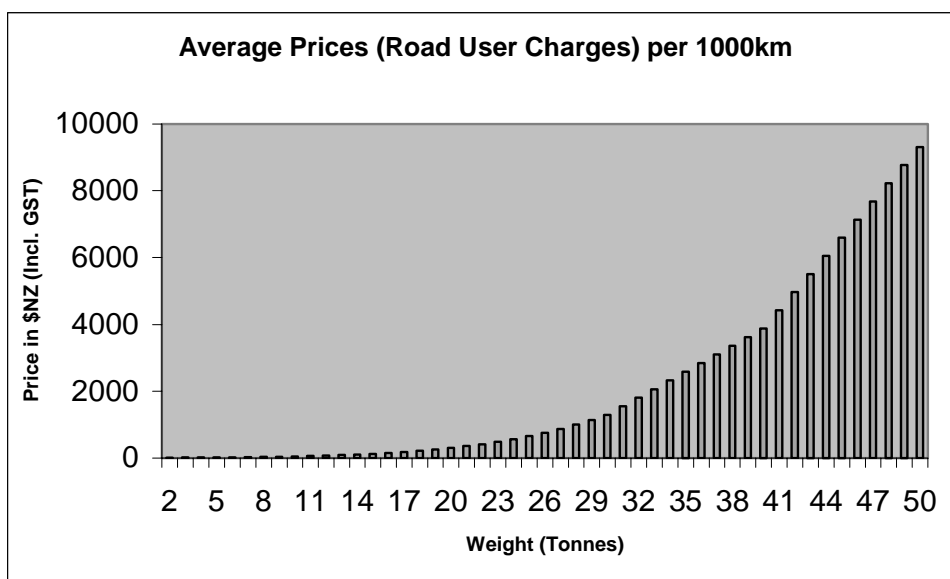
<b>Year</b>	<b>Gross Output</b>
1994	2476
1995	2686
1996	2842
1997	2966
1998	2997
1999	2898
2000	3022





## Government Regulation - Road User Charges

Road user charges (RUCs) are a levy by the Government for the purpose of recovering the cost of using the New Zealand roading network. All diesel powered vehicles; all vehicles of more than 3.5 Tonnes; and all vehicles 3.5 Tonnes or less powered by a fuel not taxed at source are subject to RUCs. In effect it is similar to a tax which is collected on petrol, but with a different collection strategy. RUCs are charged on the basis of distance travelled and tonnage; Because heavier machines cause significantly more damage to roads, basing the levy on axle weight and kilometres travelled helps to reflect this.



The RUC is classified as an instance of a Commodity Indirect Tax, a tax on commodities which are proportional to the quantity or value of commodities sold (in this case distance travelled).

There is a standing argument regarding the classification of the RUC as a fee charged for providing a service, in which case it should be included in Intermediate Consumption of the PPI Index; or as an indirect tax, in which case it should be omitted. The argument centres on the distinction between a tax and a fee outlined in the System of National Accounts 1993 (SNA93). It states:

*"One of the regulatory functions of governments is to forbid the ownership or use of certain goods or the pursuit of certain activities, unless specific permission is granted by issuing a licence or other certificate for which a fee is demanded. If the issue of such licences involves little or no work on the part of the government, the licences being granted automatically on payment of the amounts due, it is likely that they are simply a device to raise taxes..."*

*However, if the government uses the issue of licences to exercise some proper regulatory function, for example... carrying out some other form of control which it would otherwise not be obliged to do, the payments should be treated as purchases of services from government rather than payment of taxes... "*

For RUCs, it can be argued that either because the issue of the licences involves little or no work by the government, and are granted automatically, it is therefore a tax; or alternatively, that because the payments are put into the dedicated National Roads Fund which is used to upkeep the transport network, it is a fee charged for providing this upkeep.

Because the view that Statistics New Zealand's National Accounts Division takes is that RUCs are an indirect tax, an explicit index of road user charges is omitted from the PPI indexes for intermediate consumption.

However, it is not unreasonable to assume that transport companies reflect an increase in RUCs by passing some of the additional cost to consumers in their market prices. Because the RUCs, according to the agreed definition, should not participate in the Producers Price Index, this added margin should be removed. In current models, this is not occurring, which may lead to inaccurately high price inflation for the road transport sector when new higher RUCs came into effect from 1 April 2002.

### **Limitations/Concerns**

The treatment of excluding RUC's from the PPI Outputs index weighting regiments means that we should really be pricing the provision of transport services exclusive of RUC's. Since the industry does not charge for services in a manner that enables prices exclusive of RUCs to be calculated, there is an inherent flaw in the PPI pricing methodology in this area. Analysis will need to be made in the future to determine the impact made by hikes in Road User Charges, and with our current Road User Charges Index some form of deflation may need to be calculated.

Although treating Road User Charges as indirect taxes is the prevalent method in National Accounts, there is plenty of argument that can be given to support either the treatment of RUC's as an indirect tax or as a fee for services. Work still needs to be done in the conceptual areas behind RUC's.

The industry has a very large population of small players within it. The ideal aim of our sampling selection process is to select a sample so that 80 percent of the Production Group within the industry is covered. The size of the sample required to obtain this amount was approximately 434 respondents, at the time of the last revision in 1998. Due to resource constraints, this figure was not viable; thus the current sample size of approximately 40 companies was used instead. The size of the sample has had an adverse effect on the quality of the road freight services index.

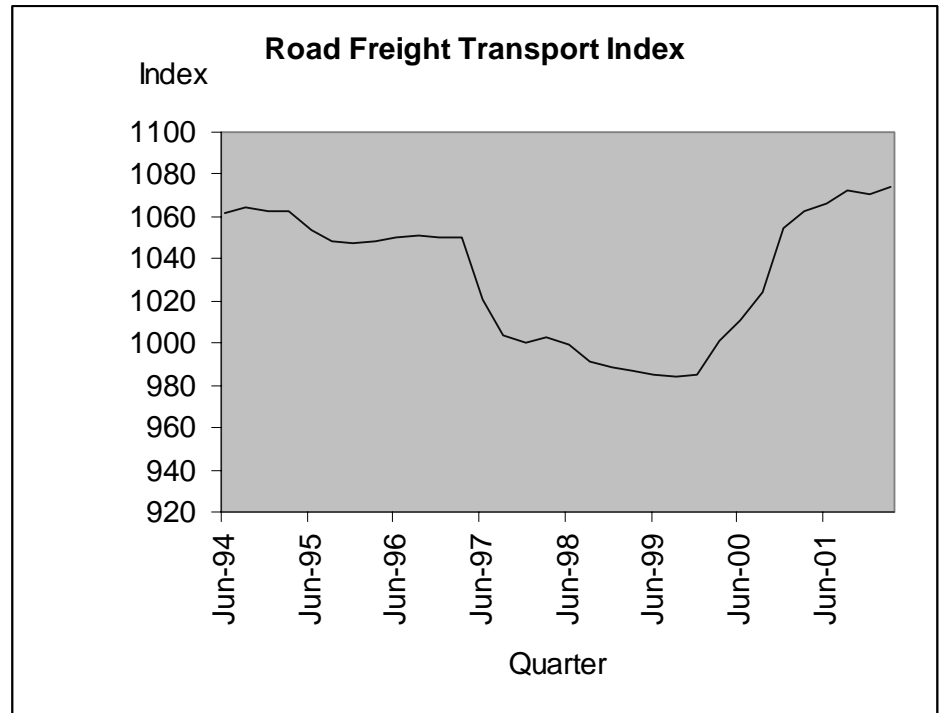
Analysis must be made regarding how much of the industry it would be viable to sample for the next redevelopment of this index, given time, budgetary constraints and respondent load.

#### **Analysis of “Goodness” of Data**

The index for road freight services is ‘good’ up to a point; that is, it shows the general price trends and movements of the road freight sector. At a lower level, however, the data fails to be precise. It includes the prices carried down for road user charges from producers to consumers, which by definition should not be included in the index. The sample is too small and the quality of data cannot be assured. Weighting data is 7 years old and during this time there have been substantial changes in the industry. Caution is recommended when using this index.

### Road Freight Index

Quarter	Data Value
Jun-94	1062
Sep-94	1064
Dec-94	1063
Mar-95	1063
Jun-95	1054
Sep-95	1048
Dec-95	1047
Mar-96	1048
Jun-96	1050
Sep-96	1051
Dec-96	1050
Mar-97	1050
Jun-97	1021
Sep-97	1004
Dec-97	1000
Mar-98	1003
Jun-98	999
Sep-98	991
Dec-98	989
Mar-99	987
Jun-99	985
Sep-99	984
Dec-99	985
Mar-00	1001
Jun-00	1011
Sep-00	1024
Dec-00	1055
Mar-01	1063
Jun-01	1066
Sep-01	1072
Dec-01	1071
Mar-02	1074



The index fall over the 1996-1997 period, due to falling fuel prices. Over the 2000-2001 period, the index rose, due to the rise in fuel prices. Fuel prices are largely responsible for movements in the Road Freight Transport index.

**Annex 5****Bank of Japan: Corporate Services Price Index**

Weight	Road freight transportation			Road freight transportation			
	Total	Less-than-	Truckload	Total	Less-than-	Truckload	
		truckload	freight		freight	truckload	freight
	84.6	15.6	69	84.6	15.6	69	
1995.01	100.4	100.1	100.5	1999.01	99.0	102.0	98.3
1995.02	100.4	100.0	100.5	1999.02	99.0	102.0	98.3
1995.03	100.4	100.0	100.4	1999.03	99.0	102.0	98.3
1995.04	100.3	99.9	100.4	1999.04	98.9	102.0	98.2
1995.05	100.1	99.9	100.2	1999.05	98.9	101.9	98.2
1995.06	100.1	99.8	100.2	1999.06	98.7	101.9	98.0
1995.07	100.2	100.2	100.2	1999.07	98.7	101.9	98.0
1995.08	99.9	100.0	99.9	1999.08	98.7	101.9	98.0
1995.09	99.8	100.0	99.7	1999.09	98.7	101.9	98.0
1995.10	99.4	100.0	99.3	1999.10	98.7	101.9	98.0
1995.11	99.5	100.0	99.3	1999.11	98.7	101.9	98.0
1995.12	99.5	100.0	99.3	1999.12	98.7	101.9	98.0
1996.01	99.5	100.0	99.3	2000.01	98.7	101.9	98.0
1996.02	99.5	100.0	99.3	2000.02	99.2	101.9	98.6
1996.03	99.5	100.0	99.3	2000.03	99.0	101.9	98.3
1996.04	99.4	100.0	99.3	2000.04	98.9	101.9	98.2
1996.05	98.5	100.1	98.1	2000.05	98.8	101.9	98.2
1996.06	98.5	100.1	98.1	2000.06	98.8	101.9	98.2
1996.07	98.2	100.1	97.8	2000.07	98.8	101.9	98.2
1996.08	98.2	100.1	97.8	2000.08	98.8	101.9	98.2
1996.09	98.2	100.1	97.8	2000.09	98.7	101.9	98.0
1996.10	98.1	100.1	97.7	2000.10	98.7	101.9	97.9
1996.11	98.1	100.1	97.7	2000.11	98.7	101.9	97.9
1996.12	98.1	100.1	97.7	2000.12	98.7	101.9	97.9
1997.01	98.1	100.1	97.7	2001.01	98.7	101.9	97.9
1997.02	98.1	100.1	97.7	2001.02	98.7	101.9	97.9
1997.03	98.1	100.1	97.7	2001.03	98.7	101.9	97.9
1997.04	99.9	102.1	99.4	2001.04	98.7	101.9	97.9
1997.05	99.9	102.1	99.4	2001.05	98.0	101.9	97.1
1997.06	99.9	102.1	99.4	2001.06	98.0	101.9	97.1
1997.07	99.7	102.1	99.2	2001.07	98.0	101.9	97.1
1997.08	99.7	102.1	99.2	2001.08	98.0	101.9	97.1
1997.09	99.7	102.1	99.1	2001.09	97.6	101.9	96.6
1997.10	99.6	102.1	99.0	2001.10	97.4	101.9	96.4
1997.11	99.6	102.1	99.0	2001.11	97.4	101.9	96.4
1997.12	99.6	102.1	99.0	2001.12	97.3	101.9	96.3
1998.01	99.6	102.1	99.0	2002.01	97.3	101.9	96.3
1998.02	99.5	102.1	98.9	2002.02	97.3	101.9	96.3
1998.03	99.3	102.1	98.7	2002.03	97.4	101.9	96.4
1998.04	99.2	102.1	98.6	2002.04	97.4	101.9	96.4
1998.05	99.2	102.0	98.6	2002.05	97.3	101.9	96.2
1998.06	99.2	102.0	98.6	2002.06	97.1	101.9	96.1
1998.07	99.2	102.0	98.6				
1998.08	99.2	102.0	98.6				
1998.09	99.2	102.0	98.6				
1998.10	99.1	102.0	98.4				
1998.11	99.1	102.0	98.4				
1998.12	99.0	102.0	98.3				