UNIVERSITY OF LEEDS
Institute for Transport Studies

ITS Working Paper 443 *ISSN 0142-8942*

October 1995

IMPACT OF THE CHANNEL TUNNEL A SURVEY OF ANGLO-EUROPEAN UNITISED FREIGHT

Results of the Phase I Interviews

G Tweddle
A S Fowkes
C A Nash

This work was undertaken on a project sponsored by the Economic and Social Research Council (Grant Ref: R000234623)

CONTENTS

ABSTRACT

TWEDDLE, G., FOWKES, A.S., NASH, C.A. (1995). Impact of the Channel Tunnel. A survey of Anglo-European unitised freight: results of the phase 1 interviews. *ITS Working Paper 443*, Institute for Transport Studies, University of Leeds, Leeds.

This paper reviews information obtained during interviews regarding the transport of freight between the UK and Continental Europe, immediately before the opening of the Channel Tunnel. The interviews form the first phase of a before and after study to investigate the impact of the Channel Tunnel on freight flows.

In addition to information on firms' movement of freight during early 1994, an interactive Stated Preference exercise was used to determine how firms were likely to react to changes in cost and reliability which may result from opening the Channel Tunnel. This was in addition to the valuing of the through intermodal and Le Shuttle freight services, with cost and reliability held equal to that of the currently used ferry.

From initial modelling, it was found that firms already using Cross Channel ferries on the Dover Straits services required little incentive to change to using Le Shuttle for accompanied road goods vehicles. For vehicles on longer sea routes and for unaccompanied loads the (percentage) incentives required would be greater.

In general the incentive required to switch to the use of through intermodal rail services was twice that of switching to Le Shuttle. This assumed service quality remained constant. Any deterioration in service quality would result in the service not being considered by many firms, except where unrealistically large incentives were offered.

The second phase of the study, to be undertaken in 1995/96 is intended to determine the impact of the opening of the Channel Tunnel on the same sample of firms. The data collected will be compared with the predictions produced by the Stated Preference exercise in order to test the accuracy of the method when used in forecasting. By investigating apparent discrepancies, further modelling work is expected to provide improved estimates of user valuations, and shed light on how best to overcome the scale factor problem for Stated Preference forecasting.

KEY-WORDS: freight transport, forecasting.

Contact: Geoff Tweddle, Institute for Transport Studies (tel: 0113 233 5355)

1. BACKGROUND.

Researchers at ITS have undertaken a study of unitised freight between the UK and Europe, the work having been sponsored by the ESRC. The title of the study is:

Understanding Freight Distribution:
The Channel tunnel as a Case Study.

It was intended that the study should address the behavioural aspects of managers decisions as to how freight is moved with particular reference to choice of mode, quality of service, and route used.

The aims for the project when proposed to ESRC were:

(i) To improve our understanding of the freight mode choice decisions of firms, in a rare context in which major new alternatives become available (Eurotunnel Shuttle and through rail services).

(ii) To monitor the impact of the Tunnel itself, in terms both of the impact on the present ferry ports and on firms' distribution systems and their locational decisions.

ITS also undertook to carry out a validation exercise between the stated preference (SP) and revealed preference (RP) parts of the study.

A survey of manufacturers, international hauliers and freight forwarders has been undertaken prior to the Channel Tunnel being opened to normal traffic. The results of this survey are described in this paper. The survey technique used a combination of orthodox executive interviewing, to determine how firms transport goods to the Continent, and a Stated Preference survey undertaken simultaneously to determine the possible effects of changes in the cost and service levels on the Short Sea routes following the opening of the Tunnel. The second phase of this project will incorporate a second survey of the same sample of companies, once the Tunnel has been in normal operation for over a year. Depending on the response, we have plans to supplement this sample with further interviews, possibly by telephone.

By comparing answers to the questionnaires from each phase of the study, the project should allow us to produce answers to the following:

(a) Provide a RP check on an SP survey and assess the accuracy of the method, as well as suggesting reasons for differential values.

(b) Assess changes in route and modal decisions for European traffic and its impact on the ports and routes to them.

(c) Provide an early indication of locational changes which have resulted from the opening of the Tunnel.

Naturally, many effects may be long term in nature, and so will be outside the scope of a three year project.

The survey concentrates on unitised cargo. This is mainly road goods vehicles either with the driver travelling with the vehicle on the ferry (ARGV) or only the vehicle (often only the semi

trailer) placed on the ferry (URGV). Other unitised methods include rail wagons and lift on lift off (LoLo) cargo mainly consisting of containers and swap bodies.

We excluded cargoes which move in bulk, such as petrochemicals, steel products and some minerals. However, it is possible that a small number of flows of these products may, at some time in the future, be moved direct to the Continent by rail through the Channel Tunnel. Train loads of automobiles already use the Tunnel.

The volume of the UK's international trade which is unitised is about 20% of the total. However, it is the more valuable goods which tend to use such methods of transport (Table 1).

Table 1: UK Seaborne Trade by Mode of Transport 1992 (Thousand tonnes) and Value per tonne

	Total cargo	%	Value (£) per tonne
Total imports	176,438	100	549
Road ro/ro powered vehicle	10,533	6	2,976
Road ro/ro unaccompanied trailer	9,465	5	1,681
Rail wagon	653	0.37	609
Other containerised	15,771	9	1,626
Other	140,016	79	168
Total exports	134,166	100	604
Road ro/ro powered vehicle	6,758	5	4,288
Road ro/ro unaccompanied trailer	6,696	5	1,709
Rail wagon	484	0.36	616
Other containerised	9,944	7	2,054
Other	110,284	82	181

Source: DoT Seaborne Trade Statistics 1992.

In order to reach an understanding of firms' requirements for freight transport between UK and Europe, and whether or not the use of the Channel Tunnel would be either possible or attractive, it was necessary to conduct a series of in-depth interviews with senior managers responsible for making policy decisions regarding international transport. The structure of the interview is designed to gain knowledge of the firms' current pattern of international transport. We then take a 'typical' international flow of in order traffic to assess the valuation of cost, speed and reliability and the impact of the new opportunities offered by the opening of the Channel Tunnel.

These are firstly the 'Shuttle' services operated by Eurotunnel between Folkestone and Calais, carrying complete road goods vehicles on special trains, accompanied by their drivers. This service is in direct competition with the roll-on roll-off (RoRo) ferries operating between Dover and Calais and on many other short sea crossings. Eurotunnel claim that the Shuttle will have advantages in terms of time and reliability, being less prone to service disruption as a result of bad weather.

Secondly, there are two rail based modes. The first of these is rail wagons, possibly forming complete trains, which hitherto have used the train ferry operating between Dover and Dunkirk. In future most of these (those not carrying hazardous goods) will be able to use the Tunnel for direct movement. This should result in fewer delays, quicker crossings and much greater capacity.

The second rail based mode consists of long distance intermodal freight trains carrying containers and swap bodies operated directly from terminals in the UK to those on the Continent. Complete piggyback trailers may be added at a further date. This will allow goods loaded, for example, in Glasgow to be taken by road to a terminal at Mossend, and then be transported by rail to a similar terminal in Milan for delivery by road to an Italian consignee. Until the Tunnel opened, some containers did move by rail to Harwich, for transfer to ferry.

Originally we planned to undertake up to fifty interviews with firms, though in the event thirty four were completed successfully in the first phase of the study of the study. Of the 204 firms contacted, most either did not have suitable flows of traffic or refused to take part. Others agreed to see us only after a delay. Eventually the Tunnel services began to get into full swing, and it was no longer appropriate to continue with the 'Before' survey.

As the 'suitable' flow of traffic had to be capable of using both the Channel Tunnel Shuttle and rail services most hazardous cargo as well as refrigerated goods had to be excluded. Refrigerated services are not currently proposed by the rail companies. Virtually all hazardous cargo is banned from using the Tunnel.

2. SELECTION OF COMPANIES

Firms targeted had to be one of the following: a manufacturer who exported their products; an international haulier, or a freight forwarder handling European traffic. In the case of manufacturers, the source of information was Kompass-Company Information 1989. Addresses of transport operators (i.e. hauliers or forwarders) were obtained from telephone directories for the relevant areas.

The three types of company play a slightly different role in the decision making process regarding the movement of goods to the Continent. Ultimately it is the manufacturer (or in some cases the customer) who determines the service which is required, in terms of transit time and reliability, and how much they are willing to pay for the service.

In general, international hauliers offer a door to door service not only to manufacturers, but also to Freight Forwarders. They generally determine which route will give the user the most cost effective service. Freight Forwarders act as intermediaries, often for firms which have small or irregular flows of traffic and do not have the capacity, knowledge or desire to obtain effective transport services themselves. Freight Forwarders also combine the traffic of several firms in order to obtain lower transport costs.

Of the fifty interviews planned, twenty were selected on the basis that they were known to be large users of European transport services, whether they are manufacturers, freight forwarders or hauliers. The decisions of such companies will influence the volume of traffic using the new European freight services. This represents a 100% sample selection rate for this group. The

balance were selected on a random basis, from small and medium sized companies, as described later.

The sample was concentrated on certain geographic locations thought to be of particular and distinct interest. These are:

(i) London, which generates most of the short sea ferry traffic.

(ii) The West Midlands, whose continental flows are split between short sea and North Sea routes, and where any change in distribution patterns is most likely to show at an early stage.

(iii) The North of England (Greater Manchester and West Yorkshire), which has traditionally used North Sea routes for traffic to northern Europe

(iv) Scotland, whose European traffic follows a similar pattern to the North of England

The last two regions, which have longer transits to continental destinations, tend to use a greater proportion of unaccompanied trailer services.

A breakdown of the sample by type and location is shown in Table 2 below. One potential problem identified at an early stage was that some large firms selected would move freight to or from locations outside the prime areas selected for the sample. This will not be a problem so long as they have some traffic facing the range of choices offered in the SP experiment. A few flows did in fact involve locations outside our intended target areas.

In the case of Freight Forwarders selected randomly, these will be taken from entries in Kelly's Export Services Directory. Taking the total entries therein for each region, this number is divided by the desired sample size. The first firm selected will be in the position given by half that number. For example, there are 14 Scottish Freight Forwarders on our list, and we want to interview two. Initial selection will be 14/2/2 which produces number 3 on the list, while the second selection is 14/2 plus the first number selected (number 10 in this case). Firms not willing to take part will be replaced by the next on the list. When the end of the list is reached we return to the beginning of the list and continue from there until a willing firm is found. When contacted some firms selected prove to have only traffics which cannot use all the options (ferry, Le Shuttle and through rail services), such as hazardous goods. In such cases the firm was passed over. A similar approach was adopted in the case of Hauliers, a list of which was taken from the ABC Freight Guide (Centaur, 1989). Neither of these directories indicate the size of the undertaking or the volume of their European traffic. In order to give effect to our desire to include some large firms, we have chosen such firms directly. This is equivalent to giving them such high weight in the random choice process that they are bound to be chosen. The remaining (small and medium) firms are all given an equal change of being chosen.

Table 2: Sample selection by type of firm and location					
Region	Direct selection	Category Random Selection			Total
		Manufacturers	Freight forwarders	Hauliers	
South East	6	4	3	3	16
West Midlands	6	4	3	3	16
North	4	2	2	1	9
Scotland	4	2	2	1	9
Total	20	12	10	8	50

The regional breakdown was intended to permit examination of the effect distance from the Channel would have on decision making. However, in many cases the flows of traffic proved to be remote from the base location of the firm. For instance, one firm based in the South East provided as its typical European traffic flow a flow of automotive components from Poland to a factory in the North of England, which formed part of an integrated 'just in time' production process. Nevertheless, a good balance of flows from the targeted regions was obtained (see Table 3), using various methods of transport and sea routes with Accompanied RoRo traffic concentrated on the Dover Straits corridor.

The flows of traffic examined also represented a wide selection of commodities. They included semi finished steel products worth £238 per tonne to consumer goods worth £34,407 per tonne, and the values of road vehicle loads ranged from £5,000 to £516,104. The volumes per month varied from 80 kilos of specialist valves to Holland to 120 trailer loads of glass from France. In terms of European operations undertaken by the firms interviewed (as opposed to just the typical flows), the volumes of trade varied from less than 1 tonne per month to an operator importing 1055 tonnes per month in addition to 273 trailer loads.

Table 3: Structure of the Sample Flows								
Region	Category						Total	
	Manufacturers		Freight forwarders		Hauliers			
South East	2	(1)	3	(1)	7	(3)	12	(5)
West Midlands	3	(3)	3		2	(1)	8	(4)
North	3	(1)	2	(1)	2	(1)	7	(3)
Scotland	4	(2)	1		2	(2)	7	(4)
	12	(7)	9	(2)	13	(7)	34	(16)

Note: Firms selected directly shown in brackets

2.1 POSTAL SURVEY

The original proposal for the Channel Tunnel study was to undertake a postal as well as an executive interview survey. The postal survey of freight forwarders and international hauliers had a target of 100 usable responses and was intended to obtain a broad base of data on the movement of goods between the UK and the Continent during 1993/94, prior to the opening of the Channel Tunnel. The original plan was to undertake a second survey, either postal or telephone, of the same firms to enquire how freight patterns had changed during the period between 1993 and 1995.

The postal survey was concentrated on firms in the same geographical areas as those for the interviews, London, West Midlands, West Yorkshire/Greater Manchester, and Scotland. As responses from the postal survey were also intended to provide information for the selection of firms to undertake lengthy executive interviews, it was decided that in order to avoid any conflict a pilot postal survey would concentrate on areas other than those which were to be used for the interviews. Areas selected for the pilot postal survey were Bristol and Somerset (predominately Taunton), plus freight forwarders based in south east London. Given the negligible response to the pilot survey this was a sensible decision as firms eventually selected to be approach for an interview had not formed a pre-determined view of whether or not they should take part.

Companies were selected for the postal sample using the same two sources as those which were interviewed. The questionnaire was developed so that respondents would provide information on their traffic moved to and from various countries in Europe during 1993, the route or routes taken, and the mode used. These were to have provided information on the corridors on which the Tunnel was most competitive. In addition the quantity of hazardous and groupage traffic was requested.

Apart from quantified data, two questions relating to the quality and cost effectiveness of the proposed Tunnel services were included. One asked to which countries traffic would use the Le Shuttle services if a 10% saving could be obtained compared to the ferries. Another asked respondents to rank a number of service attributes related to inter modal transport.

During mid-January 1994 pilot survey questionnaires were despatched, 30 to forwarders and hauliers in Bristol and Somerset, plus 20 to forwarders in south east London. Very few replies were received. Two stated that the firm was in receivership, and another three demonstrated that the firms concerned did not have traffic to Continental Europe.

In order to determine the reasons for the lack of response half a dozen firms were contacted by phone. The primary reason for not completing the questionnaire was lack of staff time.

Three companies did supply more detailed reasons. One forwarder said they might have completed a much simplified form giving only the number of units by route. One large forwarder stated that apart from staff time, as the company was organised in the form of departments for various countries, the form would have to travel around the office. However, this company did agree to be interviewed. Another large company said they, like many others, had been inundated with questionnaires regarding the Tunnel and completed very few. They gave priority to student training, preferably of the work related type rather than information for market research.

Given the extremely disappointing results from the pilot survey, and the clear indication that firms would not respond in sufficient numbers, this method of gaining data was abandoned in Phase I.

This resulted in Phase I of the study being entirely reliant on the limited number of in depth interviews.

Nevertheless, preparation for distributing the questionnaires produced lists of companies in the forwarder and international haulage sectors. These were used as the basis for generating part of the random sample to be interviewed as part of the SP experiment. The balance of the sample being generated from an additional list of manufacturing exporters.

3. THE INTERVIEW QUESTIONNAIRE

The interview questionnaire, see appendix 1, can be divided into two parts. Initially the interviewer needs to establish the background of the manufacturer or operator and the distribution methods used. From this information a number of regular international movements can be identified, and one of these is then chosen as a typical and representative example of the companies distribution network.

In the second part of the interview, the chosen flow is examined in greater detail to gather information on choice of mode (and the reasons for such a choice), the density and packaging of the product as well as the value and distribution costs of the goods. The trunk movement cost is then used as an input for the stated preference exercise the interviewee will be asked to undertake.

4. RESULTS OF THE SURVEY

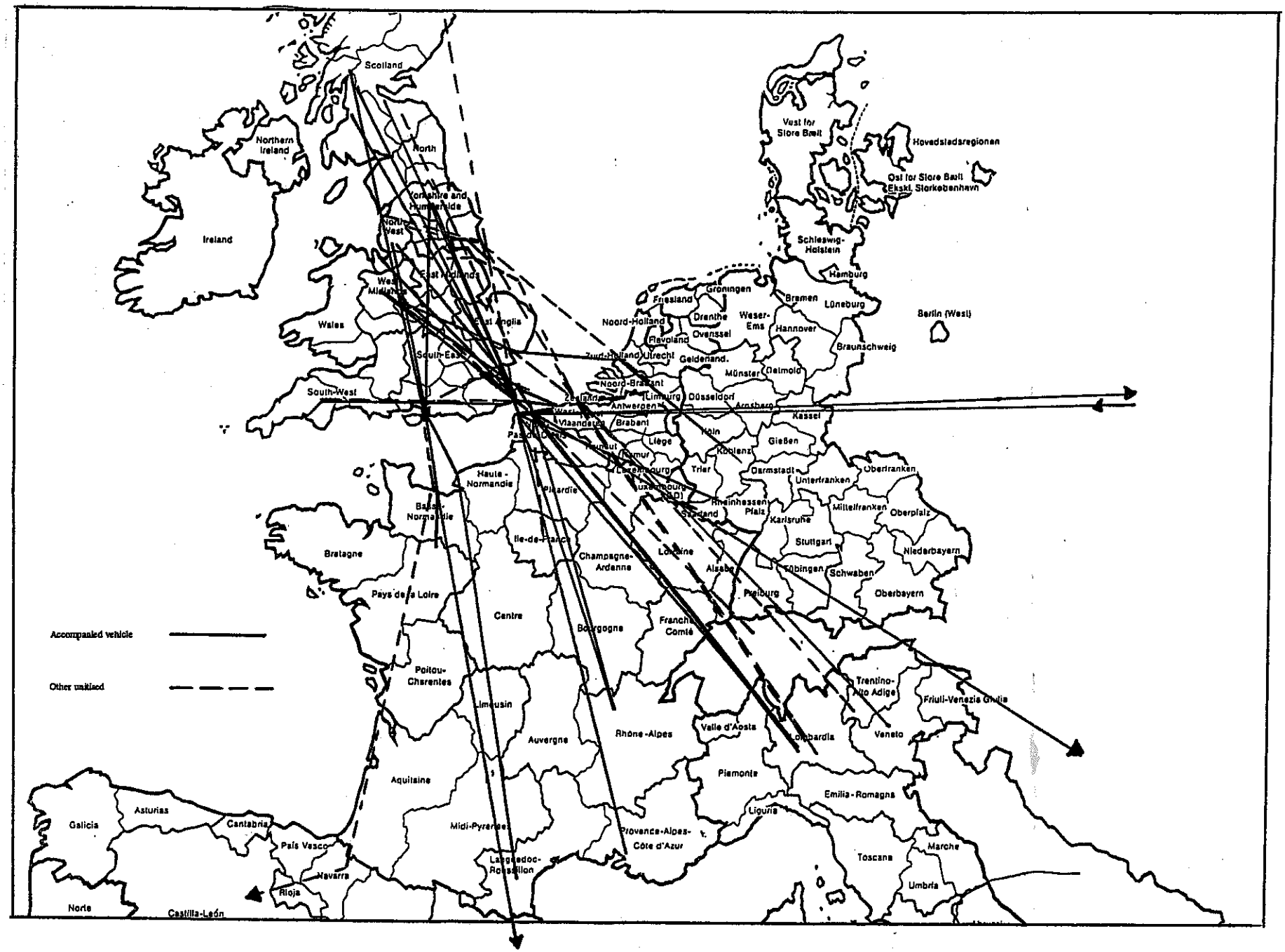
As in many spheres of transport, results from the survey indicate that while there are a large number of operators engaged in transporting goods between the UK and Europe, it is the decisions of the larger companies in terms of choice of route, equipment and mode, which will determine the success of Channel Tunnel. Many small operators, particularly hauliers, act as subcontractors to the larger companies.

Firms which were interviewed used all the main methods of shipping to the UK except semi bulk or conventional shipping, and built vehicles. The combined monthly flows are shown in Table 4 together with the mode split for UK exports to Europe in 1991 (DoT, 1993b).

Table 4: Weighted Monthly Flows of Sample Firms and comparison with UK exports, by mode

Mode	Volume/month	Tonnes/month	Sample %	UK Exports 1991 %
ARGV	620 trailers	7440	20	22
URGV	76 trailers	1216	3	16
LoLo	106 teu	2226	6	10
Rail	2,000 tonnes	2000	5	1
Bulk	24,500 tonnes	24500	66	52
Total			100	100

Figure 1: Traffic Flows in Samples



4.1 QUALITATIVE RESPONSES FROM INTERVIEWEES.

A number of qualitative factors were determined during the interviews, while results from the Stated Preference exercise related to these typical flows are used to determine the effects of changes in services and costs. The initial qualitative data collected indicated a wide variety of service requirements within the sample.

In general it was found that large manufacturers tend to use a variety of routes and methods for international traffic. This allows them to satisfy the specific delivery requirements of individual customers or products at minimum costs. Nevertheless, the predominant method for most manufacturers interviewed was the use of accompanied road goods vehicles (ARGV). In most cases, this was the method used for the 'typical' flow.

The lower cost methods, notably unaccompanied road goods vehicle (URGV), or lift on lift off (LoLo) tended to be used for the movement of lower value commodities moved in relatively large volumes. There were exceptions to this. One operator was using URGV operation to move automotive parts between the UK and Iberia as part of joint production system. In this case the number of trailers to be moved allowed drivers to meet the ferries on each side of the Channel. Rail and bulk shipping were used by three companies in each case for the movement of intermediate bulk products within the production chain.

Six interviewees stated that their companies either used, or had tried, the intermodal rail services available on the Continent. There was general dissatisfaction with the quality of service offered in terms of transit time and reliability.

These qualitative comments were confirmed by two LoLo flows examined in detail. They were both moved to a UK port by road, but by rail for the continental trunk haul, with final delivery by road from a terminal. The overall transit times were one or two days longer than for ARGV on the same route, and on time arrival at the customer was between 90% and 95%, compared with 95% to 98% on time reliability for full load ARGV operations.

The 34 successfully completed interviews were undertaken during the period the Channel Tunnel freight services were beginning trial operations. As the study progressed, more hauliers in particular had used the limited Shuttle services offered. However, they were asked to answer the SP experiment on the basis that their experience of the Shuttle would not influence their replies.

Most seemed to comply with this request. The general view was that the Le Shuttle service would provide greatly increased capacity on the Cross Channel routes, it should be a little quicker than the ferries (especially in bad weather) and there was less likelihood of delay during holiday periods. However, they were unwilling to pay the premium being asked by Eurotunnel.

Rates charged by the ferry companies during 1994 could be described as being 'fluid' with many operators being granted unprompted reductions in rates as the Eurotunnel services commenced operation. One haulier stated that during the first half of 1994 rates for his vehicles using the Shuttle had fallen from £310 to £280, while those for his regular ferry crossing had declined, from £250 to £220. He had obtained a spot booking on one ferry of £170.

The situation regarding the through rail intermodal services was different, partly because they were later to start operations. Only two interviewees had used intermodal services through the

tunnel. Only the largest hauliers and freight forwarders were considering the purchase of equipment, notably swap bodies, in order to offer an intermodal service to their customers.

None of the manufacturing companies interviewed had been offered the option of sending their goods intermodally by a haulier. However, Haulmark - the international division of Freightliner - was negotiating rates with several manufacturers in the sample.

The method used to sell space on intermodal trains is through two wholesaling companies. Combined Transport Ltd (CTL) and Allied Continental International (ACI). They sell terminal to terminal slots on the trains to hauliers, who in turn offer to move traffic door to door. This means that the railway companies are very remote from the ultimate customer. The customer is left pondering who is going to look after his consignment.

These views indicate that intermodal rail services will have to generate a proven performance record which is better than that achieved currently on the Continent if they are to win road based traffic from the UK, where consignors are unwilling to tolerate low quality services.

In the case of classic rail wagon load movements (door to door by rail) the attitude was somewhat different. The few firms who do use classic rail wagon services currently using the Dover-Dunkirk train ferry 'Nord Pas de Calais' had no objection to the traffic being diverted through the tunnel, provided this did not increase costs, a fact which was reflected in their responses to the SP exercise. If the railway companies impose a premium, some of these flows may be lost. They are mainly low value bulk commodities, and an increase in transport costs may result in the consignee changing the source of supply.

Another issue for operators, rather than manufacturers, is the extent of diversion from the current route required in order to use the Channel Tunnel. For example, a haulier offering a daily service from the north of England to Iberia via the Portsmouth-Caen ferry would have to increase the number of vehicles in the system in order to use the Shuttle services. The Dover Straits option must offer significant discounts in order to become attractive, even if overall transit times were to remain acceptable to customers.

Restrictions on the movement of hazardous goods reduces the potential market for the Tunnel by a greater percentage than the volume of hazardous goods. This is mainly due to the presence of groupage traffic; only a small proportion of such a load may be hazardous, but this means that the whole load is treated as hazardous.

Many operators carrying hazardous cargo only carried small amounts of such goods as part of a groupage service. However, because of the desire to move trailers to each destination on a regular basis, it was not practical to send hazardous consignments separately. In any case, regulations restrict whether certain types of hazardous goods can be loaded on the same vehicle. As a result an operator whose traffic contains 5% of hazardous consignments may spread this traffic across 20% or 25% of vehicles despatched.

In overall terms road hauliers seemed to be providing a range of services from which manufacturers and forwarders could choose a satisfactory and cost effective service. This applied to both the accompanied and unaccompanied methods. However, some consignors who were back

loading returning Italian vehicles (out of the UK) were dissatisfied with the service they received, and possibly would be more likely to change mode. However, they were paying low rates.

The attitude of hauliers and forwarders was that there would be little to choose between placing an ARGV on a ferry, or using the Shuttle services, in terms of time and quality. As a result, the Eurotunnel Shuttle services will win a slice of the ARGV traffic, the size of the slice depending on the rates charged.

There appeared to have been a deliberate policy on the part of Eurotunnel to target road transport operators who offered express services. The reasons for such a policy are twofold. Firstly, this type of operation is more sensitive to both time and reliability constraints, and the operators possibly more willing to pay a premium to gain the service they require. Secondly, the scheduled despatch pattern of the such services means that they can be booked on specific Shuttle trains each day of the week.

Eurotunnel's success in gaining express road freight is shown by the fact that one such operator, Securicor Omega, has curtailed its air freight movements to the Continent. The firm now sends about 140 vehicles per month using Le Shuttle freight services.

4.2 RESULTS FROM THE STATED PREFERENCE EXERCISE

Stated Preference methods were adopted in order to estimate the values placed by users on the possible changes in the services offered using the Channel Tunnel. In particular, an estimate was required of the change in total cost of transport which would induce users to switch to a mode of transport using the Tunnel, all else equal. This is called the mode specific constant. In addition, valuation of possible changes in service levels were investigated, namely changes in transit times and reliability.

The percentage that total freight charges would be required to be reduced in order for users to switch to either Le Shuttle or through rail services is shown in Table 5. It appears that a discount averaging some 5% is needed for firms to switch to the shuttle, whereas something nearer 10% is needed for through rail, though with big differences by type of firm, region and country. It should be noted that the cost of movement through the Tunnel forms only a part of the overall freight charges. For example; in the case of a movement from the Midlands to the Ruhr the cost of using Le Shuttle would form about one third of the total, whereas for a load from the North West to Northern Italy, Le Shuttle charges may constitute 17% of the total.

In terms of switching modes, the tariffs for using through rail modes will need to be much lower, all else equal, than for Le Shuttle. Traffic imported to the UK appears to have a much greater propensity to switch to using the Tunnel than do exports. Manufacturers were much more cautious about using Le Shuttle than were freight operators. Not surprisingly, hauliers were particularly reluctant to use through rail (Intermodal) services. This probably reflects the view that they would have to purchase new equipment and introduce new management and operating systems.

There was little resistance to switching from ferry to Le Shuttle for flows which currently use accompanied road via the Dover-Calais route and this forms the main area of competition. Users of the North Sea routes showed much greater reluctance to divert to use the Tunnel.

Table 5: Mode Specific Constants (% off ferry freight rate all else equal).			
	Eurotunnel Le Shuttle (%)	Through Rail Services (%)	Sample size
Whole sample	4.8	9.1	34
Category of Firm:			
Manufacturers	12.2	15.4	12
Hauliers	2.6	17.4	13
Freight forwarders	0.1	5.8	9
Mode:			
Accompanied road	4.8	30.4	25
Unaccompanied road	9.6	12.8	6
Rail	0.1	1.3	3
Direction:			
Imports	0.1	4.2	5
Exports	8.3	17.4	29
UK Region: (Exports)			
Scotland	13.1	15.4	6
North of England	4.8	-0.8	9
Midlands	15.5	30.4	7
South East	2.6	17.4	5
European Country:			
Holland	0.1	1.3	4
Germany+Switzerland	2.6	17.4	6
France	2.2	9.1	7
Italy	12.2	30.4	12
Sea route:			
Dover-Calais	2.2	17.4	10
Other Dover Straits	8.3	12.8	12
North Sea	15.5	30.4	4
South Channel	1.8	66.7	3

In Table 6 the valuations of service attributes are presented. Many operators do allow a limited amount of time in their schedules to overcome delays of various types, so the value of a shorter transit time depends on whether or not this time can be used effectively. For example, an operator is likely to make more cost effective gains from a vehicle arriving at its destination at 1500 instead of 1700 compared to one arriving at 1900 instead of 2100 hours. Changes in time units are based on 2 hour differences during the day or 4 hour differences at night.

Changes in reliability were valued as a 1% change in the consignments arriving on time. Reliability was valued very highly. Generally operators had little option to reduce the level of reliability as customers were generally placing them under increasing pressure to improve on time delivery. This is in part the result of the continuing introduction of Just-in-Time production methods and the general desire to minimise inventories.

The valuation of changes in transit times was more consistent across the various categories measured, though it is clear that, within the sample, exports are more time sensitive than imports. The length of haul also influences the value of transit time, which generally increases with distance, though the high values for flows on North Sea routes may be indicative that the drive towards reducing inventories in Northern Europe is more advanced than in the Mediterranean region.

Changes in the level of reliability produced the largest valuations given that they are for a single percentage point change in on time delivery. If using one of the Tunnel based modes reduced reliability by 2% compared to ferry, then the overall freight rate door to door would have to be reduced by over 10% in order to remain equally attractive in terms of generalised cost. Again the valuation for exports far exceeded imports while, with the exception of Italy, there was a tendency for long distance flows to produce higher valuations.

Table 6: Valuation of Service Attributes (% change in freight rate)

	Per Time Unit (%)*	Per 1% Late Arrival (%)	Sample size
Whole sample	4.9	-5.3	34
Category of Firm:			
Manufacturers	7.4	-6.4	12
Hauliers	3.8	-4.1	13
Freight Forwarders	6.1	-0.3	9
Mode:			
Accompanied Road	7.4	-5.3	25
Unaccompanied Road	6.1	-12.1	6
Rail	2.3	-3.3	3
Direction:			
Imports	2.8	-1.6	5
Exports	6.1	-6.4	29
UK Region: (Exports)			
Scotland	9.8	-7.7	6
North of England	3.5	-8.9	9
Midlands	7.4	-6.4	7
South East	3.8	-4.1	5
European Country:			
Holland	2.3	-3.3	4
Germany+Switzerland	2.8	-4.1	6
France	4.9	-9.2	7
Italy	7.4	-5.3	12
Sea Route:			
Dover-Calais	3.8	-4.1	10
Other Dover Straits	6.1	-5.3	12
North Sea	7.4	-6.4	4
South Channel	4.9	-9.2	3

Note: * A unit of time is 2 hours between 0700 and 1900, then 4 hours at night; hence there are 9 time units per day.

There was substantial consistency between the qualitative and quantitative answers given by the interviewees. Both parts of the interviews indicated that the Shuttle services would be accepted as an alternative to the ferry, especially for traffic on the Dover Straits corridor. Current rail users also accepted the diversion of traffic through the Tunnel as an alternative to the rail ferry operation from Dover to Dunkirk. Intermodal rail services received more scepticism. Not only did interviewees require larger discounts to use the technology, but they questioned whether rail could deliver the same quality of service as road. If they can not, unrealistically, large discounts would be needed before most customers would switch.

5. CONCLUSIONS FROM THE INTERVIEWS

A number of inferences can be drawn from comments made by managers controlling European freight movements. With regard to Accompanied Road Goods Vehicle traffic:-

- Operators are pleased to have an alternative, which increases capacity on the Dover Straits corridor.

- In overall terms the time savings are thought to be small.

- A reliable service in bad weather, and capacity at holiday periods appears to be the greatest benefit.

- Few operators are willing to pay a premium to use the Shuttle, and few will consider diverting from South Channel or North Sea ferry services.

The intermodal rail services offer new opportunities, particularly for British Rail's Railfreight Distribution. However, there seems to be a number of qualifying factors:-

- Consignors are concerned about what they regard as poor performance by the existing services on the Continent, and by who will ensure that service quality is maintained.

- Those operators using the intermodal services on the Continent will add the UK terminals to the network, for use by what they consider are suitable traffics.

- Flows of low value goods or those which do not require high quality services, are more likely to be attracted to intermodal services, as they are in mainland Europe.

- Very few hauliers seem willing to invest in the specialist equipment required to offer inter modal services.

- Some consignors who were back loading returning Italian vehicles were dissatisfied with the service they received, and possibly would be more likely to change mode. However, they were paying low rates.

The few firms who do use classic rail wagon services currently using the Dover-Dunkirk train ferry 'Nord Pas de Calais' had no objection to the traffic being diverted through the tunnel, provided this did not increase costs. If the railway companies impose a premium, some of these flows may be lost.

On the other hand, through rail could possibly win a small amount of traffic from bulk shipping, notably in the field on low hazard chemicals and metal products. However, such traffic tends to be cost sensitive.

In overall terms, the Eurotunnel Shuttle services will win a slice of the ARGV traffic, the size of the slice depending on the rates charged. A small discount on ferry rates would be enough to secure a substantial market share. Even given a 10% discount on road rates, intermodal rail services will have to generate a proven performance record which is better than that achieved currently on the Continent if it is to win significant volumes of road based traffic from the UK, where consignors are unwilling to tolerate low quality services.

There appeared to have been a deliberate policy on the part of Eurotunnel to target road transport operators who offered express services. The reasons for such a policy are twofold. Firstly, this type of operation is more sensitive to both time and reliability constraints, and the operators possibly more willing to pay a premium to gain the service they require. Secondly, the scheduled despatch pattern of the such services means that they can be booked on specific Shuttle trains each day of the week.

6. EFFECTIVENESS OF PHASE I OF THE STUDY

The major problem encountered has been that a large number of firms were unwilling to take part in the study. The postal survey was completely unsuccessful, while the interviews had to be curtailed due to low response rate and delays in obtaining interviews.

Nevertheless, those firms who did take part gave a high degree of cooperation. As a result both the qualitative and quantitative data collected gives an adequate representation of Anglo-European freight traffic at the beginning of 1994, before the Channel Tunnel opened.

The software (LASP) developed for use in the Adaptive Stated Preference exercise worked well. Estimates were obtained for mode specific constants, as well as for changes in service quality.

We look forward to gaining information from the firms taking part in the survey regarding their European traffic during the latter part of 1995. The data obtained will be used to assess the effectiveness of using interactive SP techniques. This will be in addition to determining the initial impact of the opening of the Channel Tunnel.

7. PLANNING PHASE II OF THE CHANNEL TUNNEL SURVEY.

Before commencing interviews the researchers need to take stock, and decide what information they should obtain as part of phase II. The correspondence between the qualitative and quantitative parts of the interview in phase I suggests that the methods used are reasonably robust.

The questionnaire used in phase I was split into two parts, the first dealing with the firm's Anglo-European traffic in general, while part 2 concentrated in detail on a typical flow which would be able to use the Channel Tunnel services. The typical flow was then used as the basis of the SP experiment.

Referring to our objectives, given on p2, in order to cover (i) and most of (ii) above, the simplest method is to repeat parts 1 and 2 of the phase I questionnaire. This will allow changes in the overall European flows to be assessed, both in terms of routes and volumes as well as examination of the effect of the Tunnel on the ferry ports.

The most important data for the comparison of the SP and RP will be the current costs and mode choice for the typical flow, provided it still operates. Not only will relative costs and service of various modes on the Dover Straits route become apparent, but hopefully examples of diversion from longer crossings may indicate the effect of reduced rates influenced by the introduction of Tunnel services.

Assessing changes in firms locational decisions may prove more difficult. It requires additional questions during the phase II interviews asking whether any such changes have occurred or are planned as a result of the Tunnel.

By comparing answers to the questionnaires from each phase of the study, the project should allow the researchers to satisfy the objectives of the project as spelled out - section 1.

Clearly, even if all the 34 Phase I respondents agreed to take part in Phase II, and if all the typical flows still operated, this would still leave us with a very small sample for our RP-SP comparison. Accordingly, we are evaluating the possibility of carrying out some further RP and SP interviews, where we ask firms to think back to give us the 'Before' RP information, and also some telephone or postal interviews, again seeking recall information in areas of our sample frame that look interesting, but for which our sample is otherwise inadequate.

Of particular interest will be an examination of the extent to which our SP models will be capable of forecasting what has actually happened. Technical arguments will be considered such as the scale factor problem. This arises when using SP models for forecasting since the 'errors' made by respondents to SP exercises may be greater than those in real life, causing the SP forecast to err towards the 'equal shares' position.

REFERENCES

Centaur (1989). *ABC Freight Guide 1989-90.* Centaur Communications, London.

Department of Transport (1993a). *Seabourne Trade Statistics 1992.* DoT, London.

Department of Transport (1993b). *The Origins, Destination and Transport and Transport of UK International Trade 1991.* DoT, London.

APPENDIX

U.K. Europe Freight Route Choice Survey

Questionnaire:- Interviewer:- Date:- No:-

Part 1 - Background Information.

1. Company Name:- Interviewee:-

Position

Telephone

2. UK-European traffic per month (determine units)

a) Imports ..... b) Exports .....

c) % Cross Channel (Bel. to Dieppe) ..... d) % North Sea .....

e) % South Channel (w. of Dieppe) ..... f) % Hazardous .....

g) % European traffic/market .....

3. Most important European flows (O/D, volume, commodity, method)

a)

b)

c)

Do any use Cross Channel routes? .....

4. Current methods used for transport of European traffic

a) Accompanied RGV% ..... e) Rail% .....

b) Unaccompanied RGV% ..... f) Other% .....

c) Lo Lo% .....

5. Has your company negotiated

a) rates for Le Shuttle movements y/n b) for through rail services using the tunnel y/n

Part 2 Details of a European flow which could possibly use Channel Tunnel services.

6. Route

a) Origin ..... b) Destination .....

c) Sea route ..... d) Method (ie LoLo) .....

e) Volume ..... f) Cost/Unit .....

g) Distance (m/Km) .....

7. Commodity information

a) Type of goods ..... c) Consignment weight .....

b) Value/unit ..... d) Consignment volume .....

e) Is vehicle weight or volume constrained (W/V) .....

8. Service requirements :-	Current method	Tolerance
a) Departure on day A		
b) Arrival time and day		
c) Reliability (% on time)		
d) Restrictions		

Part 3

9. Stated preference exercise.

a) Demonstrate initial screen layout, and explain difference between the four options. Purpose is to examine process of " trade-offs " between options.

b) Define the following:-

i) Cost related to flow under examination, but options only provide a variety of "imaginary " services.

ii) Delivery times. Day A is day of loading, 9 am C represents delivery on the morning of third day, 3 pm C would be the third day after lunch.

iii) Reliability, related to the delivery time, thus 80 means 8 out of 10 deliveries arrive on time; the balance being delivered within the next three days. (see page)

iv) Le Shuttle means the haulier transfers the road vehicle to rail for the journey through the Channel Tunnel.

v) The current service has been given a rating of 100. Please rate other options on a scale whereby if they are equal in quality but half the cost, then the rating should be 200. If the quality is equal but twice the cost, then the rating should be 50. When all four have been rated, the most attractive alternative should have the highest rating.

c) When the ratings have been accepted, the program will recalculate the options to be offered in the next iteration. The options found least attractive will be improved, and those rated more highly will be made less attractive.

d) The process of iteration does not have a natural conclusion. Normally about eight interations should be sufficient for our purposes.

Reliability Rates.

Per-centage Delivered:-

On Time	By 6 Hours Late	By 12 Hours Late	By 36 Hours Late	By 2 Days Late	By 3 Days late
100	100	100	100	100	100
99	100	100	100	100	100
98	99	100	100	100	100
97	98	100	100	100	100
96	97	99	100	100	100
95	96	98	100	100	100
93	95	97	100	100	100
90	93	96	100	100	100
87	90	95	99	100	100
85	87	93	98	100	100
80	85	90	97	100	100
75	80	87	96	100	100
70	75	85	95	99	100
60	70	80	93	98	100
50	65	75	90	97	100
40	60	70	85	96	100
30	50	65	80	95	100
20	40	60	75	93	100
10	30	50	70	90	100
5	20	40	60	85	100
0	10	30	50	80	100