Focus on **Combined Transport**

English edition

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Combined transport (CT) can be defined as the combination of at least two modes of transport in a single transport chain, without a change of container for the goods, with most of the route travelled by rail, inland waterway or ocean-going vessel, and with the shortest possible initial and final journeys by road. This brochure is devoted mainly to rail/road CT. A characteristic feature of CT is that it links the advantages inherent in two modes of transport. These are on the one hand the efficiency of rail transport in moving bulk freight, making it ideal for long-distance operations, and on the other hand the unrivalled advantages of the lorry in bulk- and distribution transport over short and medium distances. CT also meets increasing demands for environmentally friendly transport.

Unaccompanied transport

The most common form of CT is transport with containers, swap bodies and semi-trailers. This unaccompanied transport, in which only the loading units are transported by rail, has a market share of around 80%. If transport of maritime containers by inland rail is included, the share is as high as 90%.

Major technical, organizational and infrastructure preparations are, however, required for unaccompanied transport. For road hauliers and freight forwarders this means in particular that they must have special loading containers which are «craneable», i.e. which can be loaded with a mobile or gantry crane. This is called vertical transshipment. Road vehicles with swap bodies and semi-trailers cost somewhat more than «normal» vehicles. A haulier must also ensure that the container is collected at the destination terminal and is delivered to the final destination. Many hauliers, including medium-sized firms have extended their operations at the «other end» either by setting up their own offices or by finding reliable partners who will assume responsibility for local delivery by lorry.

Accompanied transport

In accompanied transport, the complete lorry drives over a ramp under its own power onto a special low loader wagon. This is called horizontal transshipment. During the journey, the driver remains on the train, accompanying his lorry in a separate, comfortably equipped wagon (couchette car). At the destination terminal the driver once again takes charge of the vehicle combination and is able to continue his journey to the customer. The advantage of this is that the driver can rest during the journey. In a number of countries the time spent during this form of rail transport is recognized under the law as a break in accordance with the rules on driving hours and rest periods. Another advantage is that working conditions are improved because night work is no longer required.

Rolling Motorway trains can be loaded and unloaded in a relatively short space of time. The RoMo has proved to be a great success in trans-Alpine traffic and is called for where combined transport is to be operated within a relatively short preparation period. It is also ideal for road hauliers who have not yet acquired great experience in handling CT. What is of particular importance is that no special retrofitting or adaptation of an existing fleet is required in order to operate transport on a RoMo, and RoMo transport does not require any expensive infrastructure preparations (terminals). This form of transport is therefore especially

suitable for short and medium distances (200 km to 400 km) and where fast train turnaround times are required.

To sum up, it can be said that the RoMo technique could be the trailblazer for CT for all the countries of Central and Eastern Europe. However it can also be said that where there is light there is also shade. The most obvious drawback of the RoMo is its especially heavy «dead weight», as, in addition to the shipment, the weight of the full lorry also has to be transported by rail. Where terminals are already available, accompanied transport fares worse than unaccompanied transport as regards economic efficiency.

Rolling stock

It is not only road hauliers who are investing in CT. Rolling stock is also essential. The European railway undertakings now have several thousand special wagons suitable for the transport of the various types of containers. Very many CT companies also have extensive stocks of private wagons. A RoMo train requires wagons which are of a different type from those used for the transport of containers and swap bodies. On the other hand, with so-called pocket wagons it is possible to transport semi-trailers in addition to swap bodies and containers.

Terminals

Additional preparations are, however, required for unaccompanied transport. For transport containers to be moved, suitable transshipment equipment must be available. In most West European countries a dense network of terminals has now been established and is being upgraded. This does not mean, however, that a terminal will require a multi-million investment. In many cases an investment of up to ECU 3 million will be enough to create the nucleus of a CT transshipment operation. Entry into the business is possible with one mobile crane. Larger terminals usually work with gantry cranes.

Operators and railway undertakings

Cooperation with various partners is vital for combined transport. The railway undertakings provide their operating systems, i.e. the rail network, locomotives and personnel required for transport operations. The operators purchase rail traction from the railway undertakings. Around one half of the wagons used in CT are procured through the railway companies, while the other half is procured through operators. As far as terminals are concerned, these are operated by both the railway undertakings and operators including private local ones. The operators prepare their range of services on this basis and market either a complete transport chain for shippers or terminal-to-terminal services for road hauliers and freight forwarders.

The railway companies and their subsidiaries originally concentrated their efforts on the maritime container business. In addition to mainly domestic marketing companies such as Compagnie Nouvelle de Conteneurs (France) and Transfracht (Germany), the European railway companies jointly formed the company called Intercontainer, to which they gave the task of organising and marketing international container rail transport. The company, which has its headquarters in Basel, merged in 1993 with the railway subsidiary for temperature-controlled freight transport to Intercontainer-Interfrigo (ICF). Operating in competition with hauliers and freight forwarders in European inland transport, the container companies offer shippers the entire combined transport chain for land containers: the initial journey by road, the main journey by rail and the final journey by road. During the past few years, terminal-to-terminal services with swap bodies and semi-trailers have also been offered to an increasing extent for road hauliers.

The formation of combined transport companies structured on cooperative lines originated with an initiative by freight forwarders and road hauliers and their organisations. Each of the national railway undertakings holds only a minority participation. Well over 1,000 freight forwarding and haulage firms, most of them of medium size, have now joined the seventeen combined transport companies which came together in the «Union Internationale des sociétés de transport combiné Rail-Route» (UIRR). Many of them have invested heavily in CT. The UIRR companies organise and market terminal-to-terminal services by rail. It is the road haulier who acquires the traffic, arranges for the short haul from the shipper to the terminal with his own vehicles and, either on his own account or through contractual partners, collects his loading units again at the destination railway station and delivers them to the consignee. It is the hauliers and freight forwarders themselves who continue to be the carriers, who invest in the swap bodies and craneable semi-trailers for combined transport, who participate in the UIRR companies, and who are actively involved in this manner in the development of combined transport. Organised cooperation between road- and rail transport is the main reason for the great success achieved by the combined transport companies.

There are also a number of other private hauliers who, in parallel with the groups of providers referred to above, operate combined-transport services on their own account either on certain routes or for specific categories of goods, e.g. chemicals and liquid products requiring tanker transport. Such operators also offer CT train capacities to third parties on the market. It can be assumed that there will be additional operators in the future.

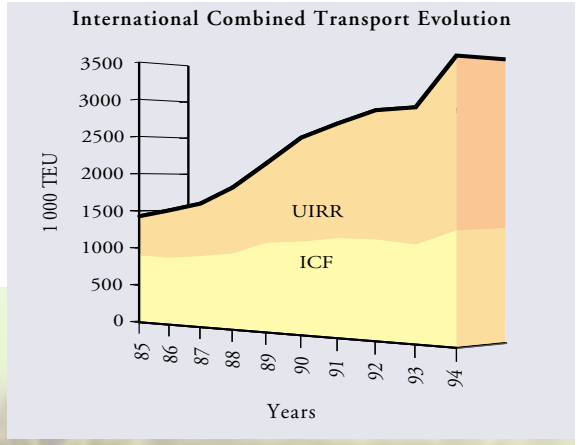
Further liberalisation is also taking place in the rail transport market. A change is now taking place as regards the traditional main categories under which maritime containers were transported by the container- and railway companies, while road vehicles and their loading units were transported mainly by the combined transport companies. All operators are now seeking to enter every available market. Complicated questions arise, however, in this connection under competition law, as when, for example, the UIRR companies now compete with their monopoly suppliers, the railway companies. The present monopoly held by the railway companies will be restricted in the future.

The state-operated railways are being privatised in most European countries. EU Directive 91/440 on railway undertakings obliges all EU Member States to reduce railway company indebtedness and to establish a management structure independent of the State. Two key measures will change the entire rail transport environment. The Member States must make the relationship between rail operation and infrastructure management transparent. An accounting separation between both areas is obligatory, while a more extensive structural separation is optional. The traffic operations of the railway companies will have to be conducted like

those of a private-sector undertaking operating in the market, while the rail network will be managed separately on behalf of the national governments. The latter will then bear the financial infrastructure burdens and collect user charges which will be set according to distance, train composition and other criteria (e.g. speed and axle load).

In the field of combined transport, each railway undertaking (including each newly formed private railway undertaking) obtains free access to the entire EU rail network. CT is therefore in a special situation, as it is initially envisaged that, for other freight and passenger traffic, only groups of railway undertakings can use the rail infrastructures linking their countries of origin.

We are entering a new era in rail transport in Europe. While the general direction can be discerned, nobody can predict today how tomorrow's railway market will look. One thing is, however, certain: in the course of this development, combined transport will play a key role in freight transport.



The road hauliers' view

CT is well known to be an environmentally friendly form of transport. However in itself this consideration will lead only a very small number of road hauliers to make use of this form of transport. As in the past, the shippers do not award any «environmental bonuses». For a transport undertaking the chief consideration therefore is the specific commercial value offered by CT. However any person who seriously examines the pros and cons of CT will readily ascertain that it offers specific advantages for his business. And of great importance in any such assessment is the transport- and operational structure of the individual haulier.

Whether accompanied or not, CT helps a haulier to reduce variable costs relating to fuel, tyres and repairs. Lorry life is extended. The size of the fleet can be effectively reduced if a haulage firm invests in appropriate equipment which can be used in CT. Traction vehicles and road trains used only in the initial and final journeys to and from terminals will then be able to move a larger number of swap bodies and craneable semi-trailers.

Neither should the potential for savings on personnel be underestimated. CT makes it possible to move more goods with a smaller number of one's own employees. Due to the — rightly — strict labour laws, one driver alone is no longer able to deliver a shipment by road over a distance of more than 700 km in one day - unless, of course, the driver intentionally infringes the regulations. But it is precisely compliance with the driving hours and rest periods which will be checked to an increasing extent over the next few years.

The Hamburg international freight forwarding firm of Hoyer is one of the pioneers in combined transport. Every year the company group schedules 45,000 container- and semi-trailer shipments by rail. Dangerous goods in particular are, wherever possible, transported by rail or inland waterway by Hoyer Hamburg, its German branches and foreign subsidiaries, Rotterdam and Antwerp Tank Transport (RTT and ATT). Thomas Hoyer says: «Safety is the prime consideration in the transport of dangerous goods. We have therefore actively participated in establishing combined transport companies and we have developed a special multimodal transport container called the Hoyertainer. Rail transport is in most cases better for liquid products containers, as two heavy containers can often be carried in one wagon, whereas they would have to be transported separately by road because of the total weight requirement of 40 t or 44 t.» But why is so much Hoyer freight to be seen on the roads? The answer here is: «We use combined transport on the main routes where we also have return freight. The denser the CT network, the greater is the volume of freight which we can put on rail.»

Among road haulage and freight forwarding firms in France, the Rouch Group of Paris was one of the first to enter the field of combined transport. This medium-sized firm developed a high volume of traffic on the national network and later did the same internationally with traffic to Italy, Spain and the Benelux countries. The firm has invested heavily in swap bodies which are particularly suited for combined transport. When devaluations of the Italian lira began in 1992, CT to and from Italy was severely affected. This case is at the same time a classic example of the various fields which can be affected by exchange rate problems. However Pierre Fumat, general manager of Rouch, sees no reason to doubt the advantages of CT. He reports: « Thanks to more intensive use of our equipment, we can achieve a higher turnover in CT with our own employees and assets than in road transport alone. On average the increase is 20%. The customer can also benefit from the freight price advantage.» Does this mean that Fumat is perfectly happy? His answer is no. In addition to greater stability on the «currency front», his main wish is for «greater investment security through stable dimensions and weights in road transport».

Hangartner AG, which has its headquarters in the Swiss city of Aarau, is a firm which finds CT to be essential. Since 1980 this medium-sized freight forwarding firm has been systematically investing in equipment suitable for use in CT. Hangartner swap bodies can be seen throughout Europe, and this is no wonder as the company now has 1,900 of them. In terms of turnover, this firm has been for some years one of the biggest customers of Kombiverkehr and Hupac. A Europe-wide support base was also set up with the company's own employees at the main CT terminals. For Kaspar Hangartner, proprietor of the company of the same name, in addition to environmental considerations, the obvious business advantages also played a role in his decision to opt for CT. As a major example, Hangartner cites the greater loading capacity of swap bodies. He says: «The 28-t limit continues to apply in Switzerland. With CT we save on the high cost of transshipment, because, if put on the road, freight from a road train with a total weight of 40 tons would have to be divided among two lorries with a maximum of 28 tons each. The risk of damage is also reduced.» Thanks to unaccompanied transport, the company was able to dispense with an extensive lorry fleet. However it cannot be said that everything is sweetness and light. Hangartner is particularly critical of the pricing policies of the railway companies and he warns them against abusing their monopoly position. If the achievements of CT are not to be jeopardised, he says, there will have to be greater price security. What he asks of the railway companies is that «the cost of rail transport should not increase at a faster rate than the cost of comparable road transport».

The night is an ideal time for combined transport operations. During this time, hundreds of CT trains cross Europe at speeds of between 100 and 120 km/h carrying shipments to destination stations so that the goods will be available for use the next morning. Of course, CT trains also travel during the day. The term, «night jump», has been coined to describe the extra-fast overnight CT trains. Through- and block trains are used on the routes with the highest traffic volumes. These are trains which carry single-destination shipments via containers intended only for one destination terminal.

From the standpoint of the operators and the railway undertakings, the through train is the most economical form of train operation, as there is no need for time-consuming and expensive wagon-regrouping operations in marshalling yards. This type of train is therefore also highly reliable and an absolute must, especially for just-in-time operations. Depending on the daily volume, wagons are either added or removed at a final terminal. Shuttle trains are a particular variant of the through train, as they operate on the basis of a fixed train composition.

Along with through trains, multi-group trains constitute the basis of the CT network. These are trains with shipments for two or more destinations. Wagon groups are exchanged between trains at transfer stations and are combined to form new, single-destination through trains. A particularly advanced type of train building is carried out at the «nodes» or «hubs», as they are called. For reasons relating to technical operations and quality, the leading railway

undertakings are now engaged to an increasing extent in establishing hubs at strategically favourable locations.

Where road vehicles or their loading units go by rail as combined transport, a number of special features need to be taken into account, as the usual loading dimensions for railway wagons are exceeded. The upper limits for the height and width of a loading unit are set by the loading gauge. On a number of rail routes there are restrictions on these dimensions because of tunnels, bridges, overhead cables and projecting railway station roofs. These gauges, which are used for all units used in CT, are therefore coded. The yellow code sign tells a railwayman the dimensions of a loading unit. Capital letters, such as «C» for a container or swap body, «P» for a craneable semi-trailer in a pocket wagon, and «A» for an Alp trailer, are used to describe the various containers. The following are some examples. P 70 indicates a craneable semi-trailer with a height of 3.30 m (basis of calculation) plus 70 cm = 4 m. Code C 25 indicates that a swap body has a height of 2.45 m (basis of calculation) plus 25 cm = 2.70 m. The loading gauge for each CT route is known. As a rule there are few restrictions for containers and swap bodies, and in the past few years even the Alpine tunnels have been developed in a manner which enables most of the craneable semi-trailers used in road freight transport to pass through the Alps. There are greater difficulties with bulky jumbo containers and with semi-trailers generally in Great Britain. Rolling motorways which can accept complete road vehicles exist only in a few countries which have the largest loading gauge.

Combined transport is suitable in principle for the transport of all types of goods which are also carried by road over longer distances. There are practical restrictions only for goods which have special requirements as regards constant supervision or schedule times. In the case of temperature-controlled goods, the lorry driver has responsibility en route for monitoring operation of the heating and cooling units. In CT such goods will be found mainly in the fast through-trains. On the other hand, green products, i.e. fruit and vegetables, have different requirements. They often need to be in the large markets by around four o'clock in the morning and therefore do not usually fit into existing schedules. By contrast, dangerous goods are more suited to rail transport because of the considerably higher level of safety provided. During the past few years legislatures have tightened up still more the regulations on dangerous goods. If a higher safety level is established for road transport, this will enhance the attractiveness of combined transport.

There are many reasons for acceptance of CT. These reasons include the range of schedules offered. The demands of shippers and the transport sector can be reduced to a single common denominator: loading up to a late hour at the dispatch terminal and early availability at the reception terminal. What is required is a fast A/B connection in domestic CT (departure in the evening, collection the next morning) and usually A/C connections (collection on the second following day) in international transport. Meeting these wishes constitutes a major task for both the railway undertakings, which must make available the necessary railway slots, and for the operators who establish the service on this basis and also usually make the wagons available. Customers' wishes cannot always be fulfiled. One reason for this is that rail freight transport must share rail capacity with passenger transport. Moreover interruptions due to technical reasons occur in international transport, for example, due to a change of locomotives at a border crossing point or due to different power systems.

The demand for international CT connections will increase as Europe becomes more integrated. As in the case of rail passenger transport, regular quality services have been developed for the most varied routes in Europe.

Service: varied and customer-oriented

There are now competitive services for even the most distant destinations. Only a few examples can be given here.

In 1994 and with support under the EU Commission's PACT programme, the Italian operator, Cemat, together with companies in neighbouring countries, started up a direct first-time CT link from Greece via Italy to Central and Northern Europe. In this service, trains departing from a total of twelve German terminals and from several Dutch and Belgian terminals are bundled for travel to the North Italian Milan-Rogoredo terminal. Based on Milan, Cemat operates fast daily through-trains to the ports of Ancona, Bari and Brindisi where the containers are loaded onto a ferry for Patras or Piraeus. Depending on the connection involved, the Greek port is reached on the third or fourth day following departure from the dispatch terminal.

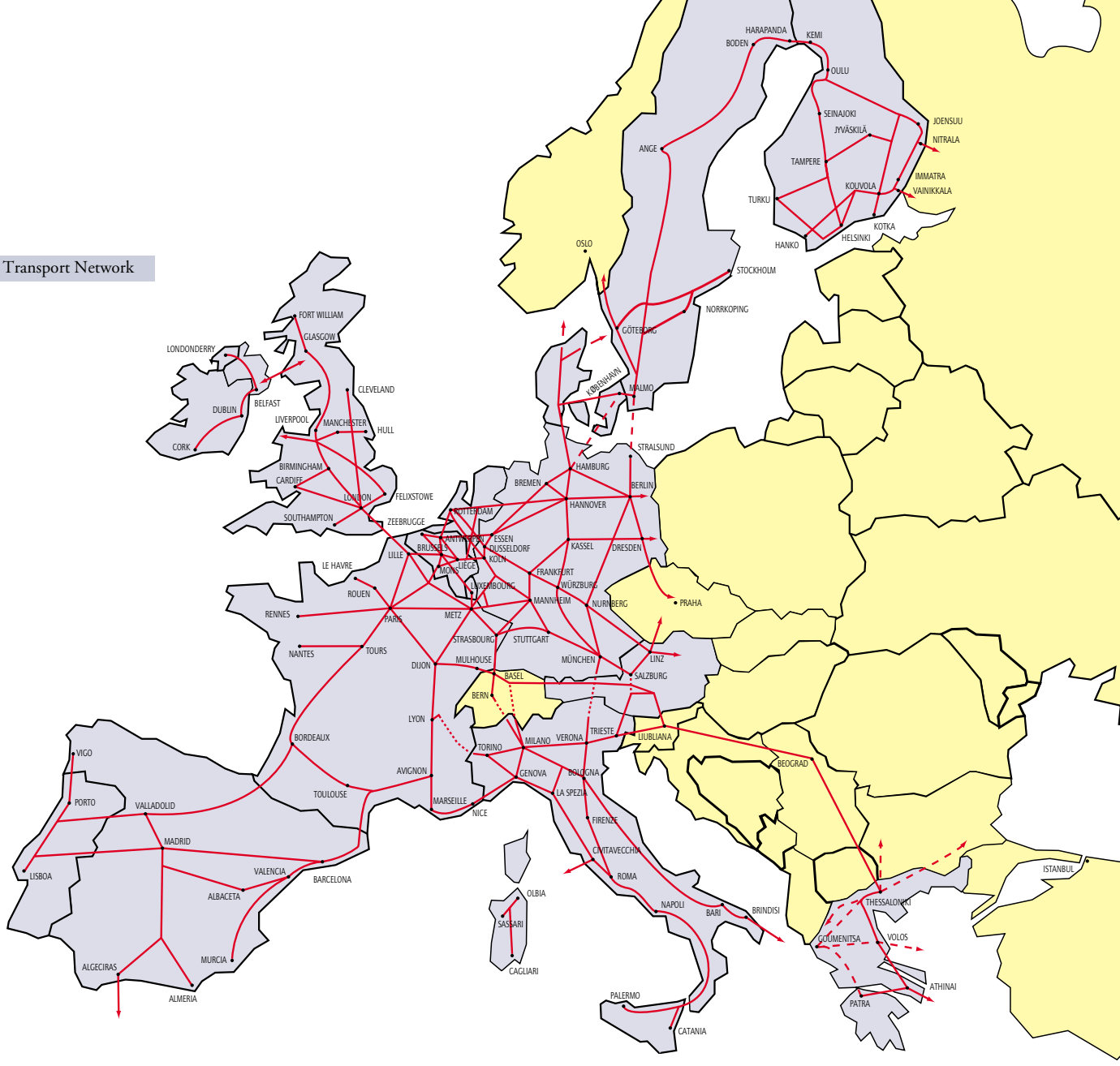
During the past few months, much has been done in CT with traffic between Rotterdam, the largest seaport in the world, and its hinterland. What is mainly involved here is providing a fast container transport service by rail. One of the most recently introduced trains is the complete train to Prague developed by Holland Rail Container (HRC) in cooperation with the Danish Maersk shipping company. Within a few months the operating schedule was increased to three departures per week and per route. Intercontainer-Interfrigo (ICF) in mid-May 1995 introduced a one-day A/B shuttle-train connection in traffic between Rotterdam and Switzerland. There has been an intermodal complete-train connection since the end of June 1995 between Rotterdam on the one hand and France, Spain and Italy (and vice versa) on the other. The train operates five times a week in both directions. It is operated under the trade name of «Mediterranean Shuttle» and is marketed by the Dutch operator, Trailstar. It offers a transit time of from 20 to 24 hours for Central and Southern France and of from 30 to 40 hours for Spain, and Central- and Southern Italy.

The combined-transport companies of TRW (Belgium), Novatrans (France), Combiberia (Spain) and Cemat (Italy) collaborate in providing this train service.

There has been one good example since the end of 1994 as regards the variety of methods of cooperation in CT and its efficiency. Following the example of road transport, air traffic between Frankfurt and Milan is now being transferred to rail. The participating partners are: Kombiverkehr (D), Hupac (CH), Cemat (I), the German freight forwarder, Mainsped, and Lufthansa Cargo. For this purpose special air-freight containers or ULDs (unit load devices) are loaded at Frankfurt airport onto a special lorry trailer of the Mainsped freight forwarding firm. The trailer is equipped with a driven conveyer belt like the one used in Lufthansa cargo planes. The ULDs loaded onto the trailer are carried by lorry to the combined transport terminal in Mannheim which is 80 km away. At that location they are loaded onto the extra-fast combined-transport shuttle train to Northern Italy provided by Hupac, and they are then transported to Busto Arsizio north of Milan. At that destination it is once again Mainsped which ensures that the trailer gets to Milan airport. A trailer loaded on a Tuesday in Frankfurt will be delivered on Wednesday morning at 10.00 hours in Milan-Oltre. The trailer is loaded again on the same day by 15.00 hours and is available by 8.30 hours on Thursday morning in Frankfurt at the Lufthansa Cargo Center. The next round trip takes place from Thursday to Sunday. One important reason why Lufthansa is using CT is because of the problems encountered with incoming and outgoing traffic at their major hubs. This applies especially to lorry traffic which must pass through sensitive areas such as the Alps.

In Hungary success has been achieved in transferring a considerable volume of traffic to the railways. Thus in 1994 around 25,000 lorries were transported on the rolling motorway between Wels (A) and Szeged (HU) in collaboration between Hungarokombi and

EU Combined Transport Network



Ökombi. As a result of the services provided by various operators, Hungary now has excellent connections with the North Sea ports of Bremen and Hamburg. The Danube-Elbe Express of Hungarokombi and its German partner, Kombiverkehr, provides a daily connection with a transit time which road transport cannot hope to match. An additional complete train is being marketed as a joint product of various partners under the lead management of Intercontainer-Interfrigo. The Hansa-Hungaria Container Express (HHCE), which is suitable for almost all commonly used types of containers, provides «antenna trains» at the Sopron terminal in Hungary in a service to and from other countries such as Romania, Ukraine, Greece, Bulgaria and Turkey.

New opportunities have also emerged for CT following the opening of the Channel Tunnel to rail freight transport at the end of September 1994. The European CT marketing companies and the two railway undertakings, BR (Great Britain) and SNCF (France), which operate directly in the Tunnel catchment area, have developed a number of services. For example, the Bell Lines shipping company, which specialises in European short-sea transport, in June 1995 established, jointly with Intercontainer-Interfrigo and Railfreight Distribution, a complete-train container connection between various British terminals and Milan. By the Spring of 1995, the UIRR company CTL was operating 52 trains every week through the Channel tunnel. Its most important routes are those from Great Britain to Northern Italy and Spain, while additional routes are being developed to France, Germany and Switzerland.

As these examples show, CT is not a static service. Wherever a market potential develops, the appropriate CT connections will be established.

The European transport market is a growth market. The more intensively international economic activity develops, the greater is the increase in the exchange of goods and the related demand for transport services. With the fall of the Iron Curtain at the end of 1989 and the beginning of 1990, transport growth has accelerated once again. According to expert calculations international traffic alone will increase by around 60 % during the period 1998 to 2010. Transport is, however, to an increasing extent encountering limits to its development. Infrastructures are hopelessly overloaded. Traffic jams are a common sight in all European countries. In the case of the EC (European Community) with its former membership of twelve Member States, the cost of traffic congestion amounts to around ECU 100 billion annually.

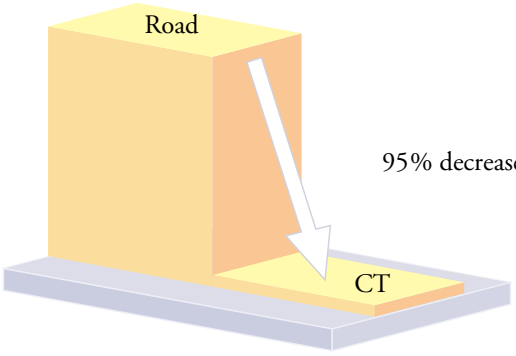
Many governments are making great efforts to compensate for past shortcomings relating to infrastructure. In 1994 the EU Commission presented a major action programme under the working title of «Transeuropean Networks» (TENs). This document defines the Community's main infrastructure projects and coordinates the measures to be taken by the various Member States. Implementation of only the most important parts of the TENs will swallow up more than ECU 220 billion. Arrangements for full financing have not yet been completed. On the other hand it is clear that the focus of the TENs is on the modes of transport classified as being particularly compatible with the environment, which means rail and inland waterways. In addition to the financial problems there is the increasingly urgent issue of the political acceptability of transport. It is no longer sufficient to decide on the funds required for construction of an infrastructure project and to make the money available. In the European countries people are increasingly reluctant to accept large-scale infrastructure construction and extensions. There is resistance to this on all sides. Planning timescales, which are long in any event, are thus being extended even further. An increasing number of people feel traffic to be a major intrusion into their personal lives. This applies in particular to road freight transport.

Moreover the connection between traffic development and environmental pollution is becoming obvious with each passing day. Traffic has now been identified as a major cause of the so-called greenhouse effect. Eurostat, the EU Statistical Office, ascertained that in 1988 the energy consumed by the countries which were members of the EC in that year amounted to 211.52 million tons of crude oil units for the transport sector. This represented 30 per cent of total energy consumption in the EC. The lion's share, namely 84.4 per cent, was accounted for by road transport, while only 2.5 per cent was accounted for by inland waterway transport and 2 per cent by rail transport. The leading industrial countries have now committed themselves to substantially reducing emissions of harmful waste gases into the earth's atmosphere by the end of the century. This applies especially to the CO_2 greenhouse gas. The sensitive character of the relationship between transport and the environment was clearly expressed by the EU Commission in its Green Paper in the following terms: «The impact of transport on the environment is increasingly becoming a focus of critical interest in the industrialised world. The global character of environmental problems is leading to a situation in which public opinion is becoming increasingly aware of the need for a world-wide strategy».

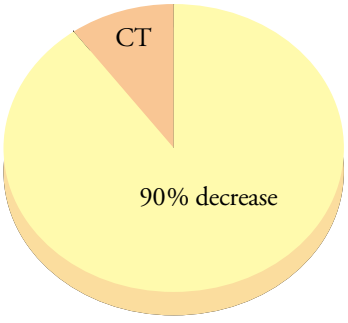
Environmental pollution is not the only form of pollution caused by transport. For some years scientists have been making great efforts to ascertain the full extent of pollution caused by traffic and to summarise it under the concept of external costs. OECD calculations show that the overall economic cost of road transport alone (i.e. due to environmental pollution, noise pollution, traffic congestion and accidents) could be as high as five per cent of GDP (gross domestic product).

What can transport policy therefore do in order to ensure environmentally friendly mobility in the future? In view of the looming long-term gridlock and prospective climate changes, there is an increasingly clear need to network transport modes intelligently with one another and to integrate them into a global approach. It is necessary, however, in this connection, to apply the principle of the EU Commission that only solutions in conformity with the free market should be adopted. There can be no orders from above as to which mode of transport should be selected for any specific form of transport. Instead, the optimal solution should emerge from the free play of market forces. It is the task of politics to establish the general framework in which competition will take place and to require and work towards ensuring that each mode of transport equally bears the infrastructure- and social costs which it causes. Only for as long as this is not ensured will government assistance to certain modes of transport be necessary.

Combined transport is considered to be the best solution for overland freight transport. If CT is used to a greater extent in the future, this will by no means signify that all competition between the several modes of transport will be excluded. Lorries will not be pushed out of the market in this manner. The contrary will be the case. It is an inherent feature of CT that it promotes mutual cooperation between the several modes of transport. Proof of this can be found in the fact that freight forwarders, road hauliers, and the relevant sectoral organisations have participated in the many European CT companies and continue to do so.



Decrease in casualties from accidents



Decrease in atmospheric emissions

The general situation and promotional measures

Combined transport has become the best hope of international transport policy. As a result the EU Commission, for example, has raised development of a Europe-wide CT network to the status of a project of a top-priority Community interest. Moreover in the past few years a number of legal measures have been introduced in order to improve the general situation for CT. It is the aim of transport policy to ensure, through this targeted aid, that CT will provide vital assistance in reducing the so-called social costs of transport. These include in particular the economic costs of accidents and environmental pollution. The Commission considers promotion of combined transport to be necessary during the transitional period and until all modes of transport are paying the costs which they have generated. Moreover a number of measures are designed to compensate CT for its current systemic disadvantages. Reference is made in this context to an «equalisation of disadvantages».

During the past few years the EU Commission has initiated many directives and regulations in order to achieve this objective. Both technical and fiscal areas are covered. One example is the approval given for higher total weights in initial and final journeys by road with ISO containers. The permissible total weight can be as high as 44 tons in EU countries which normally permit only 40 tons. The precondition for this is that a vehicle must be used in combined transport. A key reason why CT vehicles may have a heavier total weight is because of the greater tare of the containers used in CT. Some countries also allow the higher weights for swap bodes and semi-trailers. This regulation has had a particularly favourable impact on the transport of liquid-products freight, as it is dangerous goods which are mainly involved. CT is especially recommended for these products.

Yet another promotional measure, abolition of the so-called prohibition on cabotage for CT, is no longer of importance in the European Union, as cabotage (national freight operations abroad) is being generally allowed to an increasing extent.

Transport operators who engage in CT operations can save on motor vehicle taxes in most countries. The idea behind this is that an operator who makes use of CT helps to reduce the load on road infrastructure. It would be contrary to the principle of equal treatment if the cost of using a second mode of transport should be added to the cost of road use (vehicle tax, tolls, mineral oil tax). An operator therefore «acquires» a right to a corresponding tax refund in respect of non-use of road infrastructure. The amount of this tax refund depends on the number and length of journeys made by means of CT. One example can be given. In 1992 a refund of around ECU 5,000 was made in Germany in respect of a 40-ton lorry carried in RoMo transport. In other countries and in Germany also the amounts have been significantly less since reduction of the motor-vehicle tax. It is to be hoped, however, that CT will continue to be exempt in future from payment for motorway vignettes. There are also measures which aim at making CT attractive. These include exemption from certain driving prohibitions (e.g. on weekends and holidays) and, in the case of RoMo transport, recognition of travel time by rail as a rest period for the driver.

It is very important that there should be opportunities for certain types of investment in CT to be subsidised with government funds. This applies, for example, to the procurement of wagons and other special equipment needed to engage in CT operations. In some cases the EU allows Member States (in the same way as Switzerland and Austria have been doing for some time) to provide grants towards operating expenses during the startup phase of a specific CT project. The fact that the EU Commission decided on a regulation on financial assistance in the case of CT is unusual, as the EU rules lay down, as a matter of principle, that state subsidies should be dispensed with as far as possible. The EU body departed from the principle in this instance, however, as CT has been declared to be a matter of great Community interest. In addition to the EU Commission, other bodies operating outside the EU framework have also been dealing with the question of CT.

LEGEND			
☺	favourable to combined transport	-	does not apply
no	not present	✓	does apply
Maximum weight for vehicles (tons)			
Exemption for 44 t for vehicles used in terminal pick up and delivery			
Vehicle tax in Ecus per year for a 40 t road vehicle			
Total or partial tax exemption for vehicles used in combined transport			
Diesel fuel taxation in road transport in Ecus per litre			
Restriction of road transport operation on Sundays, holidays, weekends and vacation periods			
Exemption for intermodal operations from these road restrictions			
Subsidies for investments for combined transport			

In a document entitled «European Agreement on Important International Combined Transport Lines and Related Installations», which has been signed to date by around twenty European states, the UN has summarised important objectives in the field of CT infrastructure. These include, for example, increasing the speed of CT trains to 100 km/h or even to 120 km/h. An increase in train length to at least 600 m, and preferably 750 m, has also been called for. And, last but not least, train weight should be increased to 1,200 or 1,500 tons. The European Conference of Ministers of Transport or ECMT (Paris) supports coordinated promotion of CT throughout Europe among its 31 Member States. An international hearing was held at the end of 1994, and an extensive list of demands was drawn up. Subsidies, in the view of the ECMT, are a good investment «if positive transport policy results can be achieved by means of the relevant combined transport services». The European Conference of Ministers of Transport supports greater equity in the charging of infrastructure- and social costs to all modes of transport. If success could be achieved in this field, CT could demonstrate its inherent advantages without the need for special promotional measures.

AT	BE	DE	DK	ES	FI	FR	GB	GR	IE	IT	LU	NL	PT	SE	BG	CH	CZ	HR	HU	NO	RO	SK	SI
40	44	40	48	40	48	40	38	40	40	44	44	50	40	56	38	28	48	40	40	50	40	40	40
✓	-	☺	-	☺	-	☺	☺	☺	no	-	-	-	☺	-	no	☺	no	no	☺	-	no	☺	no
2800	1110	1490 / 1700	550	410	1480	860	2110 / 2300	370	1000	775	720	1000	380	1720	90	1450	1280	2000	530	1580	n/a	1160	2000
☺	☺	☺	no	no	no	☺	☺	no	no	no	no	no	no	no	no	no	☺	no	no	no	no	☺	☺
0,25	0,30	0,33	0,3	0,25	0,3	0,33	0,4	0,26	0,3	0,44	0,25	0,32	0,30	0,28	0,126	0,53	0,44	?	0,3	0,4	0,16	0,39	0,3
✓	no	✓	no	✓	no	✓	no	no	no	✓	no	no	✓	no	-	✓	✓	no	-	-	✓	✓	✓
☺	-	☺	-	no	-	no	-	-	-	no	-	-	no	-	-	no	☺	-	-	-	no	☺	☺
☺	☺	☺	no	no	no	☺	☺	no	no	☺	no	no	☺	no	no	☺	☺	☺	☺	no	no	☺	☺

Trans-alpine traffic

Viewed from a transport and geographical perspective, the Alps constitute a special problem area. In trade between Northern and Southern Europe the impact of this mountain range is like that of an over-sized bottleneck. Until the Iron Curtain came down, the question of transit traffic through the Alps received a great deal of attention in European transport policy, and freight transport was the focus of many rounds of negotiations. One reason for the «bargaining» between the EU Commission and the governments of the two core Alpine countries, Switzerland and Austria, was the huge increase in freight transport along the North-South routes.

Conservative estimates indicate that, while around 68 million tons of freight were transported through the Alps during 1988, this figure will increase to around 140 million tons by the year 2020.

Around 20 percent of this volume is accounted for by Switzerland, while the remaining 80 percent is distributed equally between Austria and France. Due to the topography involved, any extensive development of transport infrastructure has to be ruled out in the highly sensitive Alpine area. Infrastructure often has to be fitted into the narrow valleys at great architectural expense. People in the Alpine area find the consequences of the noise, exhaust fumes and congestion caused by transport to be particularly objectionable.

Austria and Switzerland are willing to meet their responsibilities as transit countries, particularly as the prosperity of both countries depends to a considerable extent on a smooth flow of external trade. The entry of Austria into the EU in 1995 has increased still further the need for free movement of goods and services.

However, both governments insist that rail should carry as much as it can of the transit freight traffic.

Switzerland has been insisting for many years that only heavy goods vehicles with a maximum total weight of 28 tons may transit the country. The Swiss people have even demanded in a referendum that transit traffic be transferred completely to rail within a period of ten years. All efforts to date by the EU countries to persuade Switzerland to abandon this position have failed. As long as transit lorry traffic continues to increase, there is little prospect of a change in attitude on the part of the Swiss people.

Austria is also pursuing a firm policy. In 1989 Vienna declared a ban on night driving and replaced the previous transit license requirements for lorries with an eco-points system under which Austria intends to limit emissions of pollutants by lorries. One consequence has been that European manufacturers of commercial vehicle have made every effort to reduce further the emission of pollutants by lorries. As a result, lorry transit traffic has increased despite the eco-points restriction.

Neither country is satisfied, however, with restrictive measures to stem the lorry avalanche. They are also pressing ahead with development of rail routes and are subsidising CT to keep its tariffs competitive. Switzerland has initiated a major «Alpine transit» project under which around 15 billion CHF is to be invested in the development of rail infrastructure by the year 2010. When these measures are fully implemented, with the capacities then available to them, the Swiss SBB federal railway companies will be able to transport across the Alps around half of the freight volume forecast for 2010. This volume could be around 70 million tons. The main feature of the «Alpine transit» project is construction of two new main tunnels under the St Gothard (49 km in length) and Lötschberg (28 km) passes. These two tunnels will result in a significant increase in capacities on the North-South axis routes.

Pending completion of these major projects, a number of measures are being taken for the further development of combined transport. Train weight has been increased on the Gothard route. SBB locomotives can now haul 1,500 t instead of 1,200 t as formerly. Slot capacity on this route has now been increased to 700,000 shipments annually. Following installation of an additional track in the Lötschberg tunnel, it will be possible to transport heavy goods vehicles with a corner height of up to 4 m as from 1998. This means that in practice there will no longer be any height restrictions.

Huge sums are also being invested in Austria for the further development of infrastructure. Current planning includes construction of a main Brenner tunnel by the year 2010. Vienna intends to create additional rail capacities by this date, so that it will then be possible to transport between 50 and 80 million tons by rail. In the past few years this Alpine country has performed an impressive tour de force in the rail sector. CT capacities for up to 1.6 million shipments have been available since 1994.

Operators involved in trans-Alpine transport have also demonstrated a high level of efficiency. They have developed a dense network of RoMos and trains for unaccompanied CT. These companies are also backing the shuttle train concept which combines short travel times with high productivity. For example, by the middle of 1995, the Swiss operator Hupac had succeeded in arranging for 22 shuttle departures in North-South traffic.

All CT companies have improved CT technologies over the years, thus showing how innovative they are. High-cube containers, e.g. swap bodies and high-cube maritime containers with a corner height of 2.90 m, can also be transported with new «megawagons».

Although they are encountering increased competition from road hauliers, operators in the trans-Alpine business are confident that the triumphant advance of CT can be continued. In any event, as far as freight traffic is concerned, combined transport now accounts for 10 per cent of this traffic between Italy and France and for 20 per cent between Italy and Germany. On some «race tracks», such as the Cologne-Milan route, the figure is now as high as 40 percent.

New routes: central and eastern europe

The transport market in the countries of Central and Eastern Europe is undergoing a radical restructuring. The former state monopoly suppliers of transport services have been dissolved. This has led to a situation in which a huge number of minuscule, small and medium-sized hauliers and freight forwarders have come into being who, during the development phase, have taken over the fleets of the former state-owned enterprises. These are mainly technologically obsolete vehicle fleets.

This dramatic increase in the supply of lorry transport services has led to an oversupply of transport capacity in the countries which are carrying out economic reforms. Because the restructuring of the planned economies in the direction of a market economy has led to the disappearance from the market or restructuring of many industrial firms, the «freight shortage» is being aggravated. As a result of this development, transport prices have gone through the floor. Those who have suffered the most have been the railway companies some of which have lost half of their freight volume. On the other hand road infrastructure, which in those countries was in any event underdeveloped, is hopelessly congested. Traffic jams and frequent accidents are common.

A large part of trade between the former East bloc countries and West European countries is by lorry. In 1991 alone around 15 million tons were transported on the axis routes linking Northwest- with Southeast-Europe. This volume will double by the year 2010. The full drama of this development can be witnessed at the border crossing points leading to the West European countries. At these locations lorries are backed up in endless waiting lines, and the patience of both drivers and the local population is taxed beyond the breaking point.

While the development of CT in Eastern and Southern Europe is still at an early stage, the initial results look promising. As early as 1993, around 70,000 lorry units were carried between Northwest- and Southeast-Europe, and as a result the roads were relieved of around 1.2 million tons. Most of this freight was carried on the RoMo, while only 20% was transported by unaccompanied CT.

Own-account CT companies have now been formed in various countries and they have joined the UIRR. They have set themselves the objective of preparing the ground with a view to having the local transport sector recognise, accept and use CT as an independent, efficient and attractive transport technique. This kind of «missionary» activity, however, calls for a great deal of time, patience and especially money. Because of the fragmentation of the transport sector into thousands of small firms, it is very difficult to approach them individually. Moreover considerable mistrust of the state railways still exists among many of these firms.

Most of the road hauliers are not — as yet — equipped technically or financially for CT. Equipment which can be used in CT such as craneable swap bodies and semi-trailers are available only in increasingly small amounts. In other ways also, the general situation does not favour the development of CT.

There are no efficient CT terminals which can be easily reached by both lorry and rail transport. The few available CT installations lack the required transshipment equipment in the form of either stationary cranes or mobile transshipment vehicles.

The UIRR companies have recognized that they must take action if they are to tap this promising market. There have already been some promising signs. In 1992, for example, the new Hungarian combined-transport company, Hungarokombi, established a RoMo between the Austrian city of Wels and Budapest. In the space of only six months it was found possible to transport 16,000 lorries without harm to the environment. There has been a RoMo between Dresden and Lovosice in the Czech Republic since September 1994. This connection also serves as a bypass for the completely congested infrastructure and it protects people in a very sensitive highland area. While the rolling motorway provides easy access to CT, the considerably more economical form of unaccompanied CT is being gradually developed.

Since the Autumn of 1994 the Danube-Elbe Express has been operating on a shuttle basis between Hungary and the North German ports in an unbeatable short time. A fast complete-train (the Prague shuttle) also operates between Rotterdam and Prague, giving priority to container transport. There are additional services between Duisburg and various destinations in Poland. Kombiverkehr, a company which is a member of UIRR, took an unusual step when it inaugurated in April 1995 a service from Lübeck to St Petersburg and Moscow. This route is an attractive one, as the container is first transported on an existing Baltic connection to Finland where the Finnish state railway company assumes responsibility for transport, later handing over the freight to a Russian railway company which delivers the containers to the destination terminal.

One thing is clear from these few examples. There are enough ways and means of also gaining a foothold in the East European countries. But for all their ambitions, operators know that they are not in a position to undertake the huge tasks on their own. They need the support of the various railway companies on a partnership basis and they need active support from transport policy. The general transport policy framework must be right. If this happens, the road hauliers and freight forwarders of the countries of Eastern, Central and Southeastern Europe which are engaged in economic reforms will also adopt CT as an attractive, efficient and, above all, environmentally friendly transport technique.

A system will be successful only to the extent that it continues to be developed. This also applies to CT. «We must ensure that freight can be transshipped from one mode of transport to another safely, economically and at reasonable cost». With these words, EU Commissioner Neil Kinnock made a significant statement which points the way to the future.

In fact intensive research has been under way for years in the field of transshipment technologies, and alternative solutions are now at the implementation stage. The main objective here is extensively automated and computer-assisted transshipment from one mode of transport to another and from one train directly to another. It can be implemented with a minimum of investment.

The French SNCF «Commutor» project for the rapid loading of containers and swap bodies operates in accordance with this principle. The aim is to develop an extensive route network, the focus of which will be a central transshipment node (hub). Fast through trains will link the transshipment points with one another and with the hub. Transshipment will be made in parallel by means of computer-controlled robots. It will be possible to dispatch up to 50 trains daily at these «Commutor» terminals. The first test installation of this kind is located in Paris.

In Germany, Krupp Fördertechnik GmbH has developed a so-called «rapid transshipment installation» which permits automated transshipment as if to a passing train. A demonstration installation has already been put into operation in Duisburg with assistance under the EU PACT programme. The system has two advantages: it occupies only a small space and it provides compact interim storage for the loading units. This concept is therefore ideal for small and medium-sized transshipment terminals, and many new installations of this kind will be required in future throughout Europe. Because of its modular design, this kind of installation can be developed in a relatively short time and can grow in pace with traffic volume.

There are other examples which demonstrate the capacity of CT for innovation. The «combilifter» for horizontal transshipment of swap bodies is a technology which is midway between a transport vehicle and a transshipment installation. It was developed jointly by Mercedes-Benz AG and the French structural engineering firm, Lohr Industrie. For cost reasons, the designers decided not to make the system suitable for use with other containers. In the opinion of its designers, the combilifter is best suited for use in a CT area. It is available with a minimum of basic infrastructure equipment.

In recent years research has also been devoted to the so-called bimodal systems. This technology is already being used in the USA under the name of road-railer. Semi-trailers which are specially stiffened for train operation lie on bogies during transport and therefore make up «wagon units», so to speak. The bogies and semi-trailers are separated at the destination terminal, and the further transport of the semi-trailers is therefore possible without any great loss of time. This system is also particularly suited to paired traffic flows. However, the bimodal system is being introduced in Europe only slowly. Thus a direct service

was introduced in June 1995 between Munich and Verona with financial assistance from the EU.

Technological developments are also taking place with loading units. Interest is focusing on improving the most successful CT loading unit, the swap body. An increasing number of hauliers and freight forwarders are using jumbo- and mega-containers for the transport of bulk goods. Calls are increasingly being made for additional technical adaptations of these containers so that they can be used in future in other intermodal chains. The demand here is for a swap body which can be stacked just like a container.

CT is no longer feasible without modern electronic data processing technology. As industrial firms are to an increasing extent reckoning the transport of goods to be part of the actual production process, relevant transport-related data must also be rapidly available. The data, as an expert would say, must be available ahead of actual transport. Modern electronic data processing technology also makes it possible to keep track fully of shipments, even in international traffic. This can be done through automatic identification, a technology which is already in everyday use on railways in the USA and which will also come to Europe. Relevant tests are now under way among several railway undertakings and operators. The EU Commission is assisting the further development of CT with various support programmes. These include the PACT pilot programme (Pilot Action for Combined Transport). The aim of this programme is to make intermodal transport even more efficient in the short term by promoting faster acceptance in actual practice of currently available technologies in the fields of transshipment techniques, information technology and telecommunications.

As the preceding remarks indicate, a great deal is being done to make combined transport more responsive to the market. Its development to date has been encouraging and often very impressive. Concerted efforts are required from road hauliers, operators, railway undertakings and policymakers in the field of transport in order to ensure the growth of combined transport over the long term, thus enabling this form of transport to make a decisive contribution to the solution of our transport problems.

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