



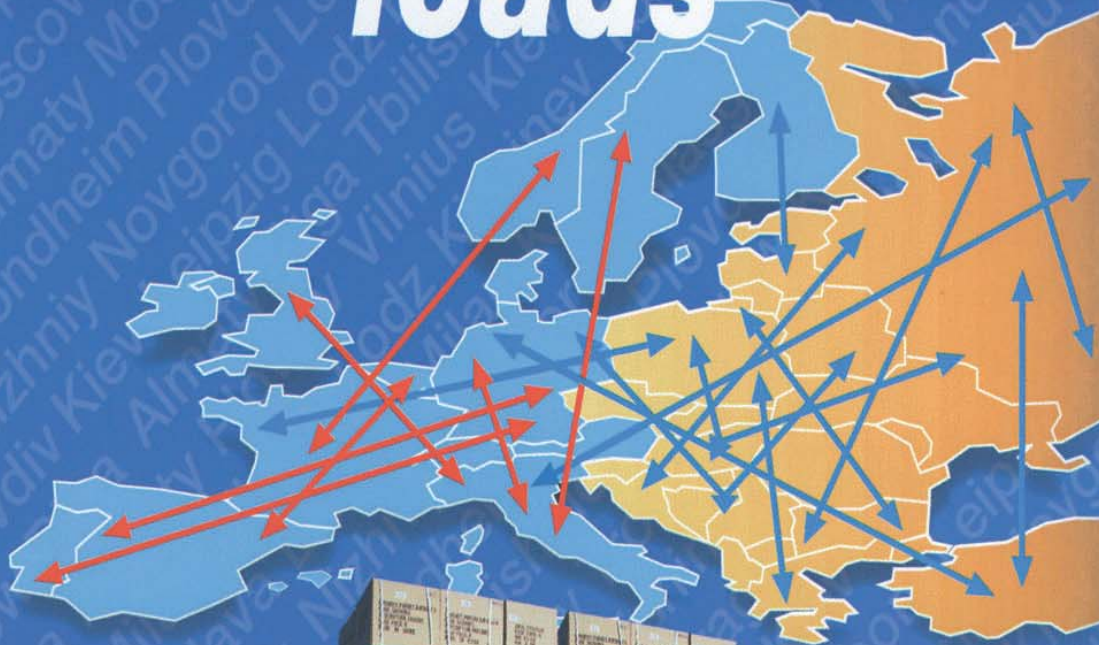
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# Best Practices on Intermodality

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## *Best Practices on Intermodality*

### **F&L Working Group Members:**

R. Vitale	- Procter & Gamble - Chairman
S. Rasmussen	- Intercontainer - Vice Chairman
J. Andriessen	- Philips
A. Bennett	- EWS
G. Boschetti	- Saima Avandero
P.M.A. Bloemendaal	- Nedlloyd
K. Iszlay	- Hungarocamion
H. Bortolotti	- LKW Walter
W. Maywald	- Kombiverkehr
G. Marta	- Gysev
E. Peetermans	- SNCB Cargo
M. Sollmann	- Voest Alpine
W. Shumacher	- Rhenania
R. Svensson	- Volvo Transport
K. Vanroye	- European Commission



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## 1. Introduction

### 1.1 Foreword

The constitution of the F&L Working Group on 'Best Practices on Intermodality - joint EU/USA' has been decided to cope with the objectives identified during the 'EU Industries Delegation Workshop' held in Washington on Oct. 30-31, 1997. Fourteen European companies were invited of which F&L attended with seven members. The purpose of the meeting was to promote a study on improvement of intermodal transport between Europe and USA. At the end of the meeting F&L was requested by both Mr. Blonk, Chairman of the European Delegation, and Mr. Huerta, Chairman of the US Delegation, to create a working group to identify/study the best practices on intermodality and include this activity in the **1998 F&L Activity List**.

### 1.2 Definitions

**Transport mode:** it is simply the method we use to transport goods; i.e. rail, road, inland waterways, pipeline, sea shipping.

**Intermodal freight transport:** combined transport has to be understood as an individual mode of transport which makes maximum use of the advantages of the various modes of land transport and short sea shipping, choosing those modes most suitable. Combined transport thus implies the organization of intermodal door-to-door transport by transferring goods from one mode of transport to another without changing the loading unit. To be more precise, combined transport is based on an Intermodal Transport Unit (ITU) in which the goods are transported from door to door by using the most adequate modes of transport :

- ❖ the road for initial and terminal hauls only;
- ❖ rail and/or inland waterways and/or short sea for the major part of the journey, the choice of modes depending on the itinerary, whereby the transfer between the different transport modes must be handled as efficiently as possible.

(DECLARATION ON COMBINED TRANSPORT adopted by The European Conference of Ministers of Transport at the

Council session in Budapest on 29-30 May 1996 - CEMT/CM 96-16).

**Terminal:** Terminals are locations for reloading of goods from one mode to another or for moving unit loads between modes.

**Cross-docking:** Cross-docking is a warehouse material handling logic where the products directly move from inbound truck to outbound truck with or without extra preparation, sorting or storage.

**Door-to-Door:** the transport of goods from the origin (i.e. production plant) to the final destination (i.e. receiving customer, regional distribution center). It is the transportation of goods under the authority of a single freight bill.

### Objectives of the Working Group \_\_\_\_\_ 1.3

The main objective of the Working Group (WG) has been clearly stated during the 'EU Industries Delegation Workshop' held in Washington on Oct. 30, 1997:

***identify the 'Best Practices on Intermodality' in Europe and USA and explore opportunities for further cooperation between the two regions***

The WG work activity is a part of a larger scope which is the improvement of intermodal transport between Europe and USA.

Of course, this is a high level objective and the first task covered by the F&L WG was the definition of some sub-objectives to deliver it. In particular during the first meeting, the team agreed to perform the following actions :

- ❖ analyse the market requirements on intermodality, in particular the needs of the shippers;
- ❖ collect data on 'good' examples of intermodal transport in Europe;
- ❖ define a set of Performance Indicators to measure those examples and select the 'best practices' to present as output of the WG effort;
- ❖ prepare a report presenting the 'best practices on in-

termodality in Europe' and use it as the basis for further analysis with the USA counterpart.

The last step will be the starting point to explore opportunities for joint EU/USA projects/studies.

The Working Group decided to limit the scope of the analysis only at the road/rail intermodal transport. The other transport mode combinations are not part of this initial study.

#### 1.4 European Transport Market Status - Overview

As published by European Commission, since 1970 European freight transport has almost doubled and further annual growth of about 2% is expected for the next 20 years. In particular, road transport reached a share of 73.6% in 1996 (48.9% in 1970) while only 13.9% is the market share of rail from 31.8 in 1970.

The road transport expansion is mainly the result of its bigger flexibility for door-to-door operations and speed of movements versus other transport modes. In particular rail transports are usually terminal-to-terminal and speed and frequency of deliveries are not as good as in road transport. The water transports (maritime and inland waterway) have the characteristic of low cost and it is specially emphasized when big quantities are shipped to distant destinations, the weaknesses of this mode compared with the other ones, are slowness and higher level of damages and losses.

The effect of the road traffic expansion in Europe is becoming extremely critical; traffic-jams and accidents are slowing the delivery times of road transports, moving in the opposite direction of the market (shippers and logistic operators) requirements. Traffic congestion is also generating environmental problems and the intermodal transport is more and more considered as a potential solution to move goods from road to other transport modes.

**Intermodal rail/road transport is currently covering only 4%** of the total traffic in Europe.

The limited expansion of intermodal transport is caused by several reasons i.e. : the lack of interoperability between modes, limited standardization of loading units and often, non efficiently managed terminals. Some of the problems were by-passed by the transport operators implementing special setups, for example many dedicated private terminals were built to increase the control of the door-to-door service and avoid the utilization of the non efficient terminals. Of course, this approach improved the service level but the total transport cost was negatively affected.

An other important element limiting the development of intermodal transport is the setup of many railway companies. In many countries national railway companies take care of constructing, maintaining and operating rail transport limiting the competition. EU is actively working in this area to encourage the market development and guarantee free access to rail system for all interested operators.

On top of the previous points we have also to remark that from a transport cost point of view, intermodality is competitive versus road transport only when a long haul has to be covered and only in specific areas of Europe.



## 2. “Best Practices on Intermodality” introduction

### 2.1 User requirements analysis

The first outcome of the analysis conducted by the WG showed that industrial and commercial transport users would be free to choose intermodal transport without the pressure of restrictions on other transport modes or due to other special measures.

***The shippers aim is to select the appropriate transport solution in a free competitive market. The decision should be taken comparing the proposed service using intermodal transport with single mode solutions and after a deep analysis of the different cost implications.***

The decision to use intermodal transport should come as the consequence of a competitive offer in terms of quality, reliability and cost. To be more precise, the shippers are interested in comparing/managing the intermodal transport like they already do for road transport, it means that they expect to receive a true door-to-door service. In other words, the service is measured on the total transport chain from the moment the shipper loads the vehicle (i.e. swap-body) to the time it is unloaded at the final receiving site. To match this specific requirement in the intermodal environment, the goods should pass smoothly through all the transport modes involved in the shipment. All the components of the transport chain (trucks in charge of shuttling from origin to the terminal and from the receiving terminal to destination, rail service, terminals) should maintain similar service standards (punctuality, environmental protection, safety, speed etc.) working together in a fully integrated intermodal chain system.

The core business of shippers is not the transport of goods, the offer of intermodal solution has to be as much as possible an 'on shelf' package without requiring user involvement along the entire transport chain. Of course, this expected service requires an efficient and effective cooperation between the different logistic operators involved in the shipment and a constant and complete information flow with the shipper.

Only when the above expectations are met, intermodal transport is able to compete with unimodal transport and only in this case the shippers can support concretely a policy to promote an intermodal solution in Europe.

The user requirements here described and consequently the transport mode selection has to be considered within

the evolving market : in the last years in Europe the majority of the Companies introduced programs to reduce working capital. It means that inventory levels dropped everywhere (i.e. production plants, Distribution Centers, final Customer delivery points) creating additional pressure on the transport chain.

For example in the grocery market, many distributors manage their secondary distribution from their distribution centers to the stores implementing a real cross-docking system. It means that the producer delivers to the customer warehouse "pallets" or "display" quantities of product, pre-built has requested by the receiver to be shipped to the final stores without being put into or picked from storage. The impact of this cross-docking setup on transport is clear, the product flow must be controlled at 100% and the punctuality and speed of the delivery is a prerequisite to work effectively. Considering what has been just said, reliability and fast delivery are becoming a common way to transport and due to the current level provided by intermodal services, the interest of shippers on road transport continue to grow.

## What does 'Best Practice' mean? 2.2

The definition of 'Best Practices' on intermodality is not a simple concept because it has to take into consideration requirements of shippers in one hand and services offered by the market in the other hand. Moreover, within the shipper community the evaluation of the same service can vary from low to high quality according to the different needs the shippers may have. So, the WG decided to apply the following process :

- ❖ fix service performance evaluation criteria based on facts uncoloured by feelings and opinions (database oriented process);
- ❖ measure the results achieved in the different components of the intermodal door-to-door service
- ❖ select as 'Best Practices on Intermodality' the ones obtaining the higher score.

The WG is confident that the agreed process will produce a meaningful set of current 'Best Practices' in Europe. In particular we expect to be able to explain why those inter-

modal routes are delivering the best possible service in Europe and point out which are the most important elements that should be taken into consideration to obtain the same positive results on other European routes.

### 2.3 Criteria / Guidelines to identify Best Practices ---

In the previous paragraph we presented the process to select the best practices on intermodality in Europe while in the following part the performance evaluation criteria are defined in detail.

The important concept behind the performance indicators is the intention to measure the service from the origin to the destination (door-to-door). To cope with this objective, the team decided to identify performance indicators for each of the single step of the transport chain and fix the way those indicators have to be measured. This approach provides enough data to qualify the overall service performance and gives the possibility to identify which components of the service have to be improved, if needed.

### 2.4 Performance Indicators ---

The performance indicators identified by the Working Group are listed here below. For each of them (nine in total) there is a brief description and the explanation of the mechanism to quantify it.

#### 2.4.1 *In time performance at the shipping site (origin)*

It measures the capability to pick-up the goods on time at the shipping site matching the loading day and slot-time, if requested by the shipper.

This indicator is calculated as: **% of punctual pickups on the total number of loads**

#### 2.4.2 *In time performance at the receiving site (destination)*

It measures the capability to deliver the goods on time at the receiving site matching the unloading day and slot-time, if requested by the shipper and or receiver.

This indicator is calculated as: **% of punctual deliveries on the total number of loads**

#### 2.4.3 *Flexibility*

It measures the capability to meet demand fluctuations and shipment peaks. The maximum variation

in the shipment profile should be agreed in advance and included in the agreement between shipper and intermodal operator.

The indicator provides an idea about the maximum flexibility provided on a specific intermodal route.

This indicator is calculated as: **number of loads exceeding the normal average number of loads absorbed by the system without negative impact on service (%) during a specific time period (i.e. day, week)**

#### 2.4.4 *Efficiency at the shipping terminal*

This indicator wants to measure the service reliability and efficiency at the shipping rail terminal. The load unit (i.e. swap body) arrived at the rail terminal has to be quickly moved from truck to rail wagon releasing the driver as soon as possible.

This indicator is calculated as: **number of loads moved within 30 min. from truck to train versus the total number of loads handled (%)**.

#### 2.4.5 *Efficiency at the receiving terminal*

This indicator wants to measure the service reliability and efficiency at the receiving rail terminal.

This indicator is calculated as: **number of loads moved within 30 min. from train to truck versus the total number of loads handled (%)**.

#### 2.4.6 *Rail service performance*

The rail component of the intermodal transport is evaluated measuring how the service meets the transport schedule. It means that the service performance is the result of the number of times the train is able to leave and arrive on time (as scheduled).

The indicator is calculated as: **number of trains matching the timetable versus the total number of trains operating on that specific route (%) during the same interval time**.

#### 2.4.7 *Shortage of capacity*

One of the problems intermodal transport has to face is the lack of equipment (i.e. flat wagons) at the shipping terminal to ship the load units. It means that the truck can arrive on time at the terminal but if the required wagon is not available there the load unit cannot be moved from road to rail.

To measure this transport component the following

indicator is recommended: **number of trains affected by shortage of capacity versus the total number of trains operating on that route (%) during the same interval time.**

#### 2.4.8 Tracking & Tracing Systems

An important point to measure intermodal transport efficiency is the capability of the operator to provide timely information concerning the on time delivery. There are many other important data that the shipper is interested in (i.e. position of the load at a certain point of the trip) but the on time at destination is for sure the most important one.

The indicator should report: **number of trains for which data concerning on time delivery is available versus the total number of trains operating on that route (%) during the same interval time.**

#### 2.4.9 Cost

As discussed previously, the intermodal transport introduces complexity in the transport chain: less flexibility versus the conventional road transport, demand variation and shipment peaks are often an issue, the average transit time of an intermodal door-to-door transport is frequently longer than the service provided by road operators.

Of course, there are other important factors to take in consideration (i.e. environmental implications) before selecting the transport mode, however the cost of transport remains one of the most important elements to decide which one has to be use. If the intermodal solution is not competitive, the extra effort required to manage intermodal transport is hard to justify. So, the WG decided to also evaluate this important factor of the service and it was decided to measure the competitiveness of the intermodal service versus the road transport: **difference between road and road/rail market price (%).**

*The performance indicators identified in this document are not covering the performance of the shippers.* In this first phase of the study we assumed that the goods are available for loading at the shipping site as communicated to the haulier. It means that if the truck arrive at the shipping site according to the loading day and slot-time, the waiting time will be negligible.

## Outcomes of the analysis

The outcomes of the analysis conducted by the Working Group confirmed that the intermodal service moves a small portion of the total traffic volume in contrast to trucking. Intermodal service at least for longer hauls, is expected to be comparable to trucking and more cost-effective.

In particular in the **Grocery Industry** environment, due to the effort to align raw materials sourcing/production decisions and consumers' purchase decisions (*Efficient Consumer Response - ECR*), transportation is a critical link of the supply chain. As consequence of that, concerning the decision to choose intermodal over trucks, the interviewed people stressed the interest of the shippers for the following criteria:

- ❖ delivery cycle time
- ❖ reliability
- ❖ price

The current role of intermodal in particular for Grocery Industry is extremely limited since ECR focus is on reduced order cycle time and increased reliability. It means that intermodal is mainly used for longer distance shipments and the possibility to increase this type of traffic is directly linked with the possibility of an improved service level (reliability, price, shorter delivery cycle time etc.).

Intermodal requires a different shipping process from truckload, and improved operations in the overall transport chain are a 'must' to provide the expected door-to-door service. This is clearly difficult to match due to the **fragmentation of the transport supply chain resulting from the multiple service providers (truckers, terminal operators, railway companies)**. The customers are interested in a 'seamless' service but in the market only few examples are meeting the expectations.

**The experience shows that to match the operational requirements the intermodal service needs to shorten transit time and improve on-time reliability through reduced congestion in the terminals and more efficient rail haul.**

The truckers have to live with long wait times getting into and out of terminals. It often happens because there are peak times during the day when truckers arrive and termi-

3.1

## 3. Examples of “Best Practices on Intermodality” in Europe

nals are not organized to manage them. During coffee breaks, lunch time and during the night efficiency in the terminals decreases dramatically.

A truck can travel almost 200 kms while the train is being loaded or unloaded and it means that the inefficiency at the terminal increase the gap between intermodal and road transport reducing further the competitiveness of the combined system.

**Intermodal is quantity-sensitive, and shipments need to be aggregated to make intermodal cost-effective**, it means that single loads (shipments) are extremely difficult to manage in terms of cost effectiveness and reliability. **The 'shuttles' and/or multi-customers block trains seem to be the most promising way to offer good services to the customers.**

### 3.2 Improvement areas

In the previous paragraphs we have seen the customers' expectations and the major problems emerged during the study. In this part the Working Group point out the critical areas that should be quickly fixed to improve the competitiveness of the intermodal transport.

The customers want to follow their shipments having reliable information about their position, estimated time of arrival and, if there is a deviation from the schedule, the new schedule and any alternatives. **The improvement of the current IT systems is clearly one of the critical areas** to take in consideration. Punctual and reliable information are needed to intermodal operators and ultimately to shippers. Continuous investment in technology is a key process to improve coordination among the different service providers in the transport chain.

Another opportunity in the area of service reliability is in finding a solution to **better manage the co-existence on the same rail infrastructures of passenger and freight traffic**. The priority always given to passenger trains reduce the reliability of the rail/intermodal transport service and of course it increases the gap between road and intermodal transport performance. On top of that, as previously mentioned, **the terminals need concrete actions to improve their service performance**. Working hours, staffing and standardization are some of the critical items to be addressed.

To summarize, the feedback collected during the analysis showed that several factors are negatively impacting the competitiveness of intermodal transport in Europe and high priority should be given to the following items, in particular :

- ❖ limit the wide range of techniques/equipment used (standardization);
- ❖ reduce the high cost and increase effectiveness in moving load units from one mode to another;
- ❖ improve the performance provided by terminals;
- ❖ guarantee service reliability by improving the rail part of the transport chain;
- ❖ invest in IT systems to improve communication and better control the traffic flows.

### Examples of Best Practices on Intermodality in Europe \_\_\_\_ 3.3

The previous comments concerning the problems and the opportunities of intermodal transport in Europe were the outcomes of an extensive research in the market involving many 'key players' currently operating in the market (i.e. manufacturers, rail companies, forwarding agencies, carriers, intermodal operators). In the same data collection process, the Working Group tried to identify good examples of *Best Practices on Intermodality*.

The Working Group presented the service criteria and the performance indicators to all the counterparts involved in the analysis to be sure that the evaluation of the intermodal examples was consistent with the approach identified in preliminary part of the study.

During this phase of the project, the Working Group realized that **accurate and complete data are missing for many of the intermodal services available in the European market**. It means that other good examples of intermodal service are probably available in Europe but due to lack of information/data, those ones were not reported in this document.



Thus, the Working Group decided to summarize in a chart the service results achieved in some of trade lanes analyzed in the study (see following chart) and only for them, explain the major reasons to consider those transport services as *Best Practices on Intermodality* in Europe.

### PERFORMANCE INDICATORS

DESCRIPTION	MEASURES				
	Cologne (DE)	Munchen (DE)	Gallarate (IT)	Antwerpen (BE)	Olofstrom (SE)
	Busto Arsizio (IT)	Verona (IT)	Muizen (BE)	Basel/Zurich (CH)	Gent (BE)
In time performance at the shipping site	99%	99%	90%	90%	100%
In time performance at the receiving site	99%	99%	100%	100%	100%
Flexibility	30%	50%	95%	50%	90%
Efficiency at the shipping terminal	95%	95%	100%	70%	N.A.
Efficiency at the receiving terminal	95%	85%	90%	90%	N.A.
Rail service performance	90%	92%	90%	75%	98%
Shortage of capacity / Quality of equipment	95%	92%	95%	98%	95%
Tracking and Tracing system	99%	99%	100%	90%	98%
COST	no remarkable savings / upcharges vs. other transport models				

In the following paragraphs detailed information concerning regular intermodal services are reported.

As you can understand reading the chart, a good door-to-door service doesn't imply that all the steps in the transport chain are reaching an acceptable performance. It means that if one of the transport component is not working at the expected performance level, high pressure is concentrated on the other components of the transport reducing the possibility to obtain a competitive service/results. Additionally, as already explained in previous paragraphs, we can concluded that the efficiency at the shipping and receiving rail terminal is often together with the rail service performance a limiting factor.

## Shuttle train Cologne (DE) - Busto Arsizio (IT) \_\_\_\_\_ 3.4

### **Service description (Operator: LKW WALTER)**

Route: Cologne - Busto Arsizio - Cologne

Shuttle trains are running on and back with always the very same number and combination of wagons, no matter if they are loaded or empty. Therefore this shuttle train guarantees 100% capacity all the time.

### **Service specifications**

- ❖ Three departures per day from the terminal Cologne-Eifeltor, at 14.00, 16.45 and 22.00, if needed, fourth train leaving at 24.00;
- ❖ Arriving at the terminal Busto Arsizio II, the next day at 07.30, 10.30, 17.30 and the fourth one would arrive on day C at 07.00;
- ❖ Capacity: about 30 pairs of swap bodies per train;
- ❖ Latest booking until 17.00 the day before departure - the intermodal operator have pre-booked space available on the trains.

### **Performance Indicators**

#### **In time performance at the shipping site:**

Normally the shipping sites are within 300 km of the terminal and the centralized trucking department of the intermodal operator is providing sufficient trucking facilities. The very same trucking department is looking for synergies combining the imports and exports of all combined traffic departments like Spain, Austria, Scandinavia and Italy. They optimize the use of the trucking facilities by avoiding empty mileage.

Due to the possibility of dropped empty swap bodies near the terminal the shippers requirements are met and the trucks are able to match the loading slot-times.

#### **In time performance at the receiving site:**

The receiving sites are situated within 300 km of the terminal Busto Arsizio II and there are enough trucks equipped for

the trucking of 7m swap bodies available. The trucking department for Italy receives automatically an on-line copy of the booking from Cologne to Busto Arsizio and therefore can organize in time the necessary trucking facilities.

They optimize the use of the trucks by combining imports and exports of the combined traffic departments (Scandinavia, Belgium, Netherlands, Germany, England).

The arrival of the trains is almost 100 % on schedule, therefore the unloading slot-times are met to to a very high percentage.

**Flexibility:**

Shipment peaks and demand fluctuations are handled through the possibility to shift capability between the traffic departments and eventual short-term hiring of further loading units. Within very short time a variation in demand of + 30 % can be handled as far as the equipment is concerned. But there is very little possibility of getting additional space on train and/or additional train departures.

**Efficiency at the shipping terminal:**

The swap bodies have to arrive two hours before departure of the trains (latest !), if not they will only be shipped on the next train. Cologne-Eifeltor is a very efficient terminal handling the traffic with very skilled people and showing a high speed performance.

Normally all units arriving two hours before departure of the trains are loaded without any delay.

**Efficiency at the receiving terminal:**

Busto Arsizio II is one of the most important terminals in Northern Italy for incoming traffic from Germany, specialised for the shuttle trains from Cologne and Mannheim. 2 portal cranes and one mobile crane guarantee fastest transshipment possible. A portal crane needs very little space, but can lift a high number of units in short time - handling capability will be increased by 3rd crane soonest. Swap bodies can be taken out from 6 am till 10 pm !

**Rail service performance:**

The on-time arrival of the shuttle trains is guaranteed by

highest priority on the transit route - only strikes and incidents can stop the trains - still, Busto Arsizio is receiving trains during "normal" strikes ('sciopero bianco') - the maximum delay is normally only a few hours.

#### **Shortage of capacity:**

A shortage of capacity means that there is a lack of availability of wagons which happens only in certain periods of the year (summer holidays, winter holidays) but the shuttle trains are handled with high priority, so there is a very low (almost nil) percentage of trains affected by shortage of capacity.

#### **Tracking and tracing systems:**

The on-time delivery of the shuttle trains is excellent and only in very rare cases delays can occur by incidents on the transit routes.

For 99 % of the trains the data is available, at least as far as on-time delivery is concerned. In addition there is an on-line data exchange with hupac in Busto Arsizio who can give the location of the swap bodies.

#### **Cost:**

Due to the ever increasing price for the railway part of the calculation this transport mode loses competitiveness versus road. In addition you can carry already more than 25 t payload on the new generation of trailers, thus shortening the distance (advantage) to the swap bodies 28 to payload. However, shuttle trains are the most competitive alternative to transport and a very nice example for best practice in European Intermodal transport. For this route the intermodality is competitive versus road transport only when the shipper can load the swap-body at the maximum authorized payload (28 tons), in reality it doesn't happen always and this is the reason for having a variable performance score.

### **Shuttle train Munchen (DE) - Verona (IT) \_\_\_\_\_ 3.5**

#### ***Service description (Operator: Kombiverkehr)***

route: Munchen - Verona - Munchen

Since shuttle train basically are used to be operated by the

same number of wagons each departure, this service ensures 100 % capacity all the time.

### **Service specifications**

- ❖ Two trains per day Munchen - Verona  
cut off time: 20:15 and 21:00 day A  
(one train at 11:45 on Saturdays)  
time of availability : 6:30 and 7:30 day B  
(6:30 on Mondays)
- ❖ Two trains per day Verona - Munchen  
cut off time : 18:45 and 19:30 day A  
(one train at 11:00 on Saturdays)  
time of availability : 5:30 and 6:10 day B  
(5:00 on Mondays)
- ❖ Third train p.d. by request
- ❖ in Munchen : booking until 12:00 hrs at the day of departure

### **Performance Indicators**

#### **In time performance at the shipping site:**

The majority of shipping sites are located within a distance of about 60 Km from the terminal Munchen-Riem. The forwarder using the intermodal block train services has deployed dedicated road vehicles so that he can serve the shippers on time.

#### **In time performance at the receiving site:**

The receiving sites are located within a distance of up to 200 Km from the terminal in Verona. As for shipping site, the forwarder has deployed dedicated road vehicles. In case of train delays the local trucking operator receives an early notice by the intermodal operators involved.

#### **Flexibility:**

Shipment peaks and demand fluctuations can be met by hiring additional intermodal equipment (i.e. swap-bodies). Moreover, the train capacity can be increased within a very short time (c. 24 hours) by about 50% running a third daily train.

**Efficiency at the shipping terminal:**

Since the terminal Munchen-Riem is operated very effectively, the loading units are moved from road to rail well below 30 minute during off-peak hours with only few exceptions.

**Efficiency at the receiving terminal:**

About 15% of all loads are not moved from rail to road within 30 minutes. This is owing to the increased transport volume that exceeds the terminal capacity and to industrial disputes deteriorating an effective handling.

**Rail service performance:**

Basically this service is operating almost on time. Only in the case of industrial disputes with the Italian railways, trains have been delayed.

**Shortage of capacity:**

Owing to the enormous day-to-day fluctuations of demand a shortage of capacity has been observed on the peak days of the week.

**Tracking and tracing systems:**

Since the intermodal operators Cemat and Kombiverkehr involved in that service provide all necessary operational data via EDI, all transport related informations are advancing the physical transport. For almost 100% of all trains, data on the expected time of arrival and the on-time delivery is available.

**Cost:**

The difference between intermodal and road transport is negligible.

**Performance: -1 / +1 %**

**Shuttle train Turin (IT) - Bari (IT) \_\_\_\_\_ 3.6**

**Service description (Operator: CEMAT S.p.A.)**

route: Turin - Bari - Turin (via Parma) for intermodal onward prosecution to Patras (Greece)

Shuttle Train is running with same number and wagons combination. The capacity is guaranteed 100% at all time.

Peculiarity of this service is the integration and connection through a daily Shuttle Train from Bari to Brindisi allowing the combination of two different types of traffic.

Going southbound the train is full with intermodal traffic to Greece (swap bodies) via Bari, with part of the train used to reposition empty containers from Parma to Brindisi.

Returning northbound the train is full with CTS from Brindisi to Parma with part of the train used to reposition empty swap bodies from Bari to Turin.

### **Service specifications**

- ❖ One departure/day Turin Orbassano at 14:40 day "A" and Parma at 19:00 day "A"
- ❖ Arrival at Bari 6:06 day "B"
- ❖ Capacity 30 CTS swap bodies per train
- ❖ Return 22:50 day "A" from Bari
- ❖ Arrival 9:00 at Parma day "B" and Turin 15:12 day "B"

Shuttle service is operating from Bari / Brindisi and V.V. connecting to main line.

### **Performance Indicators**

Strong point of service is on time departure and arrival. At destination in Bari the train arrive on the quay so that swap bodies can catch the ferry for Patras.

No cost of road traction at Bari. The other part of train from Parma with empty boxes being repositioned is going into an industrial private terminal in Brindisi with no cost of road traction.

### **Flexibility:**

Because in Parma the train is collecting empty equipment there is the flexibility to increase the train laden capacity of swap bodies from Turin on demand by about 30%.

### **Rail service performance:**

This train is part of the Adriatic Rail Corridor. There is no history of delays. Service is safe and environment friendly.

### Cost:

The service is competitive both in cost and transit time for several reasons :

- ❖ Train always laden both ways. Both ways it reposition empties at a marginal costs.
- ❖ Service arrive on quay in Bari and inside factory in Brindisi with no road traction costs.
- ❖ Road traffic with Greece is imbalanced. Intermodal capacity is very much in demand by market.
- ❖ Waiting time for vessel in Bari penalizes more road trucks than rail.

### Shuttle train Fiorenzuola (IT) - Villa S.Giovanni (IT) \_\_\_\_\_ 3.7

#### **Service description (Operator: CEMAT S.p.A.)**

route: Fiorenzuola - Villa S.Giovanni (Sicily) - Fiorenzuola for onward prosecution to Catania (Sicily)

Shuttle Train is running with same number and wagons combination. The capacity is guaranteed 100% at all time.

Peculiarity of this train is the logistics integration of the service with industrial operations at both ends.

Train is loading pallet wide 30' containers loaded with beverages southbound from Fiorenzuola, and returning northbound with the same containers loaded with plastic material.

#### **Service specifications**

- ❖ One departure per day
- ❖ Departing from Fiorenzuola 22:30 day "A"  
{Shuttle train are operating from
- ❖ Arrival to Villa S.Giovanni 19:00 day "B"  
{Villa S.Giovanni to Sicily via FS
- ❖ Returning from Villa S.Giovanni 11:45 day "A"  
{ferry across the Messina straight
- ❖ Arrival to Fiorenzuola 07:30 day "B"  
{to Catania within 12 hours.



### Performance Indicators

All containers southbound are immediately emptied in Catania into a distribution depot for subsequent retail distribution to shops and supermarkets in Sicily.

The same containers are sent in the same train configuration into an industrial plant for immediate reload with plastic material. No road traction costs are sustained by the containers in both cases.

Containers northbound arrived in Fiorenzuola are offloaded on the ground if they contain product in bulk. If the product is palletized the containers are emptied in a warehouse inside the terminal.

Road distribution is within max 100 Km. Radius. One truck can perform more than one delivery per day.

Empty CTS are then reloaded with beverage in factories within 30 Km. Radius from Fiorenzuola.

Shuttle truck performing several pick ups per day are going backwards and forwards from the terminals.

### Rail service performance:

Within the last year, delays have never exceeded one hour either end. Transit time

within 24 hours for that distance is excellent. Service is safe and environmentally friendly.

### Terminal Efficiency:

The terminals are either industrial plants or logistics platform. They coincide therefore with actual origin or destination of the cargo.

### Capacity:

Quantities of containers used and loaded are daily fixed between the Partners.

### Cost:

The service is competitive with other modes (Road - Ferry) both in transit time and costs.

All Partners in this transport initiative being three major industries are aware of the intermodal cost paid by the others.

Cost is very competitive since road traction either end

does not exist, or exist for a very limited mileage with multiple pick ups are achieved.

### Shuttle train Muizen (BE) - Gallarate (IT) \_\_\_\_\_ 3.8

routes: Benelux (Muizen) - Italy (North / Gallarate) - Benelux

The service is based on the full control over the equipment and infrastructure. Private terminals are strategically located so the trains do not pass any major station in Belgium nor in Italy. The routing of the main train connection between Muizen and Gallarate runs via Luxemburg, France and Switzerland.

In case of problems in France, trains can be diverted via Germany, or swap bodies can be shipped on the daily Ambrogio trains which depart from the private German terminal in Neuss.

#### Service specifications - (Operator: Ambrogio)

- ❖ Transit time for intermodal transport, Benelux - Italy (North): A - C/D
- ❖ Transit time for intermodal transport, Italy (North) - Benelux: A - C/D
- ❖ Transit time for intermodal transport, Benelux - Barcelona: A - C/D

Day A being the loading date, so e.g. if A = Monday then the delivery is on Wednesday.

The actual arrival/departure time of the train is around midnight. Hence minor delays in the trains transit times are easily absorbed without any implications on the door-to-door service.

Standard lead-time consists of 24 hours, i.e. the order is preferably placed at least one day prior to the loading date. However, if required it is always possible to load the same day in Benelux. As the trains leave Muizen terminal at 7:00 pm, orders can be loaded throughout the day and still depart the same day.

The system provides the possibility of pre-loading (also called 'mobile warehousing'): orders available for loading can be loaded 'x' days in advance of the normal shipping date, respecting the exact delivery date. The pre-loaded trailers can be stored on either one of Ambrogio secured terminals.

### **Communication**

Orders are collected via fax, E-Mail and EDI. Each swap body has a unique ID number, so information can be obtained at any time during the shipment, *including the railway section*.

### **Security**

As the Ambrogio system consists of a closed circuit (i.e. no chartering and full ownership of infrastructure and equipment), only authorized people have access to sensitive information.

Upon arrival on private terminals (24 hours surveillance), the swap bodies are immediately put on railways wagons rendering theft impossible.

Each swap body remains on railways wagons until the assigned driver picks it up for delivery. The documents are handed over to the drivers as they leave the terminal.

In case of need, deliveries in Italy are carried out using trucks equipped with satellite tracing devices.

### **On time loading & delivery**

Internal quality standard prescribes the commitment to ensure the availability of equipment on a 'non-refusal' basis. On time loading and delivery are always provided within the boundaries set in the standard instructions and transit time. For the exceptions, ad hoc solutions are timely proposed to the users.

### **Quality control**

Actual delivery dates as well as details on non-conformities are registered per shipment and form the basis data for tailor-made performance reporting systems. Internally, regular company meetings provide the platform to evaluate performances and discuss possible actions for further improvements.

## Conclusions

In the recent past in spite of the interest shown by the Industry on intermodal solutions, the road traffic continued to grow. It's clear that the required flexibility and reliability in the door-to-door operations and the speed of movements are contributing to the road transport expansion. However it is also a given that the road transport expansion is extremely facilitated by a not equivalent increase of service quality in rail / intermodal transport.

Today, as the Working Group pointed out, the intermodal transport is only a little portion of the total traffic in Europe and the real opportunities to effectively use it ('Best Practices') are mainly limited to Shuttle Trains on the existing TERFFs.

This current situation is creating in the shipper community a **reduced confidence on the intermodal transport system as a viable solution to the increased road transport issues**, consequently the gap between the expected development of this transport mode and the real use of it is becoming bigger and bigger.

In the current scenario we can identify the following key elements determining success or failure in Intermodal Business.

Elements contributing to a good intermodal service are in some respect the same as in any other business, like personnel quality, good communication technology, high response to customers' information needs. In other respects they may be peculiar to intermodal business, like a sizeable fleet, allowing flexibility in response to demand peaks and hollows, which is very often the case in the commodity trade. To keep a large fleet of intermodal units is far less expensive than affording an equal fleet of trucks & trailers. A smaller dependence on cycles is a strong advantage for intermodality. The weekly cycle is a limit for a trucker, who can hardly afford to stay out over the weekend and tends to load and depart in the first half of the week. Intermodal operators can operate from Monday to Saturday on a perfectly equal basis. Summer holiday cycles and year-end cycles too are better tackled by intermodality. Demurrage cost of an intermodal unit is far less costly than for a truck & trailer, due to the absence of a driver. This allows the inter-

## 4.1 4. Conclusions & Recommendations

modal operator to easily follow a specific customer planning, asking for picks-ups or deliveries spread over several days at different hours at no or very little extra cost. Finally it may be mentioned that running and maintaining a fleet within a limited radius from the rail terminal is far less expensive than taking care of a fleet running through Europe.

**Taking for granted that all the above is assured, this still will not provide an efficient system if you are not in control of the most important product of all, that is the train itself.** By control we mean all that influences the cost of the train and the service available to the customer, who is not the carrier jumping on the train, but the shipper (industry) using the carrier who jumps on a train.

Train control, from a customer oriented point of view, means in short the ability to divide and spread different loads over different trains, according to delivery time requirements. So for example the last arrived unit on the terminal may depart whereas a unit sitting there one or two days may still be withheld.

**Train control from a technical and cost efficiency point of view, is a more tricky business but this is the main success key in any intermodal operation.**

The best possible and most efficient use of a train is, theoretically, to exploit its maximum length achieving at the same time the maximum allowed weight.

A train based on steel traffic will easily reach the tons limit, but shall 'waste' one third or more of its length. Same will happen to trains with a high concentration of tank units, notoriously short and heavy. The opposite shall occur to a train carrying empty units, the length is easily reached but tons capacity is wasted away.

This is by and large, the most important single factor affecting intermodal efficiency, productivity and cost.

Terminal efficiency for instance, is very much in discussion, mainly by truckers who do not like to stand waiting in a queue, or do not like to pay parking fees when they don't pick up their units on time. All this is right, but even the best terminal operation will not save the operation if the main product i.e. the train is too expensive.

One other all too evident aspect is road traction for pick-

ups and deliveries. We need only say that here the full vs. empty km ratio must be acceptable and profitable. Back to train, we might say that in a perfect railways, they could combine, not giving up punctual service, different traffics on the same train, even combining different products. Half a train of steel rolls special railcars could join half a train of automobile carrying flatcars, thus reaching a perfect weight/lenght combination.

All this though, today, is still just daydreaming, unfortunately.

By now **it has already become clear that you cannot do so unless you control the whole transportation chain, starting by a direct sale of a door-to-door service.** This in turn affects the strategy, and the only positive examples of intermodal transport are those reflecting the train-oriented marketing strategy combining all kind of traffics that contribute to the making of a good train. In this case, maybe only in this case, intermodality can become profitable.

Public intermodal service, such as provided by UIRR companies, while performing a series of other important duties, mainly giving access to operators not large enough to set up their own system, are forced to some limitations. As they do not control traffic acquisition at the source, this being in the hands of individual carriers/customers, they cannot perform daily train flexibility, but tend rather to work with shuttle trains, which guarantee optimal schedule and regularity, but are not always the best weight/length combination, being mostly formed by a set number of railcars.

## Recommendations 4.2

When establishing the Best Practices the Working Group has at the same time been able to conclude on elements in the intermodal chain which has to be improved in order to enable intermodal transport to achieve the development wishes from all sides.

In the most important intermodal transport, the rail / road transport with containers, swap bodies and semi-trailers,

the railway traction seems to be the most problematic element, both from the cost and quality point of view. The existing railway freight enterprises - all pressed to deliver positive financial results as a consequence of the privatisation or Directive 440/91 - offer no longer market oriented traction prices and the rail products have no longer the speed and reliability which the market demands.

It does not help to put more pressure on the existing railway enterprises. They have to pay increasing infrastructure fees for intermodal trains, which on their side have to cover all its costs.

If this fact is not recognised by the EU-Commission and the Ministers of Transport within EU and CEMT and if this fact is not taken into account by changing the Directive 440/91 and its implementation, intermodal transport will end up as a niche in the transport picture.

As a supplement to the fundamental change in the intermodal environment, the industry itself should focus on the following elements :

Improved surveillance and information regarding the exact position of the intermodal units

More effective and flexible terminal handling of the units, building up hub and spoke systems with modern equipped terminals and/or marshalling yards as basis

Cost effective road transport to and from terminals

Investment in modern, standardised units (containers, swap bodies, railway wagons and chassis)

In the short run confidence in intermodal transport has to be re-established.

### 4.3 Working Group next steps

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This Report summarizes the results of the analysis conducted by the Working Group on the Best Practices on Intermodality in Europe. The Working Group agreed to close this preliminary phase of the study and present this material as the basis for further joint study with the USA team.

*Summary of the  
Final Report  
presented to the  
F&L General Meeting*

*21<sup>st</sup> May 1999 in Berlin*

*by Mr. Vitale  
Chairman of the Working Group*



# ***WORKING GROUP***

## **BEST PRACTICES ON INTERMODALITY - JOINT EU/USA -**

## WORKING GROUP MEMBERS

<b>R. VITALE</b>	<b>- PROCTER &amp; GAMBLE / CHAIRMAN</b>
<b>S. RASMUSSEN</b>	<b>- INTERCONTAINER / VICE CHAIRMAN</b>
<b>J. ANDRIESSEN</b>	<b>- PHILIPS</b>
<b>A. BENNETT</b>	<b>- EWS</b>
<b>G. BOSCHETTI</b>	<b>- SAIMA AVANDERO</b>
<b>P.M.A. BLOEMENDAAL</b>	<b>- NEDLLOYD</b>
<b>K. ISZLAY</b>	<b>- HUNGAROCAMION</b>
<b>H. BORTOLOTTI</b>	<b>- LKW WALTER</b>
<b>W. MAYWALD</b>	<b>- KOMBIVERKEHR</b>
<b>G. MARTA</b>	<b>- GYSEV</b>
<b>N. DE RAADT</b>	<b>- SEA-LAND</b>
<b>E. PEETERMANS</b>	<b>- SNCB CARGO</b>
<b>M. SOLLMANN</b>	<b>- VOEST ALPINE</b>
<b>W. SHUMACHER</b>	<b>- RHENANIA</b>
<b>R. SVENSSON</b>	<b>- VOLVO TRANSPORT</b>
<b>K. VANROYE</b>	<b>- EUROPEAN COMMISSION</b>

## **W.G. OBJECTIVES / STATUS**

**ANALYSE MARKET REQUIREMENTS**

**IDENTIFY 'BEST PRACTICES' IN EUROPE**

**COMPARE THE STATUS IN EUROPE AND USA  
AND  
EXPLORE OPPORTUNITIES FOR COOPERATION**

## W.G. OBJECTIVES / STATUS

ANALYSE MARKET REQUIREMENTS



IDENTIFY 'BEST PRACTICES' IN EUROPE



FINAL REPORT

## **MARKET REQUIREMENTS**

**THE SHIPPERS AIM TO SELECT THE TRANSPORT  
MODE IN A FREE COMPETITIVE MARKET**

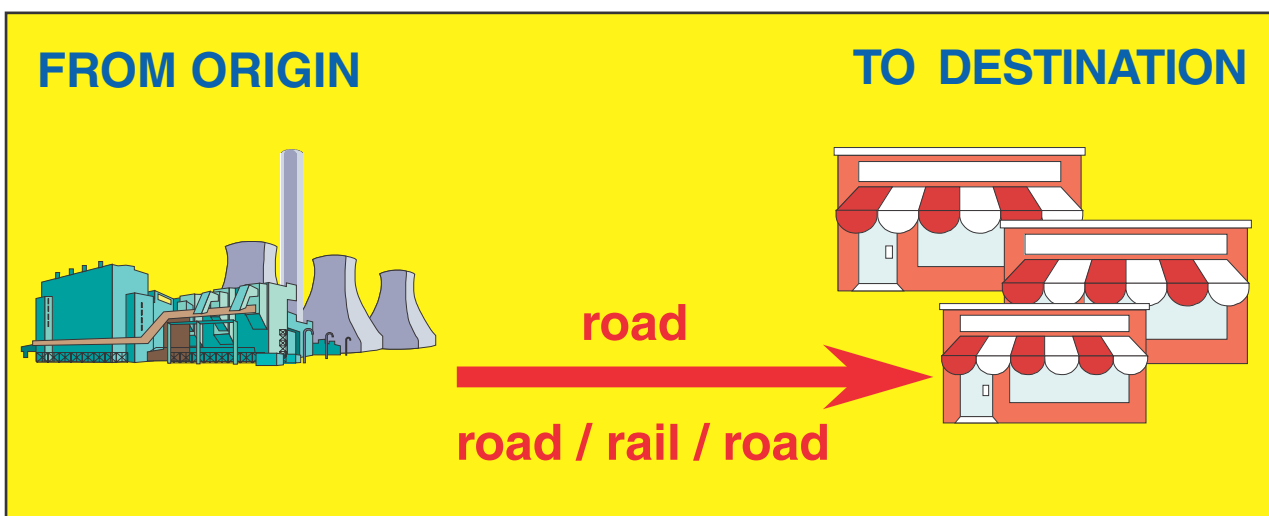
**INTERMODALITY IS IN COMPETITION WITH THE  
OTHER TRANSPORT MODES**

**(MAINLY ROAD AS REFERENCE FOR  
CONTINENTAL TRAFFIC)**

**COMPETITIVENESS = SERVICE + COST**

## **MARKET REQUIREMENTS**

### **DOOR-TO-DOOR SERVICE**



## WHAT DOES 'BEST PRACTICE' MEAN?

- DEFINE SERVICE PERFORMANCE CRITERIA
- MEASURE REAL CASES OF INTERMODAL TRANSPORT
- PRESENT THE EXAMPLES SHOWING THE HIGHEST PERFORMANCE

## HOW CAN WE IDENTIFY THE 'BEST PRACTICES'?

### PERFORMANCE INDICATORS

#### IN TIME PERFORMANCE AT THE SHIPPING & RECEIVING SITES

pick up/delivery goods according to shipper/  
customer requirements

#### FLEXIBILITY

meet demand fluctuations/shipment peaks

#### EFFICIENCY AT THE SHIPPING & RECEIVING TERMINALS

service reliability, speed, working hours,  
flexibility etc.

## **PERFORMANCE INDICATORS**

### **RAIL SERVICE PERFORMANCE**

departure and arrival on time / actual  
performance vs schedule

### **SHORTAGE OF CAPACITY**

availability of equipment at the shipping  
terminal

### **TRACKING & TRACING SYSTEMS**

availability of data

### **COST**

intermodal transport cost vs road

## **'KEY PLAYERS' INVOLVED IN THE STUDY**

**MANUFACTURERS / SHIPPERS**

**INTERMODAL OPERATORS**

**FORWARDING AGENCIES**

**TERMINAL OPERATORS**

**RAILWAY COMPANIES**

**CARRIERS**

## ***BEST PRACTICES ON INTERMODALITY***

**COLOGNE (DE) - BUSTO ARSIZIO (IT)**

**MUNCHEN (DE) - VERONA (IT)**

**GALLARATE (IT) - MUIZEN (BE)**

**ANTWERPEN (BE) - BASEL (CH)**

**OLOFSTROM (SE) - GENT (BE)**

**TURIN (IT) - BARI (IT) - PATRAS (GR)**

**FIORENZUOLA (IT) - VILLA S. GIOVANNI (IT)**

## ***OUTCOMES OF THE ANALYSIS***

**REDUCED USER CONFIDENCE ON  
INTERMODAL TRANSPORT**

# ***WHY ?***



## **OUTCOMES OF THE ANALYSIS**

**SINGLE SHIPMENTS / LOADS ARE EXTREMELY DIFFICULT TO MANAGE, ONLY THE AGGREGATION MAKES INTERMODAL COST EFFECTIVE AND RELIABLE**

**INTERMODALITY IS CURRENTLY QUANTITY-SENSITIVE**

**‘SHUTTLES’ & MULTI-CUSTOMERS BLOCK TRAINS ARE THE MOST PROMISING WAY TO OFFER GOOD SERVICE TO THE FINAL USERS**

## **OUTCOMES OF THE ANALYSIS**

**RAILWAY FREIGHT ENTERPRISES ARE PRESSURED TO DELIVER POSITIVE FINANCIAL RESULTS (DIR. 440/91) AND DON'T OFFER NO LONGER:**

- MARKET ORIENTED TRACTION PRICES**
- SPEED & RELIABILITY**

## **CRITICAL AREAS**

**LACK OF IT SYSTEMS ....**

**PUNCTUAL & RELIABLE INFORMATION**

**TERMINALS AS BOTTLE NECKS ....**

**IMPROVE PERFORMANCE**

**WIDE RANGE OF TECHNIQUES/EQUIPMENT ....**

**STANDARDIZATION**






**HIGH COST IN MOVING LOADS BETWEEN MODES ....**

**EFFECTIVENESS**

**RAIL RELIABILITY ....**

**MANAGE CO-EXISTENCE OF PASSENGERS &  
FREIGHT TRAFFIC**

## **RECOMMENDATIONS**

-  **TUNE DIRECTIVE 440/91 AND ITS IMPLEMENTATION**
-  **IMPROVE THE INTERMODAL UNITS CONTROL**
-  **INCREASE EFFECTIVENESS AND FLEXIBILITY IN THE TERMINALS**
-  **IMPROVE COST EFFECTIVE ROAD TRANSPORT TO AND FROM TERMINALS**
-  **FOCUS ON STANDARDISED UNITS**

# **CONFIDENCE IN INTERMODAL TRANSPORT HAS TO BE RE-ESTABLISHED**

## ***WORKING GROUP NEXT STEPS***

**THE WG AGREED TO CLOSE THIS PRELIMINARY  
PHASE OF THE STUDY**

**THE REPORT IS THE BASIS FOR FURTHER JOINT  
ANALYSIS WITH USA**



AD INTERIM OFFICE

EUROPEAN FREIGHT & LOGISTICS LEADERS CLUB

Via C. Ravizza, 4  
20149 Milano / Italy  
Tel. +39-02-480.191.51  
Fax +39-02-433.693  
E-mail: felclub@ats.it



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