

SHORT SEA SHIPPING And COMBINED TRANSPORT BETWEEN TURKEY and EUROPE:



“AN INNOVATIVE APPROACH FOR SUSTAINABLE INTERMODAL TRANSPORT”

Candidate For : 2005 European Intermodal Association (EIA) Awards

Category : Best intermodal transport or freight integration service from A to B



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Turkey, Istanbul
October, 2005

***"One rarely recognises, what has already been
achieved; the focus
is always on, what is left to be done".***

Marie Curie, French Nobel laureate

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Foreword and a Word of Thanks

“Time to Implement !... .”

“At the dawn of the 21st century, European transport systems must confront a serious modal imbalance which has favored the development of the most polluting and congested modes of transport. This requires a change of strategy in the Common Transport Policy which puts users at the centre of the system guaranteeing their right to efficient, safe, affordable and environment-friendly transport.

The White Paper (2001) on Transport: “Time to Decide” is a strategic document setting out over 60 measures designed to promote clean, energy-efficient modes of transport such as rail, inland waterways and short sea shipping, which would ensure the balanced development of road transport by encouraging intermodality.

Europeans deserve an efficient transport system which offers them a high level of quality and safety: the White Paper lays the foundations for more rational and imaginative use of the different modes of transport and transport infrastructure”⁽¹⁾

The Intermodal project described and implemented herein, derives its main source of strength from what has been inscribed in the White Paper and does just that as far as the recommendations/suggestions are concerned.

We believe that transport is an indispensable part of our daily life and our economy in general. While being so, it is lately considered as a nuisance (perhaps rightly in a certain content) by the environmentally conscious constantly demanding a better service which is foremost clean, efficient, fast, reliable, safe and non-contributing to the already existing congestion.

From a transport stakeholders perspective providing service to the industry, this imposes a multi dimensional problem. Not only they need to take into consideration to tackle the aforementioned constraints, they also need to create added value (economically) for their own enterprises. The solution therefore is a complex one, yet possible. Over a period of a decade, we dedicated ourselves to provide an answer to all those constraints and believe that we have achieved a unique solution.

(1): (quote from press release).

This paper briefly describes the evolution of such a unique solution and hence the success achieved over the said period.

Numerous unnamed heroes have taken very important roles and contributed immensely for the realization of this project. And we would like to extend our sincere thanks for each and every one of them.

Among such people are, our shareholders, our clients who believed and encouraged us at all times, criticized us with their vigorous and yet positive comments, the Board of Directors of our Institution and the Ro-Ro companies, particularly our Chairman – a true leader in all sense, our management team who is doing a wonderful job, the Masters of our Vessels who have worked diligently day in day out in tough weather conditions, Chief Engineers, second engineers, the shipping crew in general, the shipping agencies on both legs providing a very efficient service for the timely departure of our vessels, the airline operator company who has been with us for more than a decade and who performed a superb service for the transfer of our drivers, the land service personnel, the company responsible for the construction of our vessels for building state of the art vessels, not forgetting the shipyard working crew, who have worked day and night for the just in time delivery of our vessels, to our creditors who trusted us at all times, our new rolling motorways service provider who contributed so much for this project in order to achieve an integrated and seamless intermodal line .

Last but certainly not least, a word of sincere thanks goes to our politicians and bureaucrats. All the governments over the past decade have provided an enormous amount of political support for the enhancement of this project. The bureaucrats on the other hand, working in The Ministry of Transport, The Ministry of Internal Affairs, The Customs Under secretariat, The Maritime Under secretariat, The Under secretariat for Foreign Trade and so many other governmental institutions who were involved deeply in the development of the project and who contributed dearly, for without their constant support and encouragement, we could not have been where we are now.

But much has to be done yet. There is still a lot work to be accomplished. We are constantly seeking for ways and means to offer an even better service towards our clients.

But then, as the French Nobel prize winner Marie Curie quoted: *“One rarely recognizes what has already been achieved, the focus is always on; what is left to be done”*

Chapter 1: Product (Service) Description

Section 1.1 Company Profile(s)

RODER IKT. ISL. (RODER) is an economic enterprise founded on 28 November 2001 for the purpose of developing and further enhancing combined transport and short sea shipping services in Turkey. Its main line of activity lies in the field Intermodal Transport and providing various services to the transport industry through participations. It has led to the formation of a number of commercial undertakings (Such as RODPA Marketing Inc., RODER Vehicle Inspection Services Inc., RODER Insurance Services Ltd.) within the group of companies and actively participates in them.

UN Ro-Ro Group of Companies are service providers in the field of Short Sea Shipping. The original company was established in the year of 1994 for the purpose of providing Ro-Ro services from Turkey to Italy. The present Ro-Ro vessels operating on the Istanbul – Trieste line and the new Ro-Ro terminal (Pendik) are owned and operated by the same group of companies. The company was later enlarged through the formation of other Ro-Ro companies as a result of inclusion of further vessels in the line.

Section 1.2 Introduction of a Ro-Ro Line between Turkey and Europe; Brief History:

The introduction of a Ro-Ro Line between Turkey and Europe dates back as early as the beginning of the 1990's and coincides with the internal conflicts that had taken place in the former Yugoslavia.

Towards the end of 1992, the state of such conflict and the resulting clashes reached such a high level that it was no longer possible for Turkish vehicles to transit from this territory. Considering that this country was a major gateway for Turkey's exports to Europe (by road), transport operations suffered a great deal and almost came to a virtual halt.

Alternative transit routes (through Romania and Hungary) were soon introduced, but the facilities were nonetheless far from adequate since the infrastructure facilities offered by these countries (border crossings, road conditions etc.) were not in a position to handle the huge traffic arriving from Turkey as well as other surrounding countries. Additionally, transit over these countries involved the payment of huge amounts Road Charges/Taxes, coupled with lack of Transit Road permits, as per the so called Quota systems applied between countries on a bilateral basis.

Faced with the reality of being incapable to trade with the rest of Europe, these set of constraints were been shared by the decision makers who too were seeking alternative solutions.

It was then a visionary group of International Transport Operators (48 in total), who came together in the year of 1994 and formed a Ro-Ro Operator Company (UN Ro-Ro Inc.) with the purpose of transshipping Heavy Goods Vehicles (HGV's) from Turkey to Europe through the ports of Turkey and Trieste – Italy.

What was formed by a small group of people and few vessels, today turned out to be a major key player in Short Sea Shipping and Combined Transport not only in the Mediterranean region but in the whole of Europe.

That vision, created almost a decade ago and developed continuously, is today implemented with great success and constitutes a pure Intermodal line between Turkey and the rest of Europe. The line is considered to be the first in the Mediterranean area while being ranked as 3rd in the European continent so far as the service is concerned and the lane meters offered for use in the industry. With the formation of subsequent Ro-Ro Companies, state of the art type of vessels are employed in the line, while the number of shareholders (who happen to be all Transport Operators) rose to 210 and the concept of “**users at the centre of the system**” is transformed into reality.

The diversity of demand particularly from the point of the users (for services rendered) soon called the need for additional lines to be established. Today, 6 Ro-Ro vessels are operating between Pendik (the newly built and owned Ro-Ro terminal at the Asian side of Istanbul) and Trieste, 3 vessels are put into service between Ambarlı (the Ro-Ro terminal located at the European side of Istanbul) and Trieste as well as 3 vessels operating between Çeşme (İzmir) and Trieste bringing the total to 12 vessels capable of carrying more than 180.000 vehicles per year in both ways.

The line, was soon adopted as a prime example in other regions such as the Black Sea where today, Ro-Ro vessels are operating between the ports of Samsun (Turkey) and Novorossysk (Russian Federation) as well as Zonguldak (Turkey) and Evpatoria (Ukraine) carrying well over 20.000 Heavy Goods Vehicles annually.

Section 1.3 The “Product” (Service)

The process developed in the present Intermodal Line (Pendik/Ambarlı/Çeşme -Trieste) and is implemented currently, is Short Sea Shipping **plus** Combined Transport. Not only, it is carried out in a pure intermodal environment, it encompasses various logistical techniques and tools which

makes it unique on its own. In this context, it is essentially a **package deal** where goods are transported from one end (point of departure) to the other (point of destination), making use of different transport modalities without the need for handling of the goods themselves.

Below is an abstract description of the **product**:

Goods are picked up from various inland locations of Turkey where they are carried to one of our Pendik/Ambarlı/Çeşme Ro-Ro terminals with vehicles. Such vehicles are either articulated type of (we call them Complete Units as the tractor and semi-trailer are coupled) or just semi-trailers (load carrying compartments of vehicles) In case of transshipment of semi-trailers only, the tractor of the complete unit is left behind and semi-trailers are boarded onto the vessel. This portion of the journey constitutes the **Road Transport leg.**

Having concluded the exit customs formalities at one of the Pendik/Ambarlı/Çeşme Ro-Ro Terminals, the vehicles (complete units and/or semi-trailers) are then boarded onto our Ro-Ro vessels and transshipped over to Trieste. The distance from Pendik to Trieste is around 1.150 sea miles, from Ambarlı to Trieste is 1.137 miles whereas from Çeşme to Trieste is 942 miles. Sailing time on average takes around 54-56 hours in case of a Pendik departure, 60-62 hours in case of Ambarlı departure, and 60-62 hours in case of departure from Çeşme all depending on weather conditions. There are 7 departures from Pendik per week such departures being affected everyday. Ambarlı departures are scheduled on a 3 days departure per week (Wednesday, Friday and Saturday) whereas Çeşme departures are again based on a 3 days per week. (Wednesday, Friday and Sunday) The round trip journey (Pendik - Trieste – Pendik) including loading and unloading of the vehicles takes a total of 6 days. In case of departures from Ambarlı and Çeşme the port to port time is similar. This implies that on certain days there are more than one vessel berthing in and departing from Trieste. This imposes no problem as a certain part of the port of Trieste is dedicated for our Ro-Ro operations. This portion of the journey constitutes the **Short Sea Shipping Leg.**

Once disembarkation of the vehicles from the vessels are concluded and customs formalities for entrance to EU territory are finalized, a significant portion of the vehicles are then boarded on trains (the rolling motorway - ROLA) departing from Trieste to Salzburg of Austria. The trains are capable of carrying 20 vehicles and the journey takes 9 hours. There are 3 daily departures on most of the days of the week from Trieste to Salzburg and vice-versa. This portion of the journey constitutes the **Combined Transport Leg.**

The trucks then disembark from trains at Salzburg and continue on their journey till to final destination via Road. In case of semi-trailers, these are coupled with the Tractor units located at the Trieste Port vicinity. (A special area

is designated for tractor units for this purpose) This portion of the journey again constitutes the **Road Transport Leg.**

If one considers the transfer of drivers via Air Transport (dedicated flights for drivers only, departing daily from Istanbul to Ljubljana-Slovenia and vice versa and then carried onwards to Trieste by buses), the system can really be considered as **to employ all transport modalities available.**

Chapter 2: Operational Facts, Figures and relevant Commentary

Section 2.1 Ro-Ro Fleet Configuration:

Table 1 below illustrates the current configuration of the Ro-Ro vessels operating in the Pendik/Ambarlı/Çeşme – Trieste line.

Vessel Name	Employed in	LoA (meters)	Lane Meter	Gross Tone	Capacity (Vehicles)	SPEED (KNOT)
Un Ege	Pendik-Trieste	193	3.214	22.900	200	21,6
Un Adriyatik	Pendik-Trieste	193	3.214	22.900	200	21,6
Un Atılım	Pendik-Trieste	193	3.214	22.900	200	21,6
Un Birlik	Pendik-Trieste	193	3.214	22.900	200	21,6
Un Marmara	Pendik-Trieste	193	3.735	29.004	230	21,5
Saffet Ulusoy	Pendik-Trieste	193	3.735	29.004	230	21,5
Un Denizcilik	Ambarlı-Trieste	183,1	2.060	21.213	130	19
Un Hayri Ekinci	Ambarlı-Trieste	183,1	2.060	21.213	130	19
Un Karadeniz	Ambarlı-Trieste	193	2.640	22.900	165	21,6
Ulusoy 6	Çeşme-Trieste	163,5	1.669	12.259	105	15,5
Ulusoy 5	Çeşme-Trieste	163,8	2.760	19.689	145	16
Saffet Bey	Çeşme-Trieste	163,8	2.760	19.689	145	16

Table 1: Current Configuration of the Ro-Ro vessels operating in the Pendik/Ambarlı/Çeşme – Trieste Line

Source: UN Ro-Ro Group of Companies, 2005

Two more vessels (**UN Pendik, UN Trieste**) each with capacities of 240 Trailers shall be introduced to the line during the end of October 2005 and in the beginning of 2006. Picture 1 shows the launching ceremony of *UN Pendik* on 12 August 2005.



Picture 1: Launching Ceremony of UN Pendik, 12 August 2005

Source: UN Ro-Ro Group of Companies, 2005

Section 2.2 Time Schedule of Operations:

Table 2 below shows the current time schedule of operations of the vessels departing from Pendik – Ambarlı - Çeşme and from Trieste.

Vessel Name	Departing		Arriving		Departing		Arriving	
	From	On	To	On	From	On	To	On
UN Marmara	Pendik	Monday (24:00 Hrs)	Trieste	Thursday (06:00 Hrs)	Trieste	Thursday (18:00 Hrs)	Pendik	Sunday (00:00 Hrs)
Saffet Ulusoy	Pendik	Tuesday (24:00 Hrs)	Trieste	Friday (06:00 Hrs)	Trieste	Friday (18:00 Hrs)	Pendik	Monday (00:00 Hrs)
UN Atılım	Pendik	Wednesday (24:00 Hrs)	Trieste	Saturday (06:00 Hrs)	Trieste	Saturday (18:00 Hrs)	Pendik	Tuesday (00:00 Hrs)
UN Ege	Pendik	Thursday (24:00 Hrs)	Trieste	Sunday (06:00 Hrs)	Trieste	Sunday (18:00 Hrs)	Pendik	Wednesday (00:00 Hrs)
UN Adriyatik	Pendik	Friday (24:00 Hrs)	Trieste	Monday (06:00 Hrs)	Trieste	Monday (18:00 Hrs)	Pendik	Thursday (00:00 Hrs)
UN Birlik	Pendik	Saturday (24:00 Hrs)	Trieste	Tuesday (06:00 Hrs)	Trieste	Tuesday (18:00 Hrs)	Pendik	Friday (00:00 Hrs)
UN Marmara	Pendik	Sunday (24:00 Hrs)	Trieste	Wednesday (06:00 Hrs)	Trieste	Wednesday (18:00 Hrs)	Pendik	Saturday (00:00 Hrs)
UN Denizcilik	Ambarlı	Wednesday (24:00 Hrs)	Trieste	Saturday (12:00 Hrs)	Trieste	Saturday (24:00 Hrs)	Ambarlı	Tuesday (12:00 Hrs)
Hayri Ekinci	Ambarlı	Friday (24:00 Hrs)	Trieste	Monday (12:00 Hrs)	Trieste	Monday (24:00 Hrs)	Ambarlı	Thursday (12:00Hrs)
UN Karadeniz	Ambarlı	Saturday (24:00 Hrs)	Trieste	Tuesday (12:00 Hrs)	Trieste	Wednesday (24:00 Hrs)	Ambarlı	Saturday (06:00 Hrs)
Ulusoy 6	Çeşme	Wednesday (24:00 Hrs)	Trieste	Saturday (12:00 Hrs)	Trieste	Saturday (24:00 Hrs)	Çeşme	Tuesday (06:00 Hrs)
Ulusoy 5	Çeşme	Friday (24:00 Hrs)	Trieste	Monday (12:00 Hrs)	Trieste	Monday (24:00 Hrs)	Çeşme	Thursday (06:00 Hrs)
Saffet Bey	Çeşme	Sunday (24:00 Hrs)	Trieste	Wednesday (12:00 Hrs)	Trieste	Thursday (24:00 Hrs)	Çeşme	Sunday (06:00 Hrs)

Table 2: Time Schedule of Operations of the Vessels

Source: UN Ro-Ro Group of Companies, 2005

As seen from the contents of Table 2, three vessels are departing from Pendik, Ambarlı and Çeşme on Wednesdays and Fridays and are arriving to Trieste on Saturday and Monday morning and mid day. Similarly, two vessels are departing from Pendik and Ambarlı reaching Trieste on Tuesday morning and midday. Introduction of three vessels for service on Fridays and two vessels on Saturdays stems from the fact that Turkish exporting companies prefer to send their goods to consignees particularly towards the end of the week so that goods will be delivered to them at the beginning of a working week. Note that we are able to perform a daily service from Pendik per week despite the fact that we employ 6 vessels departing everyday. This is because, from Pendik, the round trip is realized in every 6 days. Therefore, a vessel departing say, on a Tuesday from Pendik, shall start its next consecutive voyage on a Monday from the same terminal.

The Ro-Ro route also imposes the advantage for movement of cargo during weekends, where it is inconceivable on the Road route, due to application of road bans on most European countries. This provides a further logistical advantage for our clients (transport operators) to move their cargo on for example, a Saturday or Sunday and deliver the goods to a consignee on a Tuesday.

In the year of 2004, through our Pendik/Ambarlı/Çeşme ports 657 calls were made to the port of Trieste, resulting in an average of 1.8 calls per day.

Section 2.3 Statistical Figures relating to number of vehicles transshipped:

Table 3 refers to the number of vehicles (Complete Units and/or Semi trailers) transshipped (Turkish vehicles + Foreign vehicles) over the last 4 years (2001 – 2004) as per the departure points. (One way)

Line	2001	2002	2003	2004
Pendik^(a) – Trieste	40.568	44.595	54.047	55.606
Ambarlı – Trieste	24.040	18.349	17.040	19.987
Çeşme – Trieste	9.339	12.072	13.898	16.222
TOTAL	73.947	75.016	84.985	91.815

Table 3: Number of Vehicles (Turkish + Foreign) transshipped (one way) between the period 2001-2004

Source: RODER, 2005

(a): Since from the beginning of May 2005, vessels are departing from our newly built and owned Ro-Ro Port Terminal; Pendik. Previously, the departures were affected from another Port in Istanbul called, Haydarpaşa

The service witnessed a consistent growth rate of 24% over the last 4 years. In the year 2005, we expect a further 4-6% growth on the line bringing the total number of vehicles to be transferred to roughly 95.000 vehicles per year. On a round trip scale, this corresponds to a total transfer of **190.000** vehicles annually.

Figure 1 below shows a graphical representation of how the line is developed over a period of a decade since its establishment in the year of 1994.

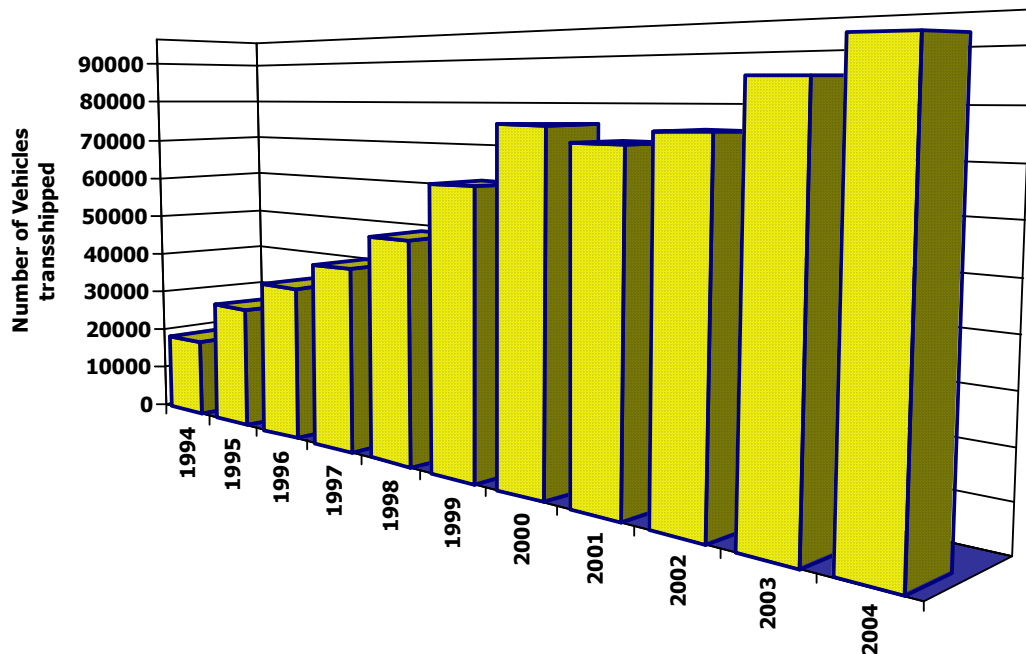


Figure 1: Graphical representation of the development of the Ro-Ro Line during the period 1994-2004

Source: RODER, 2005

During the period 2001-2004, the total of Turkey's exports to the rest of the world in value terms summed 177.4 billion USD.

50 % of this amount (88.7 billion USD) was exported to the following countries of the EU: Germany, Austria, Belgium, France, Netherlands, UK, Ireland, Spain, Portugal, Italy, Luxembourg, Denmark, Sweden and Finland.

The total number of vehicles trips (in export mode) realized to these countries by Turkish vehicles over the said period and reaching Europe through Road and Ro-Ro routes amount to 503.416 vehicles.

Out of the above, 293.576 Turkish vehicles used the Ro-Ro route to reach such countries over the same period.

This implies **58.3%** of the vehicles utilized our vessels over the Ro-Ro route where half of the exports of the country (in value terms) were affected.

Section 2.4 Efficient Transport; Transfer of Semi Trailers:

As the Ro-Ro concept was developed over the years, new perspectives and innovations were introduced to the system. One such concept enhanced, relates to the transfer of Semi - Trailers only. In this mode of transport, Tractor units are located in both ports whereby, only the semi-trailers are boarded onto our vessels. The semi – trailers are then coupled with the Tractor units located on either side, and moved onto their final destinations as complete units.

The complete units (tractor + semi – trailer) are no longer boarded, enabling to increase the capacity of the vessel significantly by up to 20% depending on the boarding ratio. Picture 2 shows the tugging of a semi-trailer from a vessel.



Picture 2: Tugging of a Semi-Trailer from a vessel

Source: UN Ro-Ro Group of Companies, 2004

From a Transport Operators perspective, transfer of Semi – Trailers provide the added advantage for cutting down on operational costs, as well as reducing the capital investment on trucks. Today, a typical transport company involved in semi trailer activity employs as much as half the number of tractors in his fleet when compared to a transport operation involving the transfer of Complete Units.

Table 4 below shows how the transfer semi-trailers developed over the years.

No. of Year	No. of Semi-Trailers	Complete Units	Total	Semi-Trailer Ratio (%)
1997	20.869	21.408	42.277	49,40
1998	26.182	24.147	50.329	52,00
1999	26.796	35.986	62.782	42,70
2000	37.589	38.043	75.632	49,70
2001	38.748	35.199	73.947	52,40
2002	39.833	35.183	75.016	53,10
2003	48.271	36.714	84.985	56,80
2004	52.408	39.407	91.815	57,08

Table 4: Efficient Transport; Transfer of Semi – Trailers

Source: RODER, 2005

Today, almost 57% of the vehicles boarded onto our vessels are composed of Semi – Trailers.

Chapter 3 Intermodal Aspects

Section 3.1 A seamless Intermodal Chain

A seamless Intermodal environment is created for goods from the point of departure till to the point of destination, incorporating the following transport modes:

Road Transport (in the initial and final legs of the operation), Sea Transport (Short Sea Shipping - SSS) and Railways Transport. (Combined Transport - CT)

The project supports the general objectives of sustaining mobility with reduced congestion, reduced environmental impact and enhanced safety while creating added value for users in terms of operational and depreciation costs as well as a reliable and fast service. Figure 2 below briefly illustrates the flow of goods.

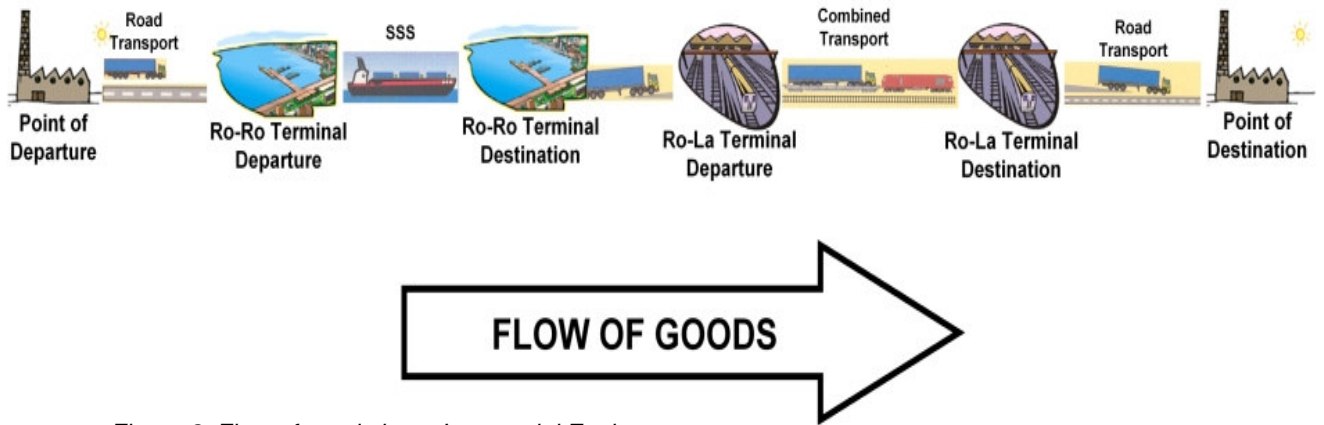


Figure 2: Flow of goods in an Intermodal Environment

Source: RODER, 2005

Sub Section 3.1.1 Short Sea Shipping



The Short Sea characteristic of the Intermodal line from Turkey to Europe, involves not only the carriage of HGV's, but also serves for the transshipment of other types of cargo (called free cargo) such as industrial machinery, equipment used in the construction sector and other equipment used in the transport sector in general. (Buses, automobiles etc.)

Picture 3 shows one of vessels (*UN Akdeniz*) sailing on towards Trieste with vehicles on board.



Picture 3: *UN Akdeniz* sailing towards Trieste with vehicles on board.

Source: UN Ro-Ro Group of Companies, 2004

A total of twelve (12) vessels (with two more to be introduced in the short term) are currently incorporated in the service enabling the transfer of more than 180.000 vehicles (both ways) and an additional free cargo of approximately 100.000 tons per year. The line is operated between three departure terminals located in Turkey (Pendik/Ambarlı/Çeşme) and with one common destination in Italy. (Trieste)

Over a period of a decade (1994-2004), almost **1.250.000** vehicles are carried with our Ro-Ro vessels across the Aegean and Mediterranean Seas in both ways. Capacity utilization ratios on our vessels are quite high, running currently at 86%.

Sub Section 3.1.2 Combined Transport



Once vehicles have disembarked from the vessels at the port of Trieste, the coherency of the Intermodal chain is facilitated via Combined Transport with trains departing regularly from the newly constructed ROLA terminal at Trieste. Type of service provided is called “*Accompanied Combined Transport*”, where drivers are also carried on the trains. Picture 4 below illustrates vehicles boarded onto ROLA trains departing from Trieste.



Picture 4: Vehicles embarked on ROLA trains departing from Trieste Terminal.

Source: RODER, 2005

Previously, such service was affected from Villach (Austria) up to Wels (Austria). Upon a newly signed agreement with *Inter Container Austria* (ICA), a train service is put into operation between Trieste and Salzburg since February

2005. There are 19 trains per week each with a capacity of carrying 20 Complete Units departing from Trieste and Salzburg everyday. The journey takes 9 hours. The vehicles then disembark at Salzburg and continue on to their final destination via Road.

The Combined Transport service from Trieste is implemented with much success and since its inception on February 2005; 9.693 vehicles are carried from Trieste. Table 5 below, illustrates the time schedule of train services from Trieste and from Salzburg. Table 6 refers to the number of vehicles carried with trains on a monthly basis.

Trieste - Salzburg Trains							
Day	No.of Train Services	Capacity/train	Departure hours (From Trieste)			Departure hours (From Salzburg)	
Monday	2	20	13:00	17:00		06:00	09:00
Tuesday	3	20	13:00	17:00	20:00	06:00	09:00 00:00
Wednesday	3	20	13:00	17:00	20:00	06:00	09:00 00:00
Thursday	2	20	13:00	17:00		06:00	09:00
Friday	3	20	13:00	17:00	20:00	06:00	09:00 00:00
Saturday	3	20	13:00	17:00	20:00	06:00	09:00 00:00
Sunday	3	20	13:00	17:00	20:00	06:00	09:00 00:00
TOTAL	19	140					

Table 5: Time Schedule of Accompanied Combined Transport from Trieste and Salzburg.

Source: RODER, 2005

Months	Trieste-Salzburg	Salzburg-Trieste
FEBRUARY	873	652
MARCH	994	950
APRIL	1393	1369
MAY	1395	1176
JUNE	1377	1352
JULY	1270	1279
AUGUST	1015	935
SEPTEMBER	1376	1208
TOTAL	9.693	8.921

Table 6: Number of vehicles using Combined Transport between Trieste and Salzburg since its inception on February 2005

Source: RODER, 2005

Capacity utilization on the train services is over 90 %, proving the success of the operation.

Section 3.2 Modal Shift Actions from Road to Short Sea Shipping and Combined Transport.

Sub Section 3.2.1 Freight Modal Shift Calculations

A sustainable transport system that shifts freight off the roads onto more environmentally friendly transport modes constitutes a common European policy. This vision is reflected on numerous incentive programs such as the Marco Polo Program. This sub section is dedicated to briefly evaluate and calculate approximately the Freight Modal Shift Action from Road to Short Sea Shipping (SSS) and Combined Transport in compliance with Marco Polo principles as a consequence of the Intermodal chain created.

The effected modal shift is measured in terms of ton-kilometers and is based principally on the route the freight would have taken on the road, if not being shifted to the allowed alternative modes of transport.

The results are based on a number of basic and valid assumptions and are indicated in Annex A of this document. The results of our calculations indicate that:

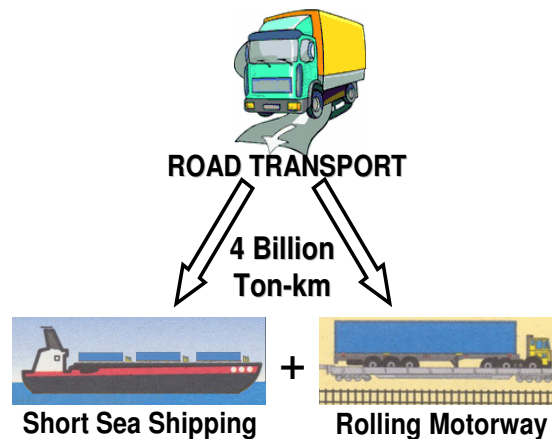
- i) To a common destination from a specific location in Turkey, the total of freight ton - km on the conventional road route is:
3.8 billion ton-km;
- ii) The same freight loaded from the same point and unloaded at the same common destination while using the intermodal line is:
1.8 billion ton-km;
- iii) the amount of freight therefore, shifted from conventional Road Transport to Intermodal Transport is approximately: **2 billion ton-km (one way);**
- iv) On a round trip basis, this constitutes a total shift corresponding to: **4 billion ton-km.**

Sub Section 3.2.2 Calculation of Environmental and Social Benefits And Environmental Efficiency

The environmental and social benefits of the Intermodal line are further studied under Annex B of this document, where it is calculated that:

- i) the Intermodal line creates a monetized environmental and social benefit of approximately: **38.7 million € (one way);**

- ii) that on a round trip scale, the total benefit achieved amount to: **77.4 million €**
- iii) environmental efficiency of the Intermodal line is 0.01 € / ton-km; **Implying that the society is benefiting 1 cent per each ton-km of freight shifted away per kilometre of the old road route.**



Chapter 4 Innovative Aspects

Section 4.1 Integration of Air + Bus Transport for transfer of Drivers

The vessels employed in the Short Sea Shipping Line are non - Ropax type. This implies that the transfer of vehicles over to Trieste is realized in an Un-accompanied type of environment. Therefore, there is a need for transferring the drivers over to Trieste so that they would be able to pick up their vehicles once the vehicles berth. This constraint is tackled through an innovative means where the drivers are flown off to Ljubljana (Slovenia) and then transferred over to Trieste by buses. The drivers are flown off approximately 2 days pursuant to the departure of the vessels. On the return journey from Trieste, however, the drivers are flown back to Istanbul on the same day following the departure of the vessel. This way, the driver is effectively saving a total of approximately 4 days; providing a social added value for their morale where they can spend the time with their families or at their company headquarters. This social aspect of the Intermodal line is significant when one considers the importance of drivers and therefore contributes to the effectiveness of the whole transport chain as defined. Hence, the concept of employment satisfaction is fully implemented. Three Airbus A310 types of aircraft are employed in the transfer of drivers. There is a regular flight from Istanbul and Ljubljana everyday. The flight takes a period of 2 hours. In the year of 2004, around 39.000 drivers are flown on both ways.

Section 4.2 Customization of Vehicles prior to their arrival in Trieste

Once vehicles are boarded onto vessels, the customs documents relevant to vehicles are sent off to Trieste (via airways utilized) two days prior to the arrival of the vessel. Hence, most of the vehicles' customs formalities are completed well before their arrival in Trieste. The vehicle is therefore ready to go once it has disembarked from the vessel. A considerable time is saved through this means serving the purposes of Just in Time concept.

Section 4.3 Web Tracking of Vehicles on board

Through a user friendly web site, it is possible to track down the vehicles on board of the vessel at all times. A facility most important, not only from the transport operators' view, but also for shippers particularly seeking just in time deliveries for their operations.

Section 4.4 A State of the art Ro-Ro Terminal: Pendik

The Pendik Ro-Ro terminal was put into operation in May 2005 and is solely dedicated for the use of Ro-Ro vessels. It is owned and operated by UN Ro-Ro Group of Companies.

Previously, Ro-Ro operations were carried out from a port (Haydarpaşa) situated in the heart of the city, where congestion of traffic was at maximum level.

In order to move the traffic away from the city and provide a much more ambitious and effective service for our clients, a terminal area was purchased in the year of 2002, some 35km. away from the city. The renovation work on site was completed towards the end of April 2005, and since then the Ro-Ro operations are carried from this terminal. The terminal has an open area of 110.000 sq. meters capable of accommodating 1.000 vehicles for export and import trips.

Picture 5 shows vehicles arriving and parking at the site waiting to be boarded onto vessel.



Picture 5: Vehicles at Pendik Ro-Ro Terminal waiting to be boarded onto vessel.

Source: UN Ro-Ro Group of Companies, 2005

The terminal possesses two berths and two Ro-Ro ramps thereby facilitating the boarding of two vessels simultaneously. Offices for Customs, Ministry of Transport personnel and various other official institutions are all provided with computer and networking facilities.

The terminal also has a recreational centre where a cafeteria and a market are operational. All customs formalities and agency works are carried out in an electronic environment. A data entry centre is provided for clients in order to carry out the transit customs formalities. The terminal is secured by a high fence wall and is monitored by video cameras located at different positions working on a 7/24 basis. Our Ro-Ro Companies security team is also on duty every day of the week.



Picture 6: General overview of the Pendik Ro-Ro Terminal

Source: UN Ro-Ro Group of Companies, 2005

Picture 6 above, shows the general overview of the terminal.

The terminal is equipped with a state of the art Gamma Ray device enabling the detection of illicit material carried in trucks as well as its use for prevention of human smuggling. As a secondary security measure, the terminal is further equipped with a very sensitive Radioactive Material Detection device preventing the carriage of dangerous materials within the trucks.

Picture 7 below shows a vehicle going through Gamma Ray inspection.



Picture 7: Vehicle going through Gamma Ray inspection

Source: UN Ro-Ro Group of Companies, 2005

Two weighing bridges are located on each end of the terminal facilitating the weighing of incoming and outgoing vehicles. A warehouse for Customs is provided in case of any truck is to be inspected.

5 Tugging vehicles are employed on the site which are used for the tugging of semi – trailers to and from the vessels.

Total level investment on the terminal reached about 65 million USD including land acquisition.

The new Ro-Ro Terminal shall play a vital role in the enhancement of the Intermodal line created and contribute significantly to the level of services we are providing for our clients.

Section 4.5 Electronic Lodging of Customs Transit Declarations while on route to and from Europe

Although this facility is not implemented fully yet, a considerable amount of work has already been accomplished and integration with the Turkish Customs Automation system and the NCTS of the European Union and EFTA countries will be initiated in the near future.

The project essentially involves and enables a transport operator lodging customs transit declarations together with Customs Guarantees through a user friendly web site by a principal in EU/EFTA and Turkey. A Principal provides a comprehensive type of guarantee to the customs authorities of the countries concerned whereby it is facilitated for the authorized user to lodge his transit declaration. The Transit Declaration is first screened by a Service Centre and upon its acceptance, is then submitted by the respective Principal, to the customs office of departure/entry. Once the declaration is accepted by the customs and provided that the guarantee limit assigned to the Principal is not exceeded, the truck is released from for departure. Below is a brief illustration outlining how a set of declarations are lodged for a transport operation from Germany to Turkey. (Figure: 3) via the Intermodal Line. (Germany – Austria Rolling Motorways – Trieste – Istanbul Ro-Ro - Inland Customs Point in Turkey)

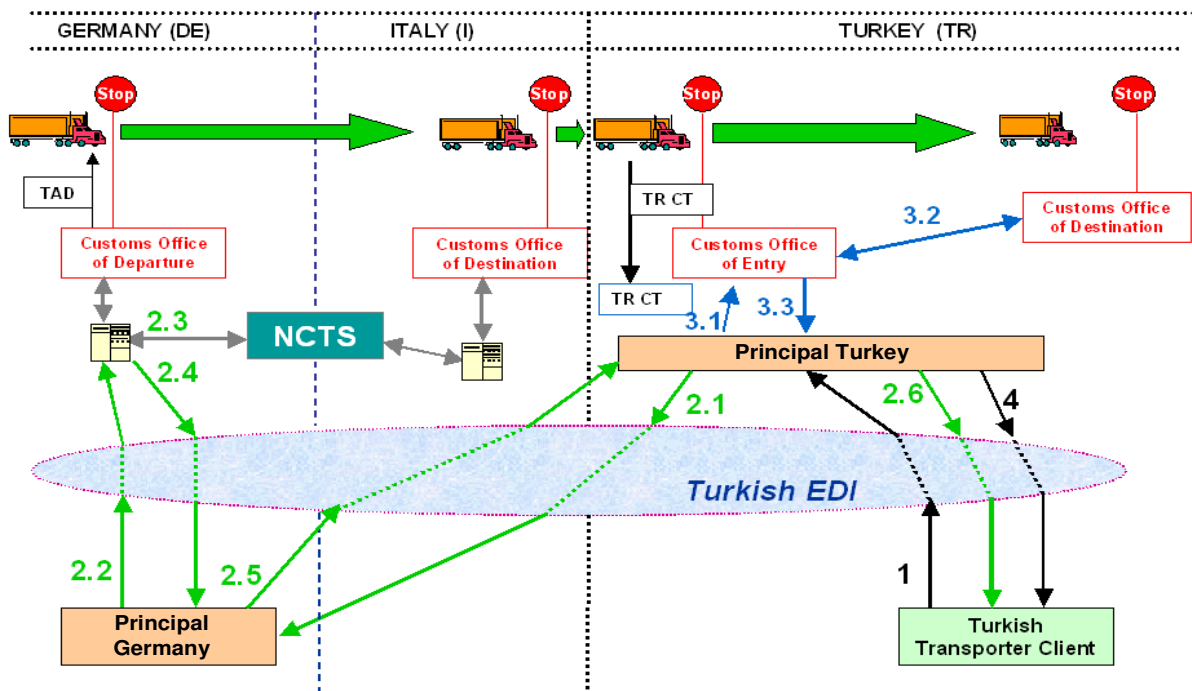


Figure 3: Schematic Diagram illustrating Electronic Lodging of Customs Transit Declarations

Source: RODER, 2005

EU/EFTA Transport Leg:

- 1) *Transport Operator sends Transit Declaration to Service Centre in Turkey over a web environment.*
- 2.1) *Service Centre in Turkey, verifies correctness of Declaration and notifies Principal in Germany.*
- 2.2) *Principal Germany checks and submits Declaration to German Customs; German Customs accepts (or rejects) Declaration and provides transport operator with TAD Transport Accompanying Document (TAD)*
- 2.3) *German Customs notify Italian Customs via NCTS. Italian Customs checks truck on arrival and if OK, gives a driver an additional Transit Arrival Document (TC11)*
- 2.4) *German Customs notify Principal in Germany for a Customs Transit (CT) termination; Guarantee is released.*
- 2.5) *Principal in Germany notifies Service Centre in Turkey of termination of CT.*
- 2.6) *Service Centre in Turkey, notifies Transport Operator (client) of termination of CT*

Turkish Transport Leg:

- 3.1) *Principal Turkey verifies correctness of TR- CT and notifies Turkish Customs of departure/entry*
- 3.2) *Turkish Customs notifies Customs Office of Destination/exit; Turkish Customs checks vehicle on arrival and if OK, notifies Principal in Turkey.*
- 3.3) *Turkish Customs notify Principal in Turkey of TR- CT termination, Guarantee is released.*
- 4) *Service Centre in Turkey informs Client.*

Chapter 5: Key Elements in Market Success

Section 5.1 Just in Time Operations

There are currently 400 Transport Operators utilizing the Intermodal line on a regular basis. The service has proved to be extremely fast when compared to the road route. A vehicle leaving Istanbul on a Friday night for example, is in a position to unload in Central Europe by Tuesday noon time.

The same journey on the road route will take a period 5 days. That is almost a saving of 1.5 days per one way. During winter time however, the road route will take even longer and can be as high as 6-7 days. From this perspective, the efficiency of the transport operator utilizing the intermodal line can become as high as 50% more than his counterpart operating on the road.

Reliable and frequent schedules are an indispensable part of the Just in Time concept. With a demand driven sector, time has become the most important factor. In order to enable the quick return of the vehicle, an **interoperable freight management** system is created. Any vehicle traveling back to Turkey from Trieste, may choose to travel to any of the destination points (Pendik/Ambarlı/Çeşme) depending on vessel availability. That is to say, for example, a vehicle which has departed from Pendik can return to Ambarlı or Çeşme port. The system will allow for acknowledging the freight from any point in departure or arrival.

Section 5.2 Avoidance of difficulties encountered in Border Crossings over the Road route

A transport vehicle traveling to Europe shall need to cross 7 borders before entering EU territory. Customs formalities are therefore repeated 7 times one after the other resulting in a considerable time loss. Coupled with these set of constraints are the varying customs applications of each country contributing negatively to the bureaucratic procedures. On the Intermodal line created, the vehicle is subject to one border crossing (Trieste – Italy) before entering EU territory thereby avoiding all the complexities encountered on the road route.

Section 5.3 Savings realized over Road User Charges/Taxation other Charges

The road route incorporates a number of road user charges and taxes while the vehicle is transiting over the countries en route. A vehicle transiting Bulgaria – Serbia and Montenegro – Croatia – Slovenia – Austria – Germany for example, is subject to payment of approximately 572 € (one way) for various road user charges/taxes and other expenses such as parking, disinfection fees, bridge crossings etc. Not only this is expensive, but it also employs the cumbersome method of supplying the driver with large sums of cash and therefore sometimes creates a real cash flow problem for transport companies particularly if they are involved in large projects. On the Intermodal line created however, these problems are overcome simply because transit across such countries is no longer a question.

Section 5.4 Other Operational savings and advantages for Users

Sub Section 5.4.1 Savings on Fuel, Depreciation and Maintenance Costs of vehicles

A truck traveling on the road route makes approximately 5.000 km. on a round trip basis and consumes 1.150 € worth of fuel. The same journey on the Intermodal line (SSS + CT) will take 1.550 km. and cost the transport company, a mere 400 € again on a round trip scale. But further real savings are realized when one takes into account the depreciation and maintenance costs. According to a study we have conducted over the recent months, the cost of maintenance for a truck traveling on the road route will sum to 363 €, per round trip, where it will be 60 € had journey been effected on the Intermodal line. Significant savings are also realized on the side of depreciation costs. The cost of depreciation on a round trip scale for a truck traveling on the road route is estimated to be 213 € where it is 168 € on the Intermodal line.

Sub Section 5.4.2 Savings on Capital Investment for vehicles

One other advantage of the Intermodal line and a key element in its success as a market led project is the provision of savings on capital investments for vehicles. As stated earlier; transport companies are currently investing on fewer number of tractor units as compared to the past as a consequence of the facility provided for the transfer of semi – trailer units on our vessels. On the road route however, investment is required on both the tractor and the semi-trailer unit. According to our studies, a transport company indulging in semi-trailer activity now employs tractor units as much as half the number of semi-trailers. This aspect of the Intermodal line on its own constitutes a huge saving in capital investment for tractor units thus enabling the transport companies to invest in other areas such as logistics.

Sub Section 5.4.3 Safety and Security factors

On the Intermodal route created, during the whole part of the journey, a safe and secure platform is provided for goods and vehicles. The vehicles enter a secure environment from the moment of their entry to the Ro-Ro terminal up to the point of their destination point. The risk of theft, robbery etc. is practically non existent. The safety record of our Ro-Ro Terminals and Vessels are impeccable and all governed by the latest ISPS rules and marine regulations.

Sub Section 5.4.4 Savings over Insurance Costs

One by product of the Intermodal line is the savings it creates for vehicles over the insurance costs. As a result of the safe and secure environment provided, such is reflected on the insurance premiums. As the truck is encountering less kilometers, the risk of an accident is minimized as well as other risks such as theft and robbery. As a consequence, such positive developments are reflected over various insurance costs such as Third Party Liability, CMR and Kasko. A saving up to 20-25% can be achieved in insurance costs on the Intermodal line.

Sub Section 5.4.5 Advantages and cost savings over Visas for Drivers

A driver on the road route shall need to possess the visas of at least 3 countries on his passport. The acquisition of all these visas is not only a time consuming process, but can become a significant cost element as well. For a driver using the Intermodal Line however, the acquisition of one visa (Schengen) is adequate. This constitutes a key issue when one considers the time lost while acquiring such visas.

Sub Section 5.4.6 Opportunity to use alternative Transit Customs Regimes

The Intermodal line between Turkey and Europe enables transport operators to utilize alternative transit customs regimes. This is a facility, not yet available on the road route. The transport operator can use the TIR regime, from one end and the Common Transit Regime (or the NCTS) as an alternative on the other. In the latter case, a T1 declaration is opened at Trieste and is terminated at the customs point of destination. The provision of being able to utilize two different customs regimes becomes an important tool particularly in cases where the cargo carried is partial. (Groupage Cargo)

Chapter 6 Conclusions

The Intermodal line created between Turkey and Europe has become the most demanded form of transport for goods destined to Europe. Founded almost a decade ago, it plays a dominant role in the country's economic integration with Europe. While serving the needs of the international transport community, it provides a sustainable solution in transport growth particularly when assessed with the existing problems in road haulage. Moreover, it provides a competitive edge for the sector in general, while making more use of different transport modes at the same time. Last, but not certainly not least, it attracts the sympathy of the public in general and gains the huge support of policy makers.

As people become more environment conscious, they demand a transport chain where marginal external effects are minimal. In this context, the Intermodal line created, does just that and attracts the attention of the whole world as a success story.

Annex A

Freight Modal Shift Calculations:

Assumptions:

1) In order to perform a calculation in freight modal shift, we must first of all determine the total distance that a truck shall travel from a specific location in Turkey in a specific period of time to a common destination in Europe while exiting from a common border crossing point in Turkey.

For this purpose, we will assume the period of year 2004 where, **91.815** vehicles have departed from Turkey using our Ro-Ro vessels.

Such vehicles would have followed the Road route to Europe had there not been an Intermodal service available.

2) We will further assume that loadings of the vehicles are realized in an industrial zone like Western Anatolia (Bursa - where most of the exports are realized from) and that goods are unloaded again at an industrial zone like Frankfurt. (Germany)

The 91.815 vehicles would have traveled to Europe by Road had there not been an Intermodal service available, following the assumed route:

Turkey (Bursa) – Bulgaria – Serbia and Montenegro – Croatia – Slovenia – Austria – Germany (Frankfurt)

Below is the total kilometers (as per the countries en route) a vehicle shall need to travel on Road:

Turkey: (Bursa – Border Crossing Point)	508 km.
Bulgaria:	350 km.
Serbia and Montenegro:	437 km.
Croatia:	351 km.
Slovenia:	56 km.
Austria:	315 km.
Germany (Frankfurt):	<u>455 km.</u>
TOTAL BY ROAD:	2.472 km. (One way)

3) On the Intermodal line created, the following route would be taken:

Turkey (Bursa) – Pendik Ro-Ro Terminal – Trieste Ro-Ro Terminal – Villach ROLA Terminal – Wels ROLA Terminal^(*) - Frankfurt incorporating the following distances to be covered:

Turkey (Bursa – Pendik Ro-Ro Terminal):	223 km.	(by Road)
Pendik – Trieste Ro-Ro Terminal:	2.128) km.	(by SSS)
Trieste Ro-Ro Ter. – Villach Terminal ^(*)	197 km.	(by Road)
Villach ROLA Terminal – Wels Rola Terminal:	(295) km.	(by CT)
Wels ROLA Terminal – Frankfurt:	<u>526 km.</u>	(by Road)
TOTAL BY ROAD:	946 km.	(One way)

4) A thorough study had been conducted on the weight of the goods carried by a vehicle in our vessels. It has been calculated that on average a vehicle carrying goods to Europe is loaded with **16.74 tons** of goods

Definitions:

$F_{(old)}$ = the Freight transported on the old route (road) in ton-km.

$L_{(old)}$ = the road route length in km.

$N_{(old)}$ = no. of trucks traveling along the road route; $L_{(old)}$ (91.815 vehicles)

W = the weight of the freight transported in tons/vehicle(16.74 tons)

Then; $F_{(old)} = L_{(old)} * W * N_{(old)}$

Hence; $F_{(old)} = 2.472 \text{ km} * 16.74 * 91.815 = 3.799.422.223 \text{ ton-km}$

i.e. approximately **3.8 billion ton-km** of goods were transported on the road route to Europe. (which, for purposes of simplicity, is assumed to be carried on a common point, such as Frankfurt. This seems to be a valid assumption, since some vehicles are covering longer distances to countries like UK, Spain, Portugal and Denmark etc. where others are traveling with shorter distances to countries like Italy, Slovenia, and Austria etc. So on balance we could assume a mid point like Frankfurt)

(*) : In the year 2004, vehicles effecting Combined Transport used the Villach-Wels ROLA line (Rolling Motorways), since the Trieste – Salzburg

line was not yet incepted. During this year, 19.619 vehicles have used the Combined Transport facility via Villach.

In this context;

72.196 vehicles have utilized the SSS + Road Intermodal environment covering a total **distance on road** by 1.241 km. and;

19.619 (91.815 – 72.196) vehicles have utilized the SSS + CT + Road Intermodal environment covering a total **distance on road** by 946km.

If;

$F_{(new\ 1)}$ = the freight transported on the new route while utilizing SSS+CT +Road (ton-km)

$F_{(new\ 2)}$ = the freight transported on new route while utilizing SSS + Road (ton-km)

$L_{(new\ 1)}$ = Road route length using SSS + CT intermodality (946 km)

$L_{(new\ 2)}$ = Road route length using SSS intermodality (1.241 km)

$N_{(new1)}$ = No.of vehicles using SSS + CT + Road (19.619)

$N_{(new2)}$ = No.of vehicles using SSS + Road (72.196)

ΔF = Modal Shift Action in ton-km

then; $\Delta F = F_{(old)} - (F_{(new\ 1)} + F_{(new\ 2)})$

where;

$F_{(new\ 1)} = L_{(new\ 1)} * W * N_{(new1)} = 946 * 16.74 * 19.619 = 356.525.507$ ton-km

$F_{(new\ 2)} = L_{(new\ 2)} * W * N_{(new2)} = 1.241 * 16.74 * 72.196 = 1.453.986.507$ ton-km

Hence; $\Delta F = 3.799.422.223 - (1.453.986.013 + 356.525.507)$

= 1.988.910.703 ton-km.

That is to say, in the year of 2004 only, approximately **2 billion ton-km** of goods are shifted from Road to an Intermodal environment.

Considering that, almost all trucks returning from Europe to Turkey are laden; this makes a total of **4 billion ton- km** of goods shifted from Road Transport to Intermodal Transport.

ANNEX B

Calculation of Environmental and Social Benefits and Environmental Efficiency

This Annex contains the methodology for calculation of the Environmental Benefits taking into account of the “External Costs” such as Pollutants, Climate Costs, Noise, Accidents, Infrastructure and Cost of Congestion.

Specific External Cost Factors (e); (in Euro/ton-km) are extracted from Annex II of the explanatory memorandum of the original proposal for the Marco Polo program. ((COM (2002) final of 04.02.2002))

<u>Mode of Transport</u>	<u>Specific External Cost; (e) (Euro/ton-km)</u>
Road	0.035
Short Sea Shipping	0.009
Rail	0.015
Inland waterway	0.010

Definitions:

B = Monetized Environmental benefit in Euro (€)

$C_{(new)}$ = Sum of External Cost of the new “modally shifted” route in Euros;
(€)

$C_{(old)}$ = External Cost of the old Road route in Euros; (€)

$e_{(new)}$ = Specific Ext. Cost of the alternative mode of transport (€/ton-km)

$e_{(old)}$ = Specific Ext. Cost of Road Transport (€/ton-km)

$R_{(T)}$ = Environmental Efficiency of the Intermodal Line (€/ton-km)

then;

$$C_{(new)} = \sum(F_{(new)} * e_{(new)})$$

$$C_{(old)} = F_{(old)} * e_{(old)}$$

and;

$$B = C_{(old)} - C_{(new)}$$

$$R_{(T)} = B / F_{(old)}$$

where; $F_{(new)}$ = Specific freight shifts in ton-km taking into account the mode of transport.

Therefore;

$$C_{(old)} = 3.799.422.223 \text{ ton-km} * 0.035 \text{ €/ton-km} = 132.979.778 \text{ €}$$

$$\begin{aligned} C_{(new)} &= (91.815 \text{ veh.} * 223 \text{ km.} * 16.74 \text{ ton/veh.} * 0.035) + \\ &\quad (91.815 \text{ veh.} * 2.128 \text{ km.} * 16.74 \text{ ton/veh.} * 0.009) + \\ &\quad (91.815 \text{ veh.} * 197 \text{ km.} * 16.74 \text{ ton/veh.} * 0.035) + \\ &\quad (72.196 \text{ veh.} * 295 \text{ km.} * 16.74 \text{ ton/veh.} * 0.035) + \\ &\quad (19.619 \text{ veh.} * 295 \text{ km.} * 16.74 \text{ ton/veh.} * 0.015) + \\ &\quad (91.815 \text{ veh.} * 526 \text{ km.} * 16.74 \text{ ton/veh.} * 0.035) \\ &= 94.257.471 \text{ €} \end{aligned}$$

hence;

$$B = 132.979.778 - 94.257.471$$

$$= \mathbf{38.722.307 \text{ €}}$$

Therefore, the environmental and social benefit of the intermodal line created, in monetary terms sum approximately 38.7 million Euros.

In this sense, **on a round trip basis, a total benefit of 77.4 million Euros is created environmentally and socially.**

The **Environmental Efficiency** of the Intermodal line on the other hand is;

$$R_{(T)} = 38.722.307 / 3.799.422.223 = \mathbf{0.01 \text{ € / ton-km}}$$

Implying that the society is benefiting 1 cent per each ton-km of freight shifted away per kilometre of the old road route.