



# RECORDIT

## Overview of objectives and key findings

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## Plan

- **Objectives**
- **Approach**
- **Comparing the competitiveness of intermodal and all-road solutions: some key figures**
- **Simulating the implementation of policy options: some key results**



## Plan

- **Objectives**
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# Objectives

- Investigate the current market conditions (costs and prices) of intermodal door-to-door freight transport in Europe
- Develop a methodology for the calculation of real costs (internal + external) of intermodal transport
- Calculate real costs for three door-to-door European corridors
- Identify and analyse current imbalances (prices Vs Costs, intermodal Vs all-road)
- Identify and investigate policy options to increase the competitiveness of door-to-door intermodal transport (reduction of costs, correction of distortions)



→ **100% funding from the EC – FP5**

→ **Two years**

→ **The project team:**

- |                                |  |
|--------------------------------|--|
| ★ <b>ISIS (It)</b>             | <b>Coordination + development of DSS</b> |
| ★ <b>ZEW (De)</b>              | <b>Methodological framework</b>          |
| ★ <b>Gruppo CLAS (It)</b>      | <b>Internal costs</b>                    |
| ★ <b>IER Stuttgart (De)</b>    | <b>External costs</b>                    |
| ★ <b>TNO (Ne)</b>              | <b>Taxes and charges</b>                 |
| ★ <b>TETRAPLAN (Dk)</b>        | <b>Current imbalances</b>                |
| ★ <b>ENPC-LATTS (Fr)</b>       | <b>Cost reduction options</b>            |
| ★ <b>Cranfield U. (Uk)</b>     | <b>Policy analysis</b>                   |
| ★ <b>NTUA (Gr)</b>             | <b>Dissemination</b>                     |
| ★ <b>3 CEEC subcontractors</b> |  |

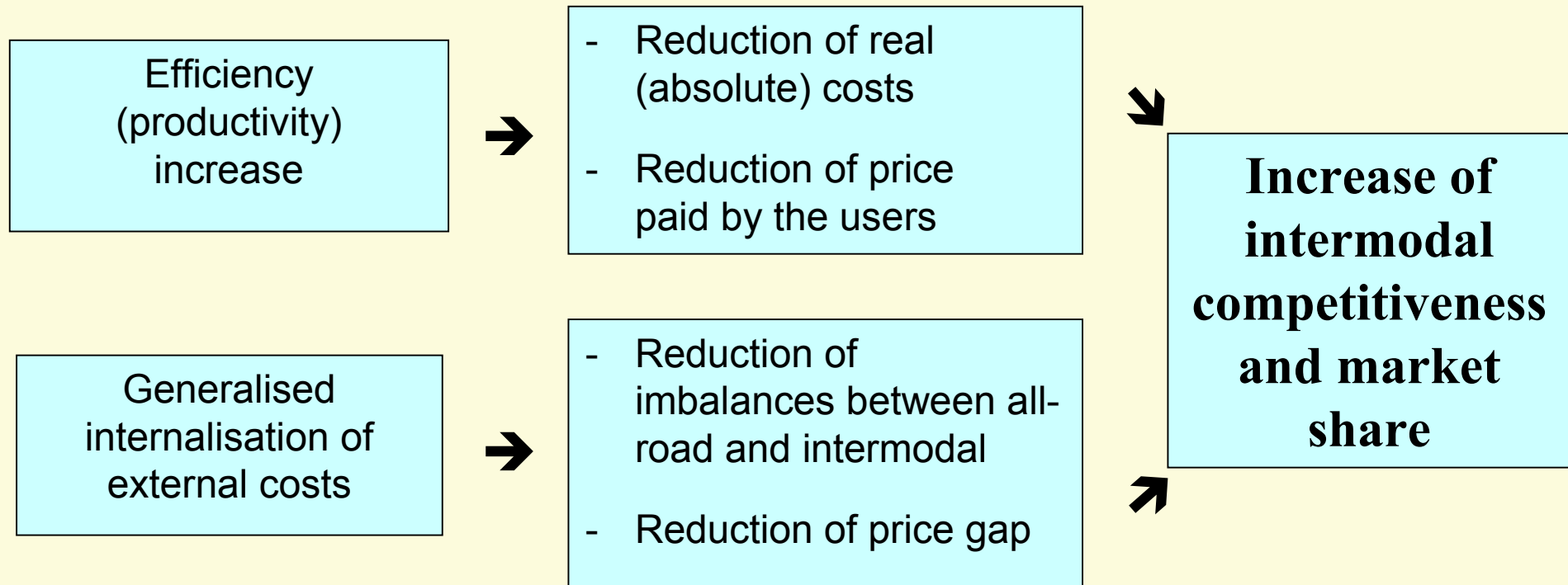


# Policy relevance: the CTP

- ★ **Shifting the balance between modes (Part One)**
  - Improving quality in the road sector (I.A)
  - Revitalising the railways (I.B)
  - Linking up the modes of transport (II)
- ★ **Eliminating bottlenecks (Part Two)**
  - Towards multimodal corridors giving priority to freight (I.A)
- ★ **Placing users at the heart of transport policy (Part Three)**
  - Towards gradual charging for the use of infrastructure (II.A)



# Pricing relevance





## Identifying cost drivers: the main categories

- ↙ **Technological performance of vehicles, equipment etc.**
  - Energy consumption
  - speed of operation
  - labour intensity
  - etc.
- ↙ **Organisational performance of systems**
  - number of transhipments
  - reduction of waiting time
  - etc.
- ↙ **Effectiveness and efficiency of charging and taxation systems**
  - cost coverage of charges
  - non distortive taxes



- Objectives
- **Approach**
- Comparing the competitiveness of intermodal and all-road solutions: some key figures
- Simulating the implementation of policy options: some key results



## The real costs of intermodal transport

- ↙ The need for a comprehensive accounting framework. Euro/LU



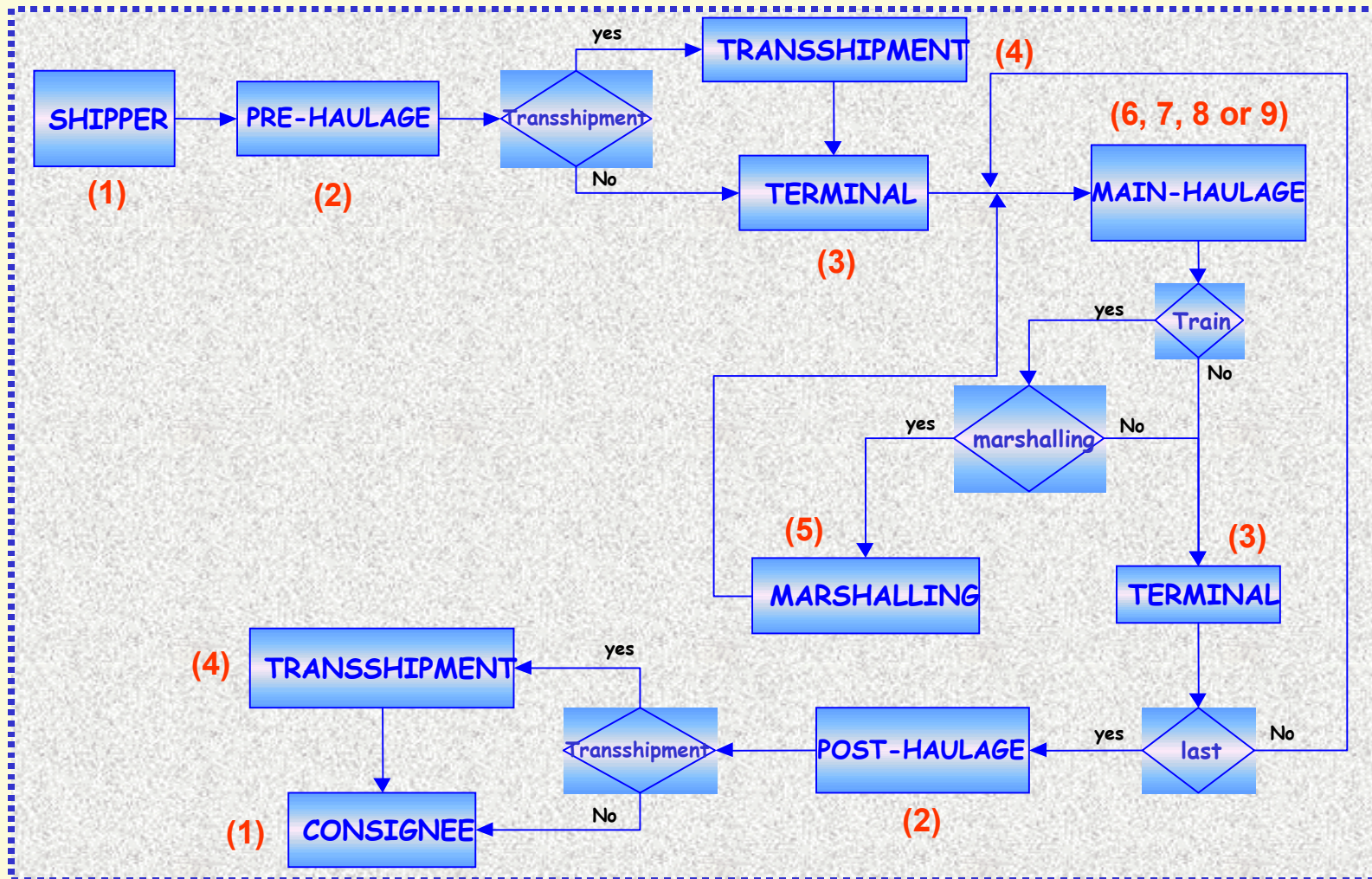
## The real costs of intermodal transport

- ↙ The need for a comprehensive accounting framework. Euro/LU
- ↙ The 9 “building blocks” of intermodal transport



## Building blocks

1. Shipper/consignee
2. Pre/post haulage
3. Terminal
4. Transshipment point
5. Marshalling yard
6. Main haulage by road
7. Main haulage by train
8. Main haulage by sea
9. Main haulage by inland waterways





## The real costs of intermodal transport

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- ↙ A bottom-up approach (when feasible)



## The real costs of intermodal transport

- ↙ The need for a comprehensive accounting framework. Euro/LU
- ↙ The 9 “building blocks” of intermodal transport
- ↙ A bottom-up approach (when feasible)
- ↙ Internal (resource) costs



## Internal costs

- **Staff**
- **Fixed assets and maintenance**
- **Energy and other consumption**
- **Stock turn**
- **Organisation costs**
- **Insurance, taxes and charges**



## The real costs of intermodal transport

- ↙ The need for a comprehensive accounting framework. Euro/LU
- ↙ The 9 “building blocks” of intermodal transport
- ↙ A bottom-up approach (when feasible)
- ↙ Internal (resource) costs
- ↙ External costs



### Internal costs

- Staff
- Fixed assets and maintenance
- Energy and other consumption
- Stock turn
- Organisation costs
- Insurance, taxes and charges

+

### External costs

- Accidents
- Air pollution
- Noise
- Climate change
- Up- and down-stream
- Congestion

+

Wear and tear



## Internal costs

- ↙ Corridor-specific, bottom-up costs for each block
- ↙ Direct measures/observations
- ↙ Published case studies
- ↙ Company accounts
- ↙ Expert estimates



## External costs

- ↙ **Impact Pathway Approach (ExternE methodology)**
- ↙ **EU-wide reduction target for Greenhouse gases (climate change)**
- ↙ **LCA (Life Cycle Analysis) includes vehicles, fuels and Loading Units (no infrastructure provision)**
- ↙ **Segments of variable length**
- ↙ **Reference (representative) technology (vehicle, device, etc.)**
- ↙ **Impacts (on health, crops, building materials, climate change) expressed in Euro/LU**



## The RECORDIT corridors

- the *freight freeway* between Patras - Brindisi - Verona - Munich - Hamburg and Gothenburg



## Patras - Gothenburg



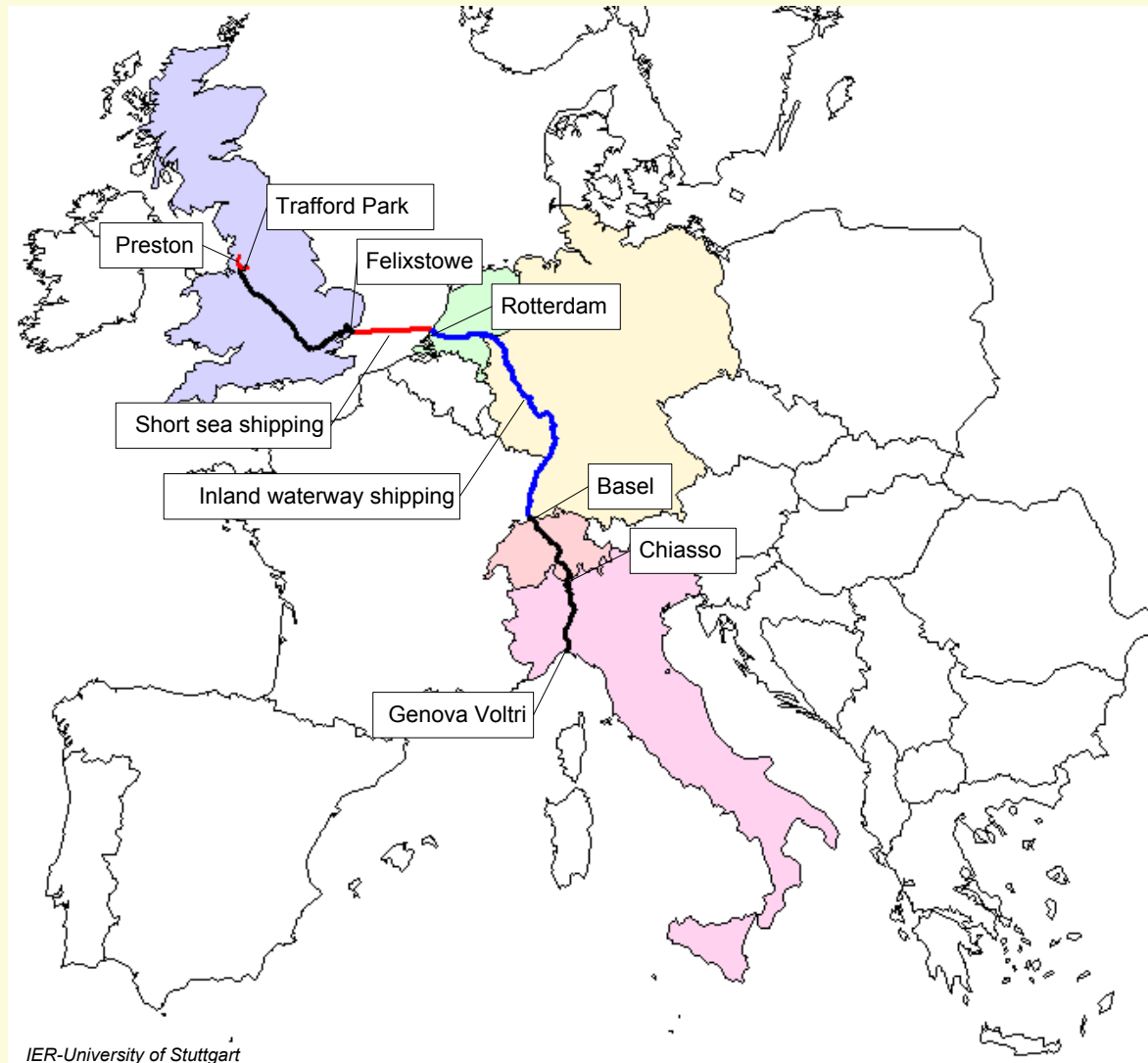


## The RECORDIT corridors

- **the *freight freeway* between: Patras - Brindisi - Verona - Munich - Hamburg and Gothenburg**
- **the *tri-modal transport chain* between: Genova - Basel - Rotterdam and Manchester**



## Genova - Manchester



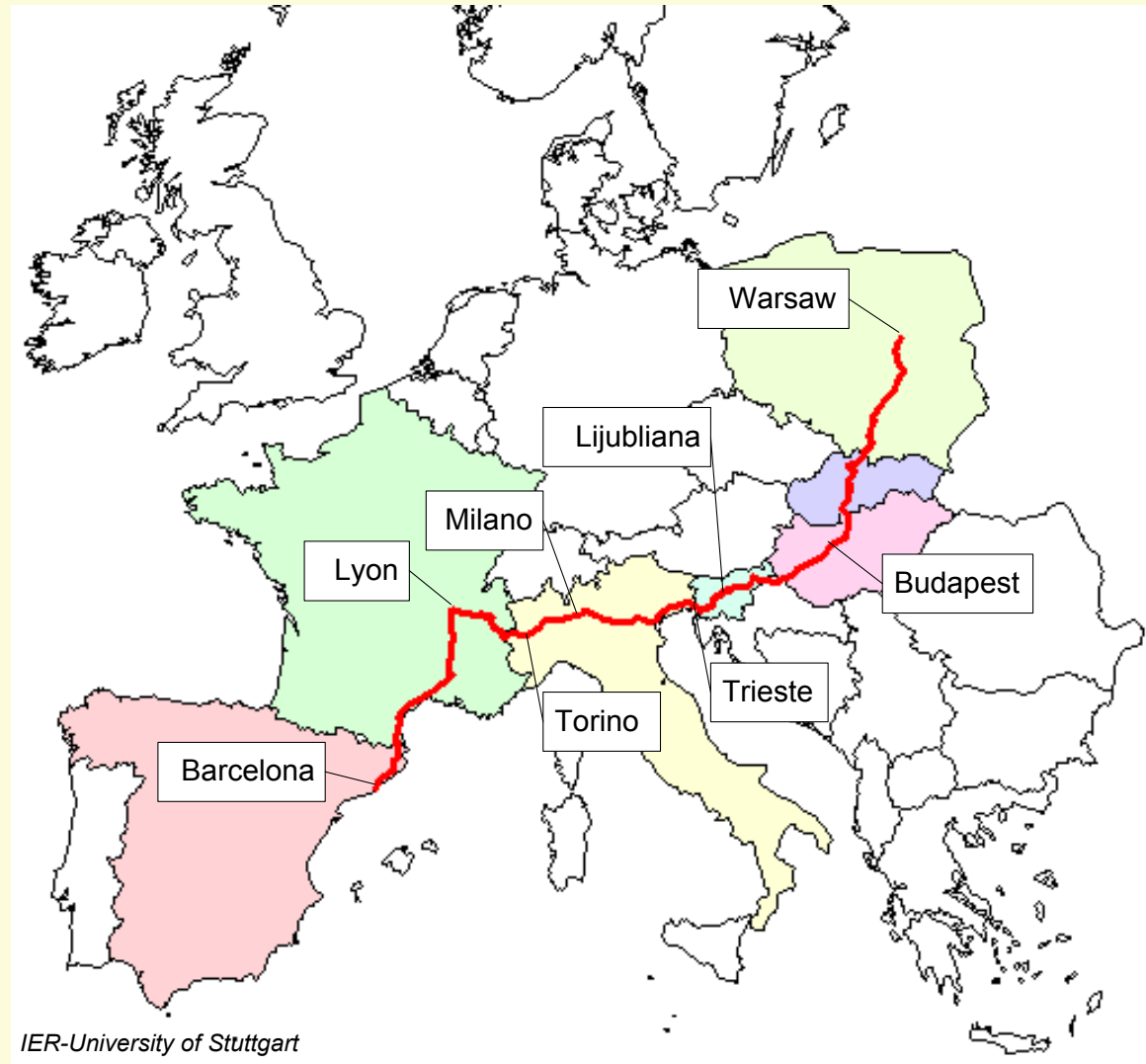


## The RECORDIT corridors

- the *freight freeway* between **Patras - Brindisi - Verona** - **Munich - Hamburg and Gothenburg**
- the *tri-modal transport chain* on the corridor between **Genova - Basel - Rotterdam and Manchester**
- the *door-to-door intermodal transport chain* along the corridor **Barcelona - Lyon - Torino - Verona - Budapest and Warsaw**



## Barcelona - Warsaw





## Representativity of the 3 corridors

- The three RECORDIT corridors are reasonably representative of the European market, although:
  - ★ in their full configuration, they are not directly market-relevant
  - ★ variability has been found very high (therefore, no “average values” seem reasonable)
  
- Moreover: uncertainties affecting cost values can be high, due to:
  - ★ the difficulty in obtaining quality bottom-up data
  - ★ the difficulty in establishing a common set of assumptions across Countries and corridors (e.g. truck refuelling location)
  - ★ the uncertainties associated to the valuation methodologies



# Representativity of the 3 corridors

→ **However:**

- ★ segments within each corridor are market-realistic
- ★ the RECORDIT database features data at all possible levels of disaggregation
- ★ the RECORDIT DSS allows for a flexible and multi purpose use of the cost data:
  - performing sensitivity analyses to partially compensate uncertainties
  - creating and analysing “new” corridors (assembling blocks)
  - simulating (policy driven) changes on individual cost items, cost categories etc.

→ **Therefore: the data sample from the 3 corridors can be used for transferability and generalisation purposes**



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## Comparing the competitiveness of all-road Vs intermodal transport: time and costs

	Intermodal corridors (hours)	All road solutions (hours)	Time ratio	Intermodal cost (Including taxes and charges) (Euro/LU)	All Road cost (Including taxes and charges) (EURO/LU)	Cost ratio
Patras-Gothenburg	144	85,1	1,69	4142,9	3687,8	1,12
Genova-Manchester	223,5	52	4,30	1422,2	1262,9	1,13
Barcelona-Warsaw	158,8	88,1	1,80	3345,6	2823,6	1,18



## Comparing the competitiveness of all-road Vs intermodal transport: external costs

Euro/LU

	Intermodal	All-road	Ratio
Genova - Manchester	153	276	0.55
Patras - Gothenburg	872	1264	0.69
Barcelona - Warsaw	650	1012	0.54



## External costs: variability along segments

	Barcelona-Warsaw Intermodal Corridor		
	km	EURO/LU	EURO / LU km
Barcelona- Port Bou (ES)	215	160,7	0,75
Port Bou- Modane (FR)	793	84,7	0,11
Modane- Villa Opicina (IT)	834	118,0	0,14
Villa Opicina- Sredisce (SI)	305	50,1	0,16
Sredisce- Kotoriba (HR)	42	5,4	0,13
Murakeresztur- Hidasnemeti	520	83,4	0,16
Hidasnemeti- Muszyna (SK)	116	20,1	0,17
Muszyna- Warsaw (PL)	395	127,8	0,32
<b>Total</b>	<b>3220</b>	<b>650,3</b>	<b>0,20</b>



# Comparing the competitiveness of all-road Vs intermodal transport: overall

	INTERMODAL SOLUTION					
	Internal / Direct Costs	Taxes, charges & subsidies	External costs	Total costs / LU	Length	Total costs / LU.km
	EURO / LU	EURO / LU	EURO / LU	EURO / LU	Km	EURO / LU.km
<b>Genoa-Manchester</b>	1232	190	153	1575	2134,0	0,74
<b>Barcelona-Warsaw</b>	3092	254	650	3996	3220,0	1,24
<b>Patras-Gothenburg</b>	3574	569	872	5015	4128,0	1,21
	ALL ROAD SOLUTION					
	Internal / Direct Costs	Taxes, charges & subsidies	External costs	Total costs / LU	Length	Total costs / LU.km
	EURO / LU	EURO / LU	EURO / LU	EURO / LU	Km	EURO / LU.km
<b>Genoa-Manchester</b>	1262,9	294	277	1833	2134,0	0,86
<b>Barcelona-Warsaw</b>	2823,6	588	1012	4423	3220,0	1,37
<b>Patras-Gothenburg</b>	3687,8	1264	872	5824	4128,0	1,41



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## Policy analysis

Reduction of rail electricity consumption by 50% (CTP - 2001)

<b>Barcelona - Warsaw</b>			
	<b>Before</b>	<b>After</b>	<b>Gain</b>
<b>Total costs (I+E)</b>	<b>3916</b>	<b>3389</b>	<b>13,40%</b>
<b>Electricity costs</b>	<b>183</b>	<b>98</b>	<b>46,60%</b>

<b>Patras - Gothenburg</b>			
	<b>Before</b>	<b>After</b>	<b>Gain</b>
<b>Total costs (I+E)</b>	<b>5218</b>	<b>4280</b>	<b>17,90%</b>
<b>Electricity costs</b>	<b>439</b>	<b>279</b>	<b>36,40%</b>



# Policy analysis

## Achieving the interoperability of the rail networks (CTP - 2001)

Barcelona - Warsaw			
	Before	After	Gain
Total costs (I+E)	3916	3740	4,10%

Patras - Gothenburg			
	Before	After	Gain
Total costs (I+E)	5218	5130	1,70%

Genova - Manchester			
	Before	After	Gain
Total costs (I+E)	1628	1622	0,20%



## Policy analysis

**Rationalising Pre- and Post-haulage  
(Load factor increase from 60% to 95%)**

### **Cost reduction achievable on Patras - Gothenburg**

	<b>Intermodal</b>	<b>All-road</b>
<b>Internal costs</b>	<b>4.5%</b>	<b>3%</b>
<b>External costs</b>	<b>13%</b>	<b>9.2%</b>
<b>Total costs</b>	<b>5.9%</b>	<b>3.9%</b>



## Preliminary conclusions

- ⇒ **Intermodal transport is currently slower than all-road AND its costs (internal + taxes and charges) are higher**
- ⇒ **External costs of intermodal transport are significantly lower than for all-road**
- ⇒ **Current taxes and charges do not seem to favour all-road transport**
- ⇒ **Internalisation of external costs alone is not sufficient to promote intermodality**
- ⇒ **Technological and organisational improvements can significantly contribute to reduce both internal AND external costs of intermodality**
- ⇒ **Individual measures can yield positive results, but integrated packages are needed to achieve radical changes**