

**BESTUFS workshop**  
**Genova - 8 November 2001**

**RECORDIT**  
**REAL COST REDUCTION OF**  
**DOOR-TO-DOOR INTERMODAL TRANSPORT**

([www.recordit.org](http://www.recordit.org))

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ISIS (IT) - Gruppo CLAS (IT) - IER (DE)  
ZEW (DE) - CRANFIELD U. (UK) - TNO (NE)  
TETRAPLAN (DK) - NTUA (GR) - ENPC/LATTS (FR)

**Funded by EU 5th Framework RTD - Growth Programme**

- Main project features
- Intermodal cost structure
- How to calculate costs
- The RECORDIT corridors
- Sample results (external costs)

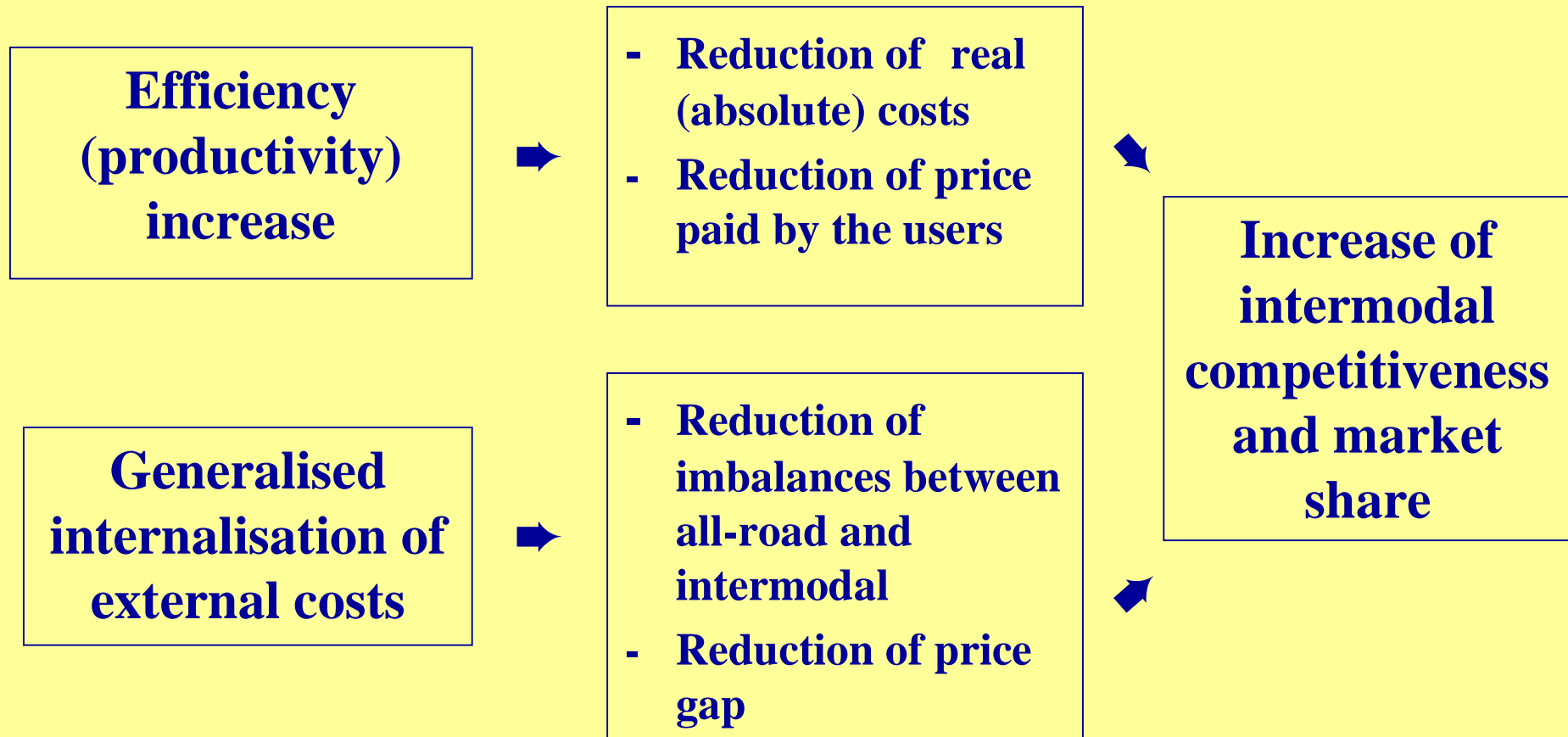
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**The ultimate objective of RECORDIT is “*to increase the efficiency and competitiveness of intermodal transport in Europe*”**

### **Detailed objectives and workflow:**

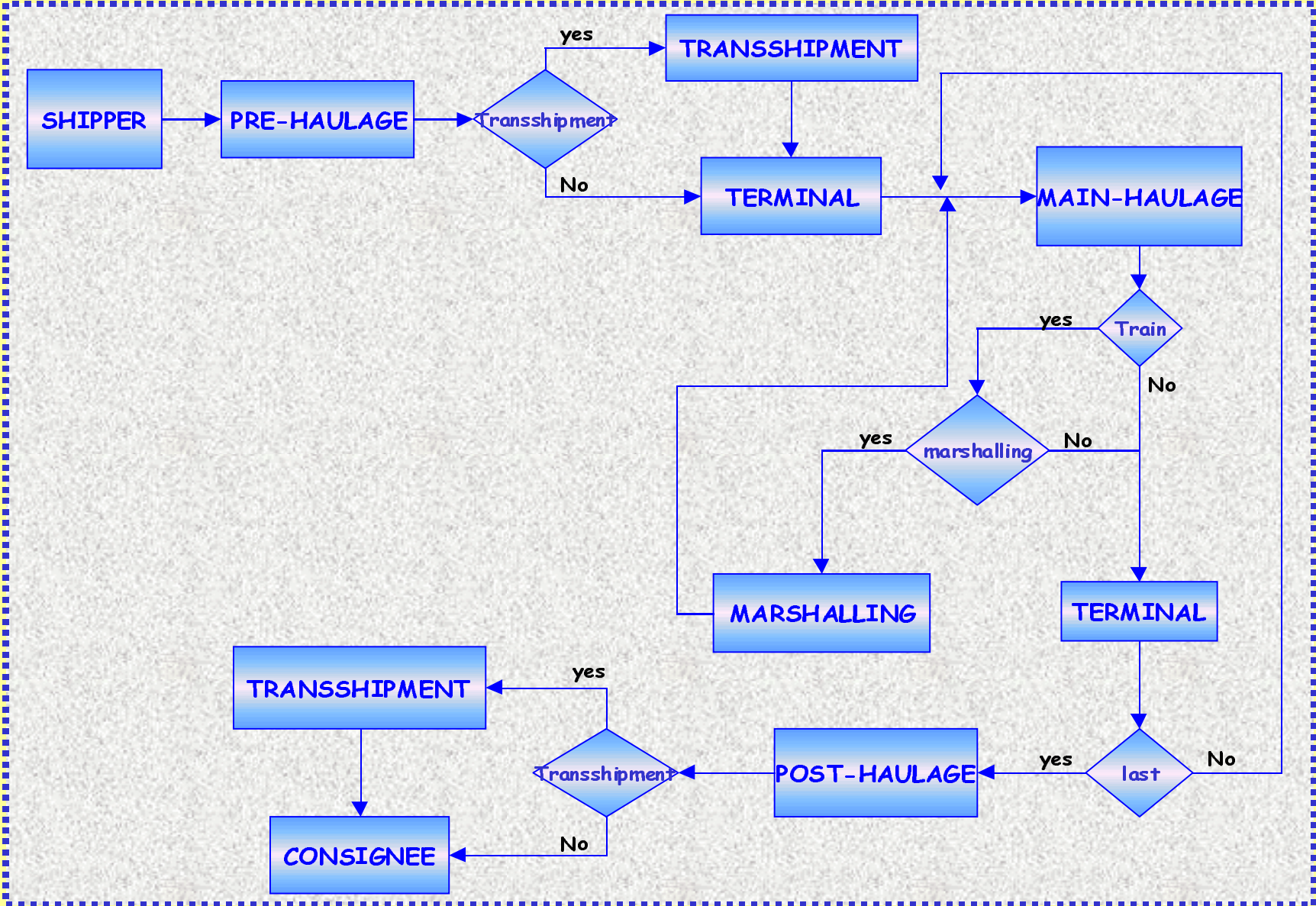
- **To devise a methodology for the calculation of real costs (internal, external) of door-to-door intermodal transport**
- **To calculate costs for three European corridors**
- **To compare real costs with prices actually paid (charges and taxes)**
- **To compare intermodal Vs all-road costs**
- **To assess current imbalances and market distortions**
- **To identify policies (public) and actions (business) to reduce intermodal costs and correct current distortions**

# Pricing relevance



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# Intermodal chains





<i>Energy, other consumption materials / telephone, telecommunication and radio</i>	Shipper / Consignee	Pre and post haulage	Transship Point	Terminal	Marshalling	Haulage Road	Haulage Rail	Haulage waterway	Haulage Maritime
<b>Fuel, diesel</b>		X			X	X	X	X	X
<b>Electricity</b>	X		X	X	X		X		
<b>Oil, fat, additional variable cost</b>		X	X	X	X	X	X	X	X
<b>Tyres</b>		X				X			
<b>Telephone, telecommunication, radio</b>	X	X	X	X	X	X	X	X	X
<i>Stock turn</i>									
<b>Loading / Unloading</b>	X								
<b>Transshipment</b>			X	X					
<b>Shunting, marshalling, rearrangement</b>			X		X				
<b>Storage of goods</b>	X		X	X					
<i>Time</i>									
<b>Waiting time</b>		X	X	X	X				
<b>Rest time for driver</b>						X			
<b>Parking, port liner terms charge</b>			X			X		X	X
<i>Organisation costs</i>									
<b>Monitoring</b>	X	X	X	X	X	X	X	X	X
<b>Safety test</b>	X	X	X	X	X	X	X	X	X
<b>Disposition of wagon/vehicle fleet</b>	X	X	X	X	X	X	X	X	X
<b>Additional keeping ready of wagons and means of transport</b>									
<b>Disposition of cargo / good – dispatching, conducting, co-ordination</b>	X								
<b>Operational cost for the network (rail/waterway – signalling, station and network management)</b>			X		X		X	X	X
<b>Management / Transaction</b>	X	X	X	X	X	X	X	X	X
<b>Fuel, diesel</b>		X			X	X	X	X	X
<b>Electricity</b>	X		X	X	X		X		



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# Calculating internal costs

Cost item	Measurement unit	FC	VC	Functional conversion to Euro/loading unit (LU)	Data requirements / calculation Remarks
<b>Personnel</b>					
Gross wage / salary of driver	Euro/year	I	I	$\frac{\text{EURO}}{\text{year}} \bigg/ \frac{\text{LU}}{\text{year}} = \frac{\text{EURO}}{\text{LU}}$	(Var. because of bonus for week end) a) Company which only provides pre- and post haulage: i. Number of persons, employed in the company ii. Wage, social security and overheads per worker per year iii. Number of LU per year b) Company which provides all kinds of haulage: i. Number of persons, employed in the company ii. Wage, social security and overheads per worker per year iii. Number of LU per year iv. The share of the pre and post haulage of the total transportation job.
Social security	Euro/year	I			
Overhead	Euro/year	I			
Expenses incurred by the driver	Euro/h		I	$\frac{\text{EURO}}{\text{h}} \times \frac{\text{h}}{\text{LU}} = \frac{\text{EURO}}{\text{LU}}$	i. Travel time needed with each MoT. It depends on the mileage and on the average speed ii. Number of LU per MoT iii. Kind of transport companies (e.g. own auxiliary equipment or not) iv. Organisational form for distribution (e.g. vehicles for pre-post haulage only, road hauliers providing pre-post haulage as long distance transport, etc.)  <b>Note:</b> For short standard distances this cost is also evaluated in terms of a [Euro/year], i.e. a flat rate is used

# Calculating external costs

- External cost categories: pollutants, noise, accidents, congestion/scarcity, GHG
- Impact Pathway, except for GHG (EU-wide reduction target)
- LCA includes vehicles, fuels, Loading Units (no infrastructure provision)
- Segments of variable length
- Reference (average) vehicle (device, technology, etc.)
- Impacts on health, crops, building materials, climate change, expressed in Euro/LU (and Euro/tonne of pollutant)

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# 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;**

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## External costs: Genoa-Rotterdam, intermodal

Mode: Train (Genova-Basel)			AIR POLLUTION (including Global Warming)		
Country	From	To	Energy Consumption (kWh/LU)	External costs (Euro/100kWh)	External Costs (Euro/LU)
IT	Genova	Chiasso	89,6	3,32	2,97
CH	Chiasso	Basel	805	0,23	0,48
<b>TOTAL</b>			<b>298,1</b>		<b>3,45</b>

# External costs: Genoa-Rotterdam, intermodal

MODE : Barge (Basel-Rotterdam)			AIR POLLUTION		GLOBAL WARMING			
Country	From	To	Damage (Euro)	External costs (Euro/LU)	CO2 Emissions (t)	External costs (Euro/ + CO2)	Damage (Euro)	External costs (Euro/LU)
DE	Basel (Hünigen)	Straßburg	682,16	9,02	4,10	37	151,79	2,01
DE	Straßburg	Speyer	455,73	6,03	3,35	37	124,12	1,64
DE	Speyer	Koblenz	673,36	8,91	6,20	37	229,43	3,03
DE	Koblenz	Düsseldorf	489,78	6,48	4,75	37	175,60	2,32
DE	Düsseldorf	Border NL	420,40	5,56	4,19	37	155,11	2,05
NL	Border NL	Gornichem	326,73	4,32	3,05	37	112,68	1,49
NL	Gornichem	Rotterdam	275,68	3,65	1,98	37	73,28	0,97
NL	Rotterdam Container port		84,32	1,12	0,69	37	5,36	0,34
<b>TOTAL</b>				<b>45,08</b>				<b>13,85</b>

# External costs: Genoa-Rotterdam, all-road

Mode: by road			AIR POLLUTION		GLOBAL WARMING			
Country	From	To	Damage (Euro)	External costs (Euro/LU)	CO2 Emissions (t)	External costs (Euro/ t CO2)	Damage (Euro)	External costs (Euro/LU)
IT	Voltri-harbour	Chiasso	14,24	7,12	0,14	37,00	5,25	2,63
CH	Chiasso	Basel	30,84	15,42	0,45	37,00	16,56	8,28
DE	Basel	Venlo	39,70	19,85	0,64	37,00	23,50	11,75
NL	Venlo	Rotterdam Terminal	13,46	6,73	0,22	37,00	8,29	4,14
<b>TOTAL</b>				<b>49,12</b>				<b>26,80</b>

## Genoa-Rotterdam corridor AIR POLLUTION and GLOBAL WARMING: comparison between intermodal and all-road

Impact	By Train	By Barge	Intermodal solution	All-Road solution
<b>AIR POLLUTION</b> External cost in Euro/LU	3,45 (including GW)	45,08		49,12
<b>GLOBAL WARMING</b> External cost in Euro/LU	-	13,85		26,80
<b>TOTAL (Euro/LU)</b>	3,45	58,93	62,39	75,92

European Parliament  
Brussels, 20-21 December 2001

# RECORDIT Final Conference

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