INTERNATIONAL WORKSHOP ON GREEN CORRIDORS European Experience and Brazilian Perspectives

An overview of implementing Green Corridors in Europe

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Presentation topics

- 1. The 'green corridor' concept and examples
- 2. The SuperGreen project: Basic results
- 3. The corridor benchmarking methodology
- 4. The European TEN-T core network corridors
- 5. The GreCOR application

Transport corridors are not new





The corridor approach in EU policy



The 'blue banana' corridor

- Dec. 2002:
 Brenner Action Plan (DE, AT, IT)
- Jan. 2003: MoU on Corridor A (NL, DE, CH, IT)
- Mar. 2005: MoU on 6 ERTMS corridors (EC, CER, UIC, UNIFE, EIM)



The 'green corridor' concept



Green Corridors are a European concept denoting long-distance freight transport corridors where advanced technology and co-modality are used to achieve energy efficiency and reduce environmental impact

Freight Transport Logistics Action Plan (2007)



The 'green corridor' features



- 1. Concentration of freight traffic
- 2. Co-modality and advanced technology
- 3. Adequate transhipment facilities
- 4. Green propulsion
- 5. Demonstration of innovative transport solutions
- 6. Fair and non-discriminatory access

The 'green corridor' benefits





- Shift of cargoes away from roads
- Improved competitiveness of rail and waterborne transport
- Optimisation in terms of energy use and emissions
- Effective consideration of interoperability problems (international character of corridors)
- Enhanced cooperation
- Improved chances of identifying workable solutions (focus on a subset of the network)
- Reduced requirements for expansion of network capacity (co-modality)



East-West Transport Corridor (2006-2012)



Swedish Green Corridors Initiative (2008-2012)







STRING corridor (2011-2014)





Midnordic corridor (2010-2013)



SuperGreen identity



- Type of project:
- Financed through:
- Duration:
- Consortium:
- Leader:
- Total budget:
- Objectives:

- Coordination and Support Action
- 7th Framework Programme
 - 3 years (Jan. 2010 Jan. 2013)
- 22 partners from 13 countries
 - National Technical University of Athens
- ~ 3.5 mio EUR
- Support the EC on green corridor issues
- Benchmark green corridors (through KPIs)
- Deliver policy and R&D recommendations
- Undertake stakeholder networking activities

Selection of corridors



The initial list of KPIs

Efficiency	Absolute cost Relative cost	€/tonne €/ton-km
Service quality	Transport time Reliability (time precision) Frequency of service ICT applications (availability and integration of cargo tracking and other ICT services)	hours % of shipments on time number per week scale 1-5
	Cargo security Cargo safety	incidents/shipments incidents/shipments
Environmental sustainability	CO ₂ -eq SOx NOx PM ₁₀	g/ton-km g/ton-km g/ton-km g/ton-km
Infrastructural sufficiency	Congestion Bottlenecks (incl. geography, infrastructure capacity & condition, administration)	average delay/ton-km scale 1-5
Social issues	Land use (urban & sensitive areas) Traffic safety Noise	% of buffer zone fatal.& ser.injur./mio ton-km % of length >50/55 dB

The final list of KPIs

Relative transport cost (to the user)€Transport time (or speed)hReliability (on-time delivery)%Frequency of servicenCO2-eq emissionsgSOx emissionsg

€/ton-km hours (or km/h) % of shipments number per year g/ton-km g/ton-km

BUT

KPIs should be selected by the corridor management on the basis of the objectives being pursued

The initial methodology

- 1. Decompose the corridor into a set of typical transport chains
- 2. Calculate KPIs for each chain
- 3. Aggregate chain- to corridor-level KPIs
- 4. Aggregate corridor-level KPIs into a single corridor indicator

Benchmarking results

Corridor	Mode	Cost (€/tkm)	Av. speed (km/h)	Reliability (%)	Frequency (no/year)	CO ₂ (g/tkm)	SOx (g/tkm)
Brenner	Intermodal	0.03-0.09	9-41	95-99	26-624	10.62-42.11	0.02-0.14
	Road	0.05-0.07	19-40	50-99	104-2.600	46.51-71.86	0.05-0.08
	Rail	0.05-0.80	44-98	50-100	208-572	9.49-17.61	0.04-0.09
	SSS	0.04	23	100	52	16.99	0.12
Cloverleaf	Road	0.06	40-60	80-90	4.680	68.81	0.09
	Rail	0.05-0.09	45-65	90-98	156-364	13.14-18.46	0.01-0.02
Nureyev	Intermodal	0.10-0.18	13-42	80-90	156-360	13.43-33.36	0.03-0.15
-	SSS	0.05-0.06	15-28	90-99	52-360	5.65-15.60	0.07-0.14
Strauss	IWT	0.02-0.44	-	-	-	9.86-22.80	0.01-0.03
Mare Nostrum	SSS	0.003-0.20	17	90-95	52-416	6.44-27.26	0.09-0.40
	DSS	-	-	-	-	15.22	0.22
Silk Way	Rail	0.05	26	-	-	41.00	-
	DSS	0.004	20-23	-	-	12.50	-

• Very low speed for road transport (probably due to delays in terminals)

- Very high variance of intermodal transport attributes (due to different characteristics)
- The EcoTransIT World emission calculator was used for estimating emissions

The final methodology

- **Step1:** Disaggregate corridor into typical transport chains according to the transport market study
- **Step2:** Estimate KPI values for each and every chain of the corridor
- **Step 3:** Aggregate these values into corridor level KPIs by using weights and methods specified in the transport market study
- Step 4: Use the same sample to monitor performance in subsequent years (equivalent to the basket of goods/services used for calculating and reporting CPI)

The new EU infrastructure policy (2013)

Comprehensive network (2050)

- directly reflects the relevant existing and planned infrastructure in Member States
- involves updating and adjustment of the current TEN-T

Core network (2030)

- overlays the comprehensive network
- consists of its strategically most important parts
- constitutes the backbone of the multimodal mobility network
- concentrates on the components of TEN-T with the highest European added value: cross border missing links, key bottlenecks and multimodal nodes

The TEN-T core network corridors

- comprise the instrument for the coordinated implementation of the core network
- consist of parts of the core network
- involve at least three transport modes
- cross at least three Member States
- cover the most important cross-border longdistance flows in the core network
- include at least one maritime port and its accesses



Green vs. TEN-T core network corridors

Geographical considerations



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Green characteristics

- Reliance on co-modality
 - ✓ adequate transhipment facilities
 - ✓ integrated logistics concepts
- Reliance on advanced technology
 - ✓ energy efficiency
 - \checkmark use of alternative clean fuels
- Development/demonstration of environmentally-friendly and innovative transport solutions, including ICT applications
- Collaborative business models

A green corridor is efficient. An efficient corridor is not necessarily green.

Green vs. TEN-T core network corridors

Conceptual considerations

All characteristics that make a corridor green are more or less met by the concept of TEN-T core network corridor



The new TEN-T policy has established a network of green corridors in Europe (freight dimension)

The GreCOR application



Revised methodology

- Use transport model results (Danish National Traffic Model) to construct the sample of typical transport chains
- Exploit GreCOR data as much as possible for estimating the KPI values
- Address potential gaps in information through well focused interviews with stakeholders
- Use transport model results to calculate the weights needed to aggregate KPIs from chain- to corridor-level

Data structure

- Base year = 2010
- 351 zones
- 23 commodities
- 3 modes
- 14 vehicle types
- 25 types of transport chains
- 2.934.717 entries (~ 507 mio tonnes)
- Entry = transport chain (<=3 legs)



Sample construction

Criteria for selection:

- Relative importance
- Degree of homogeneity
- Sensitivity to external influences
- Stability
- Adequate definition



"Land border" road chains of Commodity group 22 (fertilizers)

Conclusions

Mode	KPI Indexes					
	COST	SPEED	FREQ.	CO ₂ -eq	SOx	
Road	344,6	217,5	23,3	113,9	80,4	
Rail	79,0	154,4	14,0	69,5	50,1	
Shipping	42,6	50,8	133,7	65,9	92,8	
Ro-Ro shipping	158,1	233,9	14,4	540,2	284,9	
Grand total	100,0	100,0	100,0	100,0	100,0	

The method permits monitoring of the performance of a single corridor over time.

It is not suitable for comparisons between corridors.

For more information

- <u>http://supergreenproject.eu/</u>
- http://www.grecor.eu/
- <u>Green Transportation Logistics: the Quest for Win-Win Solutions</u>, H.N.Psaraftis (ed.) Springer, 2015



THANK YOU for your attention