Evaluer la durabilité du transport de marchandises: une approche en termes de trajectoires servicielles

Evaluating freight transport sustainability: A service trajectory approach

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Structure of the paper

1. Stakes of sustainability
   - Sustainability vs. Competitiveness …
   - Evaluation methods: productivity, ton-km
2. Freight transport in service economics
   - Alternative framework: performance
   - Innovation in freight transport ?
3. Multidimensional framework
   - Conventionalist analysis of performance
   - How do actors adjust to sustainability ?

Recent evolution of mode shares in freight transport in France

% of total t-km)	1990	2006
Road	79,3 %	88,1 %
Rail	18,2 %	9,9 %
Inland Waterways	2,5 %	2,0 %

Grenelle vs. Competitiveness?

- Declining competitiveness of French road haulage in Europe
    - Share of French road haulage firms in international freight (25 European countries, in % of ton-km)

2003	2005
29.1 %	19.7 %

- Public debate on external costs of transport

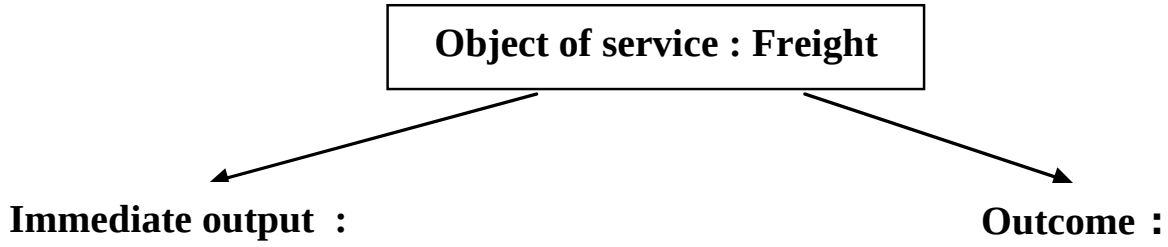
Transport as analysed in the service literature

- Standardized, material services *(Tether et al., 2001)*
- Supplier-dominated user of innovations *(Pavitt, 1984; Evangelista, 2000; van Ark et al., 2003)*
- Low R&D expenditures
- Low rate of innovation
- Low share of highly qualified personnel *(Tether et al., 2001; Vence/Trigo, 2007)*
- No or little cooperation *(Vence/Trigo, 2007)*
- Incremental, market-oriented innovation *(Hollenstein/Heinz, 2003)*

From simple to complex trajectories in freight transport

Service operations	Innovation trajectory	*Typical actor in freight transport*
(M)	Material logistics trajectory	*SNCF* *Traditional road haulage*
(M) + (I)	Development of an information trajectory (ICT)	*Large –scale road haulage firms*
(M) + (I) + (C) **or (I) + (C)** **or (C)**	Complex methodological trajectories (supply chain management)	*Third Party Logistics Provider*
(M) + (R)	Survival of relational strategies	*Very small road haulage firms*

Output and outcome in freight transport



- *Handling of good;*
- *Distances covered ;*
- *Tons or volumes forwarded ;*
- *Puncuality of deliveries*
- *Value added*
- Emission of pollutants
- Number of accidents ; etc.

- *Efficiency of the distribution system*
- *Geographical area covered*
- *Reliability*
- *Just-in-time;*
- *Flexibility;*
- *Stability of the distribution network*
- *Input to information flows*
- *Supply chain management*
- *Adaptation to production rythms*
- Road safety
- Social climate
- Climate change, pollution
- Congestion, etc.

A multi-criteria framework of performance in freight transport

	Industrial world	Market world	Domestic world	Civic world	World of inspiration	World of opinion
Direct output	Transfer of goods in space	Make goods available to the customer	Quality of service Quality of relations Trust	Compliance with social, technical and environment-tal legislation and regulations	Innovation in the information and management system of the supply chain	Contribution to brand image of the good (eg. advertising on trucks)
Indicators for direct perfor-mance	*Tons, volume, distances, ton-km, productivity*	*Transport cost* *Lead times*	*Quality indicators* *Turnover of service providers*	*Driving offences, undeclared work etc.*	*Contribution to iinformation systems of the supply chain*	Brand image
Outcome (long term)	Efficient and reliable distribution system	Efficient consumer response	Stable and experienced distribution network	Environmental, social and spatial impacts of freight transport	New modes of transport, new organisation of transport	Contribution to the image of the transport mode in the public
Indicators for indirect perfor-mance	*Reliability, geographical area covered, adaptation to production rythms*	*Contribution to profitability of the supply chain,*	*Type of contracts between the shipper and the transport provider*	*Contribution to pollution, congestion, road safety*	Diffusion of new ideas and organisation	Image of transport mode in the public Acceptability of transport
Typical actors	Transport operators (heavy modes) Ministry of Transport	Logistic service providers, large-scale distribution firms	Small transport firms	Ministry of Environment, NGO, associations	Researchers	Large firms advertising their actions towards sustainability; public opinion
Improvement of performance through …	*Investment in infrastructure; material innovation*	*Organisation of flows, SCM, ECR, tracing & tracking*	*Face-to-face contacts with clients; social networks*	*Regulations, legislation*	*Research; encouraging new ideas and creativity*	*Certification, communication*

Adjusting to sustainability

	Industrial world	Market world	Domestic world	Civic world	World of inspiration	World of opinion
Sustainable transport service	Alternative transport modes Clean trucks Intelligent freight	Shift of optimum (location and circulation of goods)	Local systems of goods transport	Mobility of goods that complies with environmental & social rules	(Radically) new services, new organisations	Clean, invisible transport
Objectives	*Growth of freight flows with lower external effects*	*Profitability, market shares without compromising social acceptance*	*Develop local networks*	*Social acceptability of transport* *Collective welfare*	*Less transport* *Dematerialisa-tion of goods and transport*	*Develop a « clean » image*
Evaluation	Measure of externalities	Cost, reliability, flexibility, profits	Stability of local networks	Social welfare, HDI, ISEW …	Innovativeness Degree of novelty	Public opinion
Improve-ment of perfor-mance through …	*Investment in alternative transport modes* *Investment in « clean » technologies*	*Location of production and logistic sites, development of information flows*	*Long term contracts, direct sales networks*	*Social and environmental regulation and laws*	*Research Alternative networks (eg. « compact »)*	*Environmental quality labels* *Communica-tion, advertising*
Definition of sustain-ability	Brundtland internalisation of external costs	Social responsibility of the firm	Social development « localism »	Social welfare	Décroissance Demateriali-sation	Idealised vision of « green » development

Conclusion

1. Performance as a convention
   - multicriteria framework instead of one (or a few) indicators
2. Multiple definitions of sustainability
   - Actors adapt their strategies to a new constraint.
   - Public debate and public policy is limited to one or two definitions.