Institute for Railway Engineering
and Transport Economy

New Chances through New Technologies (!?)

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Vienna, 22nd of June 2006

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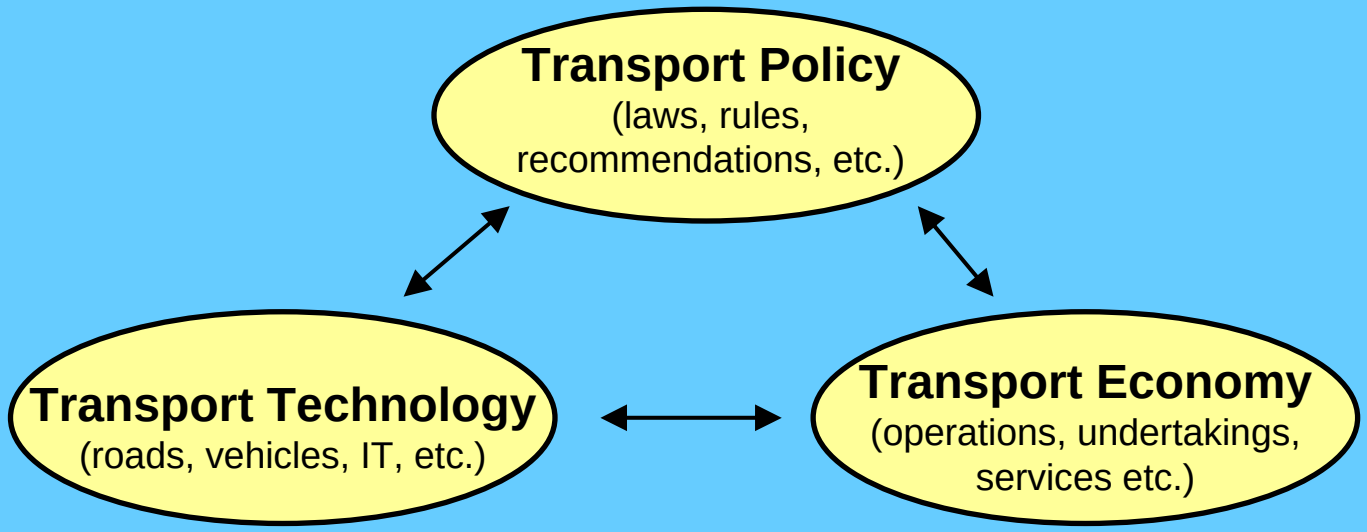
„Trinity of Transport“



Change in one field causes alterations in the others

Impact to changes is non-satisfaction with an established practice

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Scheme of present operation in combined rail freight transportation

- Long distance run > transfer station
- Change of loco > dieselloco > shunting into terminal
- Unloading with portalcrane
  - onto lorries
  - onto waggons when stationary
- shunting with diesel > stabling > shunting with diesel
- loading with portalcrane
- shunting with dieselloco > transfer station
- > electric loco > long distance run under catenary

„When the GOOD LORD invented Railways, the DEVIL came – and invented shunting!“

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Basic question:

- Can goods be manipulated
  - simpler ?
  - thus quicker?
  - thus with higher performances?
  - thus with less cost?

and

- can freight-trains run with speeds of 120 km/h or more?

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This is **NOT** a question of improving
DETAILS,
but calls for considerations
for the **ENTIRE** system
„combined freight transport“

and thus must deal with
manipulation of freight and
long-distance-movement

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Thus: twin-model of thoughts

Innovative Freight Terminal

- arrival at loading track with long-distance loco under catenary
- loco remains on train
- manipulation of goods with „fast“ loading equipment
- departure with long-distance loco under catenary
- thus strict time-table for these „line-trains“

Line Train System

- trains run on predetermined routes in a time-table even overdays
- goods jump on and off
- trains with given lengths
- trains consist of loaded and unloaded cars in a non-determined sequence
- maximum length = capacity
- braking problems to be solved by controls

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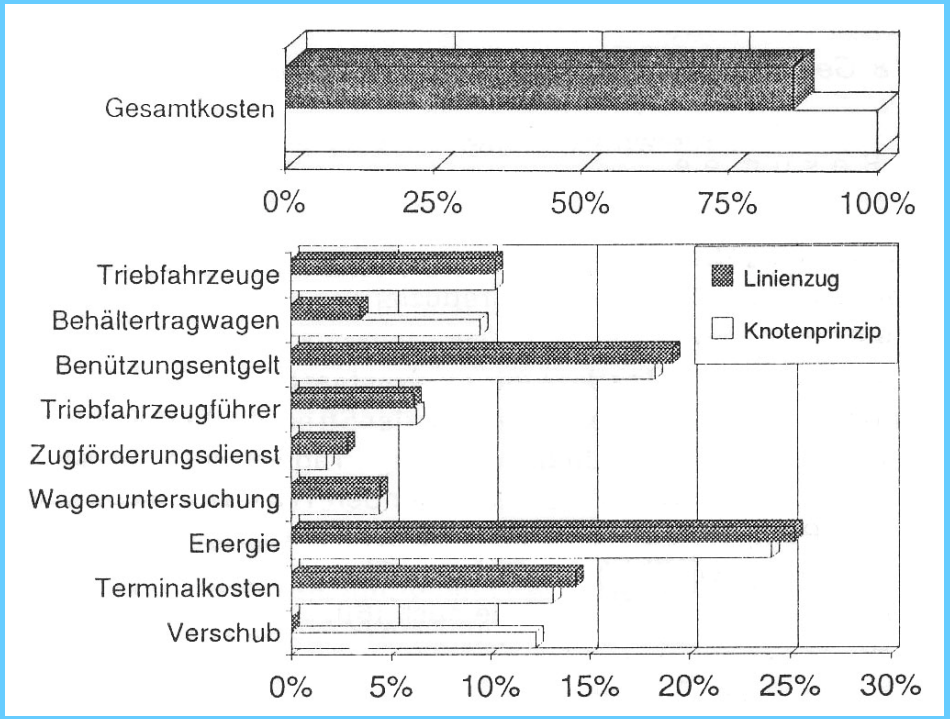
cost comparison based on present transport needs



- total cost of scheduled-train-system about 15 % LESS
- even with non-optimal conditions (like unbalanced transport flows)
- cost advantage of scheduled-train-system grows with the load factor

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high-performance terminals

- high transfer capacity FROM and TO scheduled trains
- for instance by side-loading machines etc. under grounded catenary

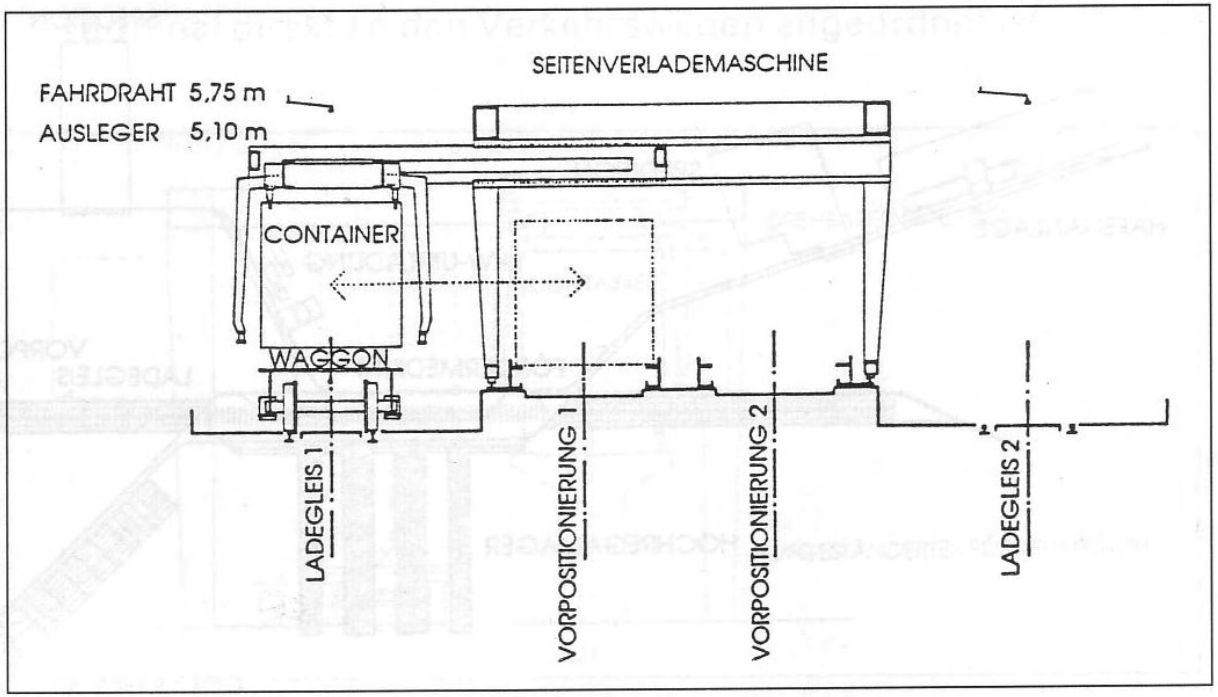

Bild 10: Umladen unter der Oberleitung

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high-performance terminals

- separation of transport flows by intermediate storing capacities (f.i. high floor stores)
- shortest stopover-times for scheduled trains
- NO shunting
- compact installations for integration into cities
- short road approaches
- little space requirement (extensions to be kept in mind)
- interconnected-information-flow

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high-performance terminals

- high performance inner logistics (f.i. driverless manipulation)

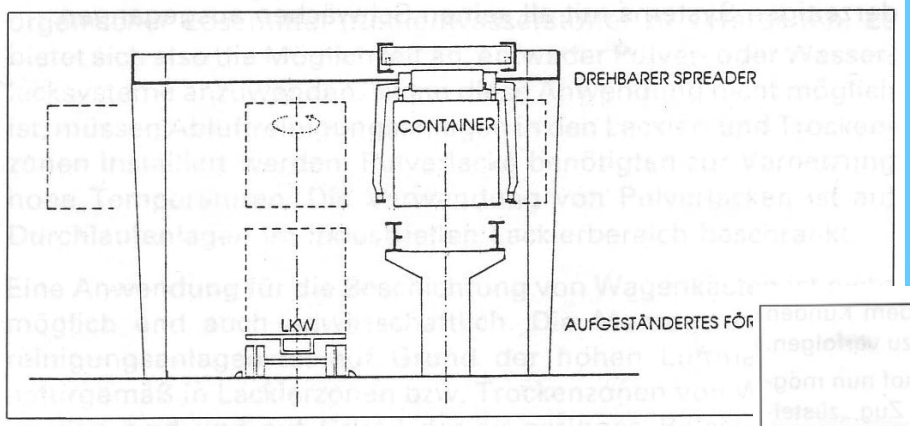

Bild 15: Lkw-Umlademaschine

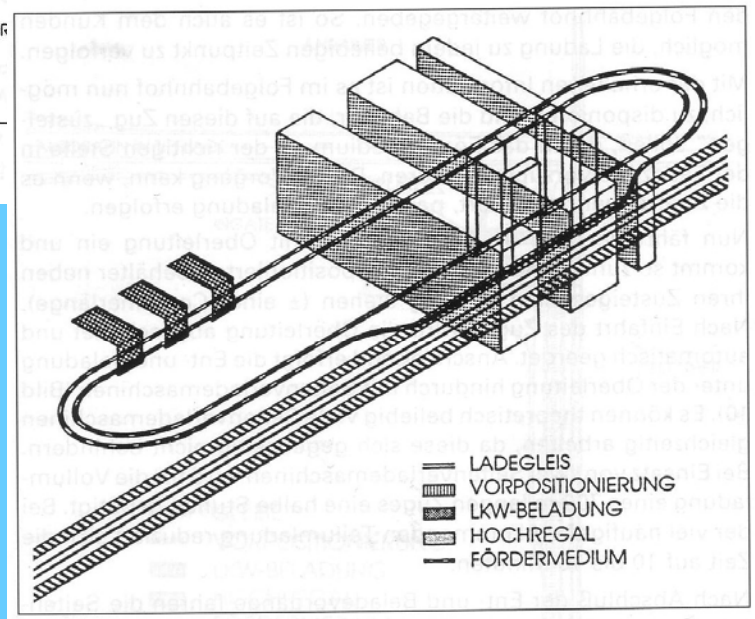

Bild 9: System Hochleistungsterminal (HoT), schematische Darstellung

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Line-train-System

- scheduled-trains are superior even in smaller, less occupied networks
- freight transportation overday would need
  - cars with higher speed capacity (V > 120 km/h)
  - cyclic timetable for freight transport
  - would allow the following transport times
    - Hamburg – Köln 6h
    - Hamburg – München 9h
    - Hamburg – Wien 13h (today 1 1/2 days!)

- circle routes possible to connect „fitting“ terminals
- centralised transport logistics permits short-term disposition
- high performance terminals of a new type

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Conclusion 1

- rail freight today suffers a technological standstill
- performance limits became visible
- many detailed developments have been
  - started
  - realised
  - tested
  - but have not gripped ground in daily practice

Examples:

- **Low Noise Train LNT**
- **derailment detector**
- **braking systems**
- **higher speeds**
- **tracing of loads etc**

- a concise strategy for innovation does NOT exist
- multiple groups voice differing priorities

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Conclusion 2

- combined rail freight transport CAN be developed to considerably higher tonnages

- the development of combined transport should not become stuck in the jungle of short-sighted advantage-hunting

- innovation at large scale requires
  - dirigism or
  - common understanding and joint efforts

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Literature :

• Posch, K.-H., Schneider, K.: Hochleistungsterminal – ein innovatives System zur Leistungssteigerung im kombinierten Verkehr [ZEV+DET Glasers Annalen 118(1994) Nr.2/3, S 206]

• diploma works at the Institute for Railways Engineering and Transport Economy, Technical University Graz

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Thank you for your attention…

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