CargoBeamer: land cargo transport 2.0

Sustainable and ecological combined rail transport for all semi-trailers

International Transport Forum
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CargoBeamer AG
Fast growth in road cargo creates significant external costs – road maintenance, environmental damages and more

For example, in Germany each day:

- more than 1 million heavy trucks use the “Autobahn”
- around 150,000 heavy trucks pass the German borders
- as a consequence of heavy road cargo, it is estimated that there are an extra 35bn€ of “external costs” for short-time repair and maintenance of roads and bridges

*source: BAG: Bundesamt für Güterverkehr Mautstatistik 2012*
Road cargo takes 76% of land cargo volume in the EU but accounts for 96% of external costs!

<table>
<thead>
<tr>
<th>Mode</th>
<th>Volume [bn tkm p.a.]</th>
<th>Percentage [%]</th>
<th>External Cost [bn € p.a.]</th>
<th>Percentage [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road cargo</td>
<td>1.734,1</td>
<td>76,1%</td>
<td>62,6</td>
<td>95,6%</td>
</tr>
<tr>
<td>Combined rail / road cargo</td>
<td>124</td>
<td>5,4%</td>
<td>0,7</td>
<td>1,0%</td>
</tr>
<tr>
<td>Rail cargo</td>
<td>420,0</td>
<td>18,4%</td>
<td>2,2</td>
<td>3,4%</td>
</tr>
<tr>
<td>Sum</td>
<td>2.278,1</td>
<td></td>
<td>65,5</td>
<td></td>
</tr>
</tbody>
</table>

Data: EC, UIC, Eurostat
Photo: DB, Logwin

Combined Transport Road / Rail (CT)
The external costs of rail transport are much less than road cargo

Average external cost of cargo transport modes (CE Delft, 2011)
- Road truck: 36.1 € / 1000 tkm
- Rail cargo: 5.3 € / 1000 tkm

A shift of 5% of EU road cargo volumes to rail would reduce external costs by 2.7 bn € per year.
The problem further increases: road cargo growth outperforms both rail cargo and road infrastructure growth.
Problem driver (1): Most road trailers are not compatible with rail transport (w.r.t. handling via container cranes)

- 2.0% “liftable” trailers
- 3.1% container on chassis
- 7.3% other smaller trucks
- 8.9% Truck/Trailer
- 14.0% Swap Body
- 63.8% “non-liftable” semi-trailer

* Average, Germany
Source: KBA / DESTATIS
Problem driver (2): In mid-Europe, the realisation of many additional conventional rail/road terminals is problematic

- Massive space and additional infrastructure requirements
- Very long legal authorisation procedures (5 – 10 years)
- Very high investments (30 – 50 M €)
- Limitations: no handling of standard semi-trailers

- No significant increase in modal shift capacity of conventional road/rail terminals expected
CargoBeamer can solve these problems

Key features:

1) **Rail transport of all semitrailers**
   Transport of all semi-trailers, including the 95% of standard, “non liftable” trailers which cannot be craned

2) **Full compatibility to existing terminals**
   Loading palette is compatible to container crane

3) **Compact and efficient terminals**
   Automated terminals enable a fully automated “deload/load sequence” of a full train within 15 minutes (e.g. 36 de-boarding and 36 boarding semi-trailers)

4) **Automated rail gauge transhipment**
   Seamless interconnection between European and Russian rail network standards
CargoBeamer can solve these problems (cont.)

1. Transport of all semi-trailers

CargoBeamer uses a universal loading palette – which is part of the wagon. All semi-trailers fit onto these palettes – at once, without any modifications.

... and road meets rail.
CargoBeamer can solve these problems (cont.)

2. Compact and efficient terminals

CargoBeamer terminals represent a new generation:

- very compact size  – ¼ of container crane terminals
- very low investments  – ¼ of container crane terminals
- usable for all semi-trailers  – not only for container transports
- full automation  – very low operational cost.

Compact terminals fit almost everywhere - renaissance of industrial rail interfaces.

<table>
<thead>
<tr>
<th>CargoBeamer Compact3 1x12</th>
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</thead>
<tbody>
<tr>
<td><strong>Investition:</strong></td>
</tr>
<tr>
<td><strong>Capacity:</strong></td>
</tr>
<tr>
<td><strong>Length:</strong></td>
</tr>
<tr>
<td><strong>Square area:</strong></td>
</tr>
<tr>
<td><strong>Train stop:</strong></td>
</tr>
<tr>
<td><strong>Staff size</strong></td>
</tr>
<tr>
<td><strong>Operational cost:</strong></td>
</tr>
</tbody>
</table>
CargoBeamer offers significant benefits for society

✓ CargoBeamer reduces energy consumption for transports by 74% [2]
  ▪ Per train and year: energy savings amount to 15,4 GWh
✓ Each CargoBeamer train reduces CO₂ emissions by 3,500 to p.a. [2]
✓ Each CargoBeamer train reduces external costs of transport by 3,6 Mio. € p.a. [1],[2]
  ▪ Road maintenance
  ▪ Emissions
  ▪ Accidents and related cost
✓ Each CargoBeamer train reduces congestion cost by 2,6 Mio. € p.a. [1]

CargoBeamer provides sustainable electromobility for trucks

CargoBeamer is operational

CargoBeamer terminal in the Volkswagen main plant in Wolfsburg
The automated terminal has a capacity of 25,000 moves / year.
CargoBeamer is operational (cont.)

In January, 2014, first passage of standard 4m high trailers through the existing Gotthard rail tunnel
In addition to automated CargoBeamer terminals, operation in all existing conventional rail/road terminals is possible, too. The CargoBeamer palette can be lifted with container cranes or ReachStacker’s, enabling all standard “non-liftable” semi-trailers to be transported on rail.
Market introduction in Europe 2013 - 2015

2013  Pilot project Volkswagen AG

2013  Operation on Lübeck-Duisburg route

2014-  Projects on major EU axis

North-South:
  Benelux/Germany - Italy

East-West
  Baltic States – Poland – Germany
  Poland - Germany – France
About us

Key Facts
- Privately owned shareholders company
- 2003: Founded in Germany
- 2008: Active start of technology implementation
- 2011: Technology Developments completed
- 2012: Market introduction and customer projects
- 2013: Regular Operations begin

Profile
- CargoBeamer® technology ownership and development
- Production and operation of CargoBeamer wagons, eLogistics
- Terminal realisation and operation with partners
Further Questions?

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