CargoBeamer: land cargo transport 2.0
Sustainable and ecological combined rail/road transport for all semi-trailers

International Transport Forum
Leipzig, May 2014

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</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
The external costs of rail transport are much less than external cost of 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 10% of EU road cargo volumes to rail would reduce external costs by 5,4 bn € per year.
The problem increases: road cargo growth outperforms both rail cargo and road infrastructure growth.

Road & rail cargo volume and road infrastructure growth in Germany, 1970=100%. Data source: destatis.
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
  Standard, MEGA-Trailer, Cooling, Silo, Flat – Semi-trailer

* Average, Germany
Source: KBA / DESTATIS

© 2013 CargoBeamer AG
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>
</tr>
</thead>
<tbody>
<tr>
<td>Investition:</td>
</tr>
<tr>
<td>Capacity:</td>
</tr>
<tr>
<td>Length:</td>
</tr>
<tr>
<td>Square area:</td>
</tr>
<tr>
<td>Train stop:</td>
</tr>
<tr>
<td>Staff size:</td>
</tr>
<tr>
<td>Operational cost:</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.
In January, 2014, CargoBeamer and Swiss partner BLS cargo realized first passage of standard 4m high trailers through the existing Gotthard rail tunnel*.

*The existing Gotthard rail tunnel is in operation since 1882 and has a narrow profile which would allow for a maximum height of 3.84m only for semi-trailers on rail. Until 2022 (estimated completion date of modernization works in all tunnels on the Gotthard-route), this narrow „P 384“-profile will restrict combined rail-road transports. Until today, no other rail wagon has received authorization for transportation of standard, 4m high semi-trailers on this route.
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?

Please contact us

CargoBeamer AG
CargoBeamer Rolling Stock GmbH
Hans-Juergen Weidemann
CEO
email: hjweidemann@cargobeamer.com

CargoBeamer Terminal GmbH
Imad Jenayeh
Managing Director
email: ijenayeh@cargobeamer.com

CargoBeamer intermodal operations GmbH
Juan Nagel
Managing Director
email: jnagel@cargobeamer.com