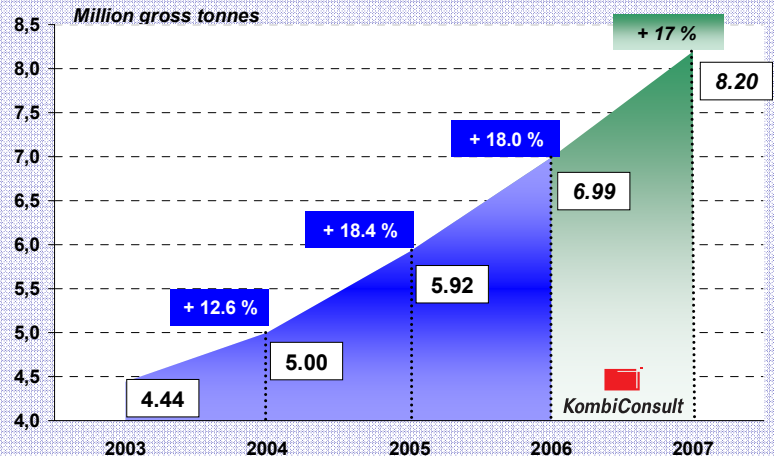


BRAVO - A blueprint for Europe!

Issue 6 - June 2007

Development of unaccompanied Combined Transport at Brenner

An increase in traffic volumes of about 57 percent in unaccompanied combined transport (CT) on the Brenner axis has been reported by the operators and railways, which have been participating in the BRAVO project over the last three years. Thus, its demanding objectives have been fully achieved, as the 120 or so invited experts of the European railway and logistics branch, representatives of the European Commission and transport ministries of Corridor countries learned during the final conference in München (Bavaria) on April 17/18, 2007.



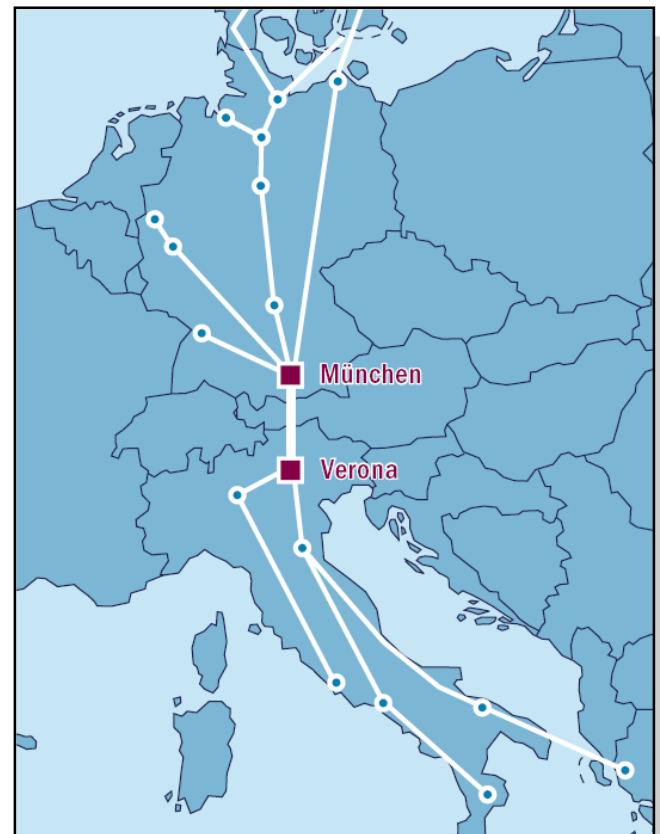
BRAVO Innovations

The remarkable traffic volume development was explained by – among others – the implementation of a range of innovative methods have been developed in the BRAVO-Project, and which are part of the Brenner Rail Freight Action Strategy:

1. Cross-border operation of multisystem-locomotives and loco drivers for efficient and reliable rail transportation of, until recently, more than 2100 trains, and optimised infrastructure capacity use;
2. Radio-remote control of pushing engines as required to haul heavy trains on the steep Brenner north ramp;
3. Megatrailer-pocket wagon (T3000) for maximised mega semi-trailers volume in CT when required by the automotive industry, which have already moved about 75 million tonne-kilometres during the operational trials;
4. Technologies to capture higher swap bodies or even "non-cranable" semi-trailers to CT;
5. Online train monitoring including estimated time of availability (ETA) information accessible to all parties involved in rail transport: railways, CT-operators and CT-Terminals;
6. Internet timetable displaying all direct and GATEWAY-services (and selected ferry routes) for CT customers accessible via www.bravo-project.com;
7. Brenner Quality Manual with ambitious quality objectives, guidance on how to measure them and how they can be achieved by optimising operational procedures.

The Brenner corridor which was used to develop, demonstrate and validate the Action Strategy and the innovations under operational conditions is one of the most loaded trans-European transport corridors, and transiting the sensitive Alpine region.

The strategy is also designed as a blueprint applicable to other pan-European freight corridors.



Brenner Corridor

Project funded under the 6th Framework Programme of the European Commission Directorate-General for Transport and Energy (DG TREN), and by the Swiss State Secretariat for Education and Research (SER)

Brenner Quality Manual

The Brenner Quality Manual does not only include the operational processes but also the quality criteria and respective challenging quality objectives that were agreed upon for the project:

Punctuality

- ◆ 90% (with a max. tolerance of 15 min.) related to MAD (mise à disposition = time of availability)

Reliability

- ◆ Max. train delay of 180 min. related to MAD
- ◆ Changing of annual schedule: latest on Thursday of the prior week

Flexibility

- ◆ Cancellation of regular trains up to 48 hours prior to departure with graduated charge
- ◆ Interim timetable modifications within three months after submission of request
- ◆ Defined reaction time of the Railway Undertakings

Customer Information

- ◆ Real time monitoring of each train;
- ◆ Reporting on Estimated Time of Availability (ETA);
- ◆ Co-ordinated international reporting scheme on actual train journeys incl. train- and wagon-n°

Rolling Stock

- ◆ Monthly agreement on wagon types;
- ◆ 95% rate of use of agreed wagon sets

Transport of documents

- ◆ 99.9% rate of reliability of accompanying transport documents related to 1000 trips



The highlight of the first Conference day was the signing of the management commitment for the implementation of the Brenner Quality Manual by representatives of its counterparts, the active combined transport operators and railways: Kombiverkehr, Cemat, Railion Deutschland, Rail Cargo Austria, Trenitalia, Lokomotion, Rail Traction Company and TX Logistik as well as Intermodal DB Logistics. For the first time, the handbook regulates the optimised border crossing rail transport on one of the most important trans-European rail freight corridors. It has been compiled with the support of KombiConsult in the BRAVO-project.



Signature of the Brenner Quality Manual

From left to right:

Eugenio Muzio, Managing Director Cemat SpA
 Erich Rohrhofer, Head of Business Unit Intermodal RCA AG
 Francesco Grotti, Sales Director Rail Traction Company SpA
 Armin Riedl, Managing Director Kombiverkehr KG
 Rainer Mertel, Managing Director KombiConsult GmbH
 Dr. Harald Schmittner, Managing Director Lokomotion GmbH
 Karl Michael Mohnsen, Chairman of the Board TX Logistik (covered)

The Brenner Quality Manual is available in the working languages German and Italian. Employees of the involved companies taking part in this project have been trained; the processes have been tested during demonstration and continuously improved. They will remain in force after the project.

During the final conference, participants agreed to set a benchmark for other European corridors. Partners of the BRAVO project agreed to continue the established quality working groups and endorse their potential for transfer to other corridors such as the "Tauern" or "Turkey"-corridor.

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BRAVO Customer Information System (CIS)

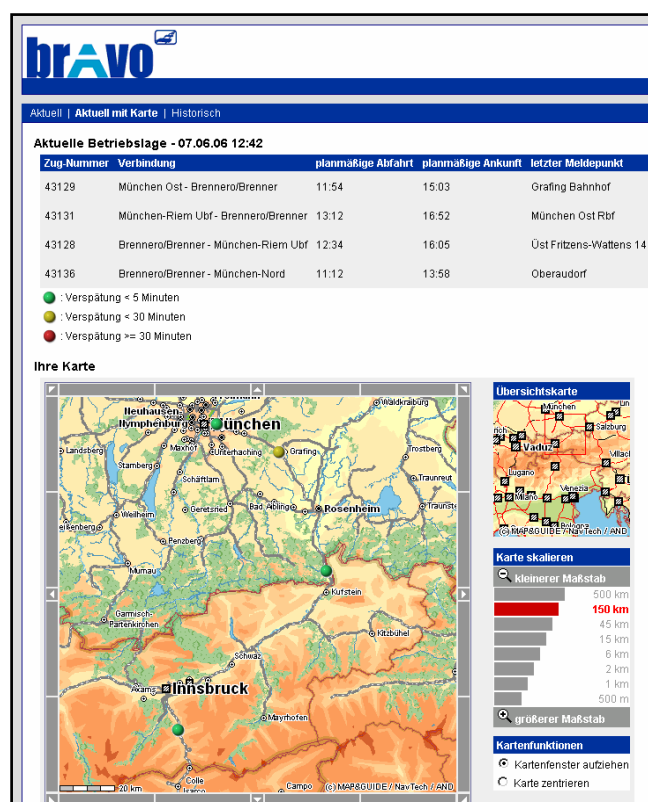
In order to inform customers in case of irregularities, railways and intermodal operators have developed a train monitoring and customer information system (CIS) which has been technically realised by HaCon, Hannover and which allows to monitor cross border train movements in real time.

- ♦ The system is supplied with data from the infrastructure managers DB Netz and ÖBB Netz directly for the trains of Lokomotion.
- ♦ Data on trains of RTC in Italy is provided by mirroring the RFI data, while
- ♦ Railion, RailCargo Austria and Trenitalia have opted to provide information on their trains from own tracking systems via a central data collector/distributor developed in the framework of Use-It.

The BRAVO CIS provides a status of the trains: location, relative delay, reasons of delays and statistical analysis of past train runs.

A tool to deliver the estimated time of availability (ETA) in consideration of train paths and terminal availability has been developed. Information for the customers is performed – as it is already the case today – by the established CESAR system (www.cesar-online.com).

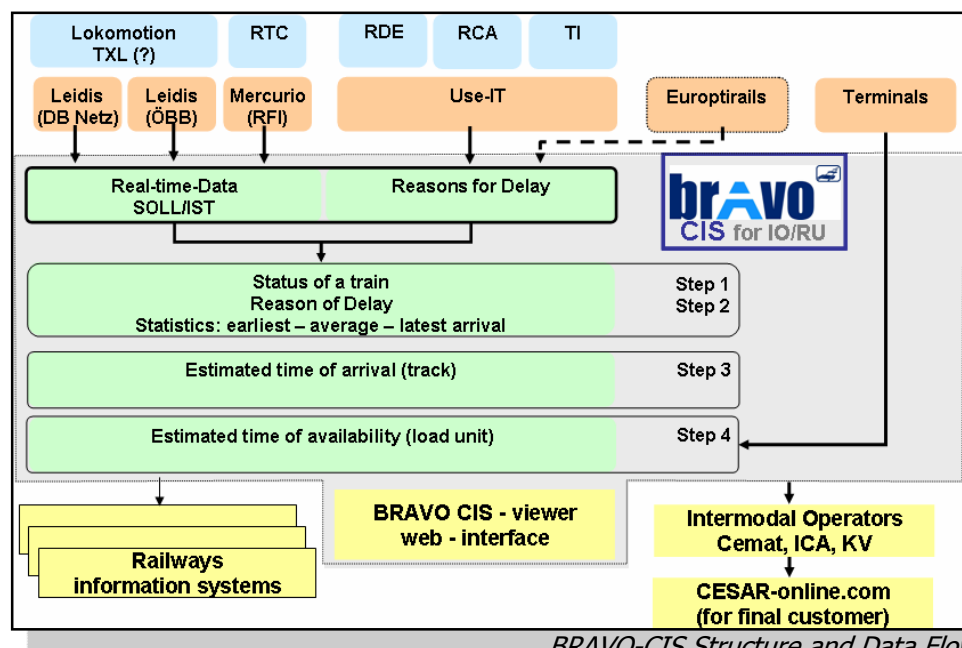
With these newly developed functions the system is targeting small and medium sized railway undertakings. These can monitor their trains on different infrastructures by means of only one uniform system, communicate with their customers in an efficient way and fulfil the requirements of the technical specifications on interoperability (TAF-TSI). But also for CT operators and other rail freight customers the system offers a unique transport control in cross border rail freight transport.



Screenshot of the BRAVO-CIS

Contact for further information:

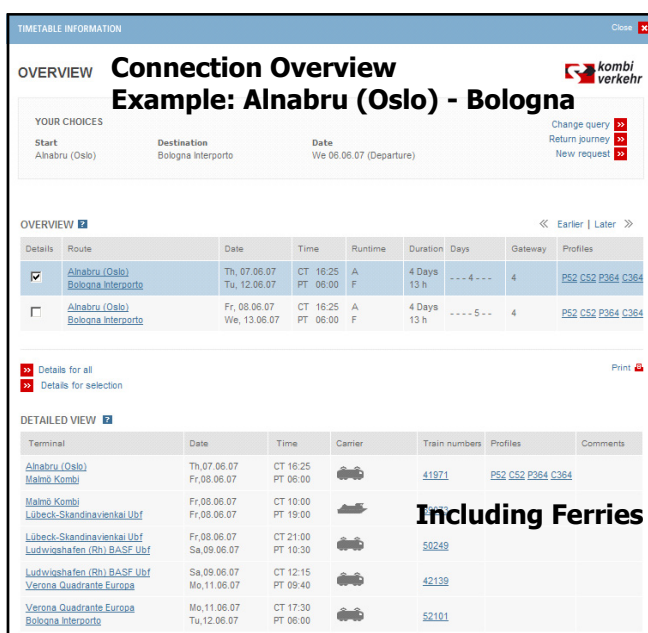
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BRAVO-CIS Structure and Data Flow

Up-to-date and in detail: the new BRAVO timetable information

With the ever increasing number of direct trains and international GATEWAY-relations, the requirements on the CT timetable information have changed dramatically. Today, the services network of UIRR members offers about 15 000 terminal-to-terminal relations – theoretically. It is obvious that these can not be offered in printing. Kombiverkehr's printed time table includes about 200 direct trains and selected GATEWAY-relations, while any other relation has to be looked after manually. In order to reduce the manual search and fully exploit the potential of the current service network, CT-operators have been investigating a solution to provide access to all their relations.



Screenshot Time Table Information System

In the framework of the BRAVO-project, Kombiverkehr has developed a concept that was realised by the Hanover based software company HaCon: the system basically works similar to the time table information system HAFAS, which is known from the public -, and in particular the railway passenger transport, and is accessible via the internet – as a part of Kombiverkehr's new internet site. The system does not only provide for a terminal-to-terminal but also a postal code search option. Therefore also non-frequent users of CT get to know which is the closest and most appropriate terminal for their recent transport demand. The timetable information system depicts a couple of routing possibilities on the basis of the recent direct train and ferry services that are included in the system in less than a second and displays the most relevant ones on the screen.

It provides:

- ◆ Terminal of origin and destination
- ◆ Transport modes (road, rail, ferry)
- ◆ Transport days
- ◆ Date and time of departure and arrival for the entire journey
- ◆ Accepted loading profile

The system calculates also the road distance to the terminals.

Further optional features take into consideration particular requirements of the users such as a specific route, the use of named terminals or the use of direct trains only. The result of the query is a tailor-made time table information with detailed information.

The system also supports the creation of dedicated product information and, last but not least, helps to print the traditional timetable.

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Improvement and extension of Combined Transport services

During the BRAVO project the intermodal operators and railways involved in the project have considerably improved their service network by:

- ◆ linking new terminals to the Brenner corridor such as Lübeck, Duisburg, Herne, Wuppertal, Schkopau, Leipzig, Beiseförth, Kornwestheim, Cervignano, Segrate, Nola (Napoli);
- ◆ increasing the frequency of departures on existing shuttle train relations to multiple departures by week;
- ◆ offering departures during the day on highly frequented relations such as Köln or München to/from Verona;
- ◆ increasing the robustness of the services by levelling out transport velocity and reliability;
- ◆ “through booking” features for GATEWAY connections;

The services are accessible to customers through the companies' websites and business contacts.

Interoperability by Multi-System Locomotives

A central task of the BRAVO project is to improve the interoperability of rail operations through the Brenner Pass.

The independent railway undertakings Lokomotion and RTC have supported Siemens with its new interoperable multi-system locomotive F4 (construction series 189) so that it can be admitted for operations on the Italian rail network. After receiving authorisation, the F4 multi-system locomotive was immediately brought into use on the Brenner Corridor by Lokomotion and RTC for their regular operations. This formed part of the BRAVO project's demonstration activities. Shortly afterwards, some technical difficulties emerged and resulted in the suspension of the continuous traction. Only after the technical problems were sorted out - again with the cooperation of the BRAVO partners and Siemens—the locomotive was successfully operated in interoperable services.



Interoperable traction on the Brenner line

The substantial advantages of using these locomotives are:

- ◆ More productivity by better exploitation of the machines
- ◆ Higher flexibility
- ◆ Reduction of border stopping time, and thus reduction of total travel time
- ◆ Reduction of shunting costs
- ◆ Higher reliability of the service
- ◆ Reduction of utilisation of the border station, increasing its capacity.

During BRAVO too, standard procedures for interoperability with IM's were agreed upon and will continue after the project.



Transition at station Brennero/Brenner

In May 2005, the successful "traction model" was transferred to a new interoperable service which started over the Tauern line, between Cervignano del Friuli and München.

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Radio-remote controlled pushing engines

The BRAVO partner ÖBB/RCA has developed an innovative technology for the operation of pushing engines which are required on the northern ramp of the Brenner Pass for the heavy trains weighing over 1100 tons used in CT. This technology allows the pushing engine, which is located at the end of the train, to be remotely controlled from the train driver's cabin. Therefore, less manpower is required. 20 machines of the type 1144 are equipped with the system, and about 132 drivers were trained to operate the system. With the trials of about 2 000 trains, BRAVO has highlighted that this technique also works perfectly well in tunnels. The final authorisation from the Austrian Ministry of Transport is expected shortly.

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Mega semi-trailers in Combined Transport

The logistics industry is currently investing into "mega" semi-trailers with 100 cubic metres volume and 3 metres interior height which is declared the standard vehicle of the future.



Loading of mega-semi-trailer on the new wagon

Further advantages of Mega-Trailer:

- ◆ 96 (instead of 64) box places
- ◆ 25 t load (comparable to standard-trailer)
- ◆ Universal use for volume and weight goods
- ◆ Large disk brakes / tyres dimension 455/40 R22,5
- ◆ Positive price development by series production

In order to broaden the market potential of combined transport, these trailers shall be loaded in pocket wagon. The new mega-trailer pocket wagon have been developed by the Swiss wagon manufacturer Ferriere Cattaneo in collaboration with Kombiverkehr and Cemat. After performing extensive running-, braking and loading tests the German „Eisenbahn-Bundesamt“ (Federal Railway Office) has certified the wagon to be operated on public railway networks.

Investigation of technical-operational framework conditions of terminals and railway lines and intensive talks to customers have resulted in the selection of pilot relations for demonstration purposes.

Kombiverkehr has introduced the articulated „double“ wagon since May 2006 on their relations Lübeck–Kornwestheim and Stuttgart–Bremen. In the ferry ports cut-off and disposal times are optimally synchronised with the ferry schedules in the Baltic Sea towards Scandinavia and Baltic States. Newly planned relations to be started in June 2007 are:

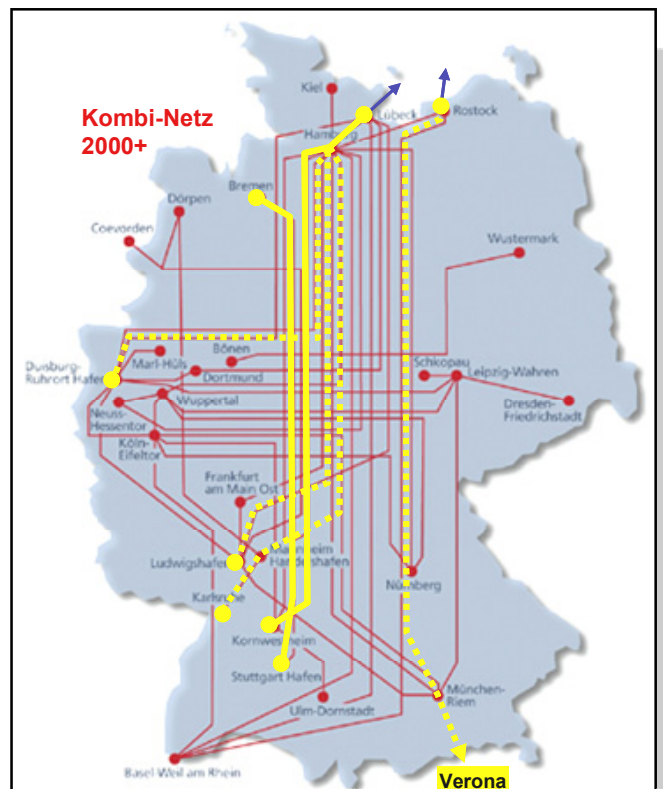
- ◆ Verona – Rostock
- ◆ Ludwigshafen – Lübeck
- ◆ Karlsruhe – Lübeck
- ◆ Duisburg – Lübeck.

Designed as an articulated wagon, the enormous pockets are capable to carry mega trailers of the most modern generation with fixed underrun protection devices, but also conventional trailers, swap bodies and containers up to a length of 7.82 m.

Loading tests with different makes of semi-trailers and loading units as well as Reach Stackers and gantry cranes have proven the capabilities of the wagon. Thanks to a specific safety concept the trailers are fixed by means of their king-pin, only, which eases the transhipment in the terminals.

Technical data of the new mega-trailer pocket wagon:

- ◆ Articulated wagon with 3 bogies
- ◆ Total length: 34.03 m
- ◆ Pocket Length: 12.5 m
- ◆ Pocket Width: 2.7 m
- ◆ For Tyres 455/40 R22.5, max. 2040 mm track
- ◆ Loading length: 2 x 16.1 m
- ◆ Support for king-pin at three different heights (1130, 980 and 880 mm)
- ◆ Safety Concept with „crash elements“ avoid longitudinal adjustment of supporting jack



Piloted services (in yellow)

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Unaccompanied combined transport of conventional semi-trailers

It is still one of the technical burdens of CT chains that semi-trailers have to be equipped with particular devices – gripping edges being the most obvious ones – in order to be transported in unaccompanied CT. Not only since the enlargement of the European Union but also in relation to specific markets like pre- and on-carriage of ferry services, large quantities of “non-cranable” semi-trailers are to be attracted to CT-services. In order to step into these markets, a team of BRAVO partners analysed the commercial, technical and operational possibilities of new technologies in this field. As a result of a system analysis, the “Innovativer Sattelanhängerumschlag” (ISU)-System scored best and RailCargo Austria decided to improve and develop the system further in order to demonstrate the technical feasibility. On May 16, 2007 the key components of the system were presented successfully in RCA’s terminal Wien Nordwest. The ISU-system is made of an auxiliary spreader

- ♦ Simple construction of additional handling equipment, which is retrofitable to any existing terminal
- ♦ No additional large scale infrastructure in the terminal
- ♦ Work processes in terminals comparable to existing workflow
- ➔ Integration into existing CT-processes

RailCargo Austria is committed to continue developing and implementing ISU in real operational conditions in the framework of the CREAM-Project

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Loading of non crunable semi-trailer with ISU

frame with gripping arms (target design) or ropes (prototype), a supporting beam for the king-pin and a wheel loading equipment as well as a loading ramp in the terminal. After the semi-trailers are placed on the ramp, the ISU beam and the wheel loading equipment is lifted by means of the spreader. The spreader can be mounted to a reach stacker or gantry crane with sufficient loading strength. Than the transshipment process is quite similar to the normal handling procedure despite the groundsmen who has to unlock the spreader manually.

The ISU-system’s key features and decisive advantages are:

- ♦ Use of conventional semi-trailers without specific CT-equipment
- ♦ Possible use of multiple common pocket wagon types with only minor adaptations
- ➔ Technology in the terminal not in the loading unit or wagon

Implementation of multifret wagon

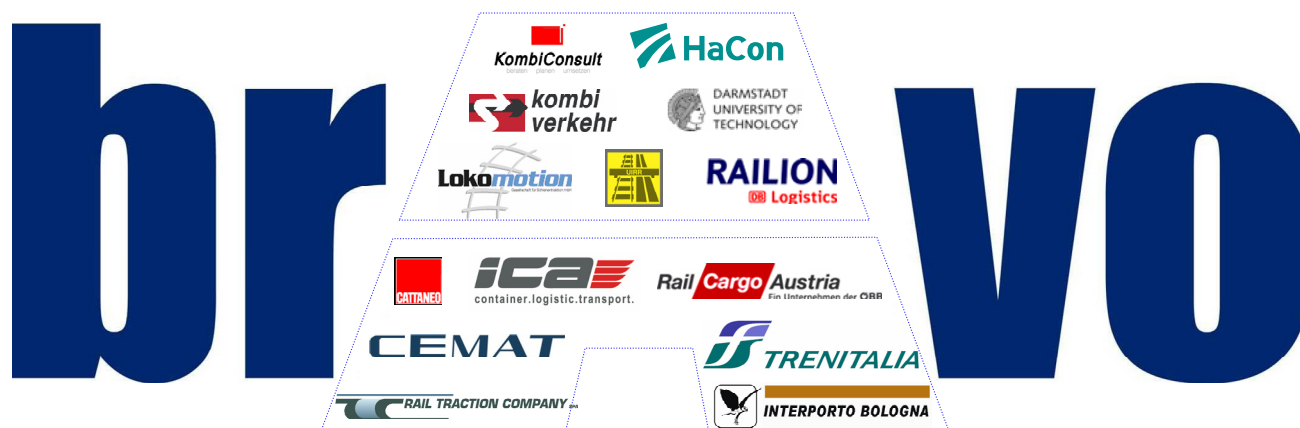
One of the obstacles in further developing CT in Italy is the traditional structure gauge of the rail infrastructure that allows only small loading profiles. CEMAT therefore investigated into implementation an own fleet of multifret wagons to facilitate pre- and on-carriage of international consignments also south of the GATEWAY terminals in Verona and Milano. The new type of wagon with a lower deck height allows to gain 23 coding points which practically means that containers and swap bodies can be 230 mm higher than on conventional wagon.



Loading of swap body on a CEMAT’s Multifret wagon

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Project consortium



The high-potential consortium unites both incumbent and independent railway undertakings – Rail Cargo Austria (RCA), Railion Deutschland, Trenitalia Cargo, Lokomotion, and Rail Traction Company (RTC) - the intermodal and terminal operators Cemat, Kombiverkehr, and Intercontainer Austria (ICA), and Interporto Bologna that is operating the freight village. In addition, the Swiss wagon manufacturer Ferriere Cattaneo contributes to technological innovations, while the UIRR, Brussels, is responsible a.o. for disseminating the project results. The logistics expert Prof. Hans-Christan Pfohl, who represents the Darmstadt University of Technology, is the scientific advisor to the BRAVO project.

The Frankfurt-based consultancy KombiConsult in cooperation with HaCon, Hannover, performs the project management. BRAVO has been selected by the European Commission, Directorate-General for Energy and Transport (DG TREN) to be funded under the 6th Framework Programme Research and Development since it develops a blueprint for seamless, interoperable rail and intermodal freight services due to be applicable to other European freight corridors.

The BRAVO-project which is supported by the European Commission and the Swiss Secretariat for Education and Research lasts from May 2004 to May 2007, but Rainer Mertel, Managing Director of KombiConsult GmbH, announced on the Consortium's behalf that joint activities for improving transport via Brenner will be continued in the "Brenner Improvement Group (BIG)" after the Project is finished. Therefore the operational use of the innovative components and their transferability will be further taken into account of by the Consortium Partners.

The acronym BRAVO stands for 'Brenner Rail Freight Action Strategy Aimed At Achieving A Sustainable Increase Of Intermodal Transport Volume by Enhancing Quality, Efficiency, and System Technologies'.



Conference participants

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