

# Freight Terminal at the Lahr Logistics Service Centre (Logistik-Leistungszentrum/LLZ Lahr)

Concluding Summary Report of 27 October 2014





**Project team**

Dr.-Ing. Ralf Chaumet  
Dipl.-Ing. Matthias Hofer  
Dr. Benjamin Buser  
Dr.-Ing. Alexander Dahl

Ernst Basler + Partner AG  
Mühlebachstrasse 11  
CH-8032 Zurich  
Switzerland  
Phone +41 44 395 16 16  
info@ebp.ch  
www.ebp.ch

Printed: 27 October 2014

Report No.: 212213

Document: 20141027\_ZusammenfassenderSchlussbericht\_Lahr\_final.docx

# Management Summary

CODE 24: Rotterdam – Genoa  
Corridor along the Rhine axis  
via Gotthard/Lötschberg

CODE 24 was approved as part of the strategic initiatives of the INTERREG IV-B NWE programme. Corridor 24 covers regions with very strong economic clout in the Netherlands, Germany, Switzerland and Italy with a catchment area of some 70 million people. This freight corridor connects the North Sea port of Rotterdam with the Mediterranean port of Genoa and corresponds to the EU TEN-T Core Network's Rhine-Alpine Corridor.

Importance of this corridor in  
rail transport

The future completion of the Gotthard Base Tunnel in 2017 and the completion of the Lötschberg Base Tunnel in 2007 present new transport challenges: together with the rail infrastructure measures along the entire corridor already adopted and under construction, possibilities have to be created to eliminate bottlenecks for loading goods from road to rail. The region around the Ortenau District plays a key role in this, as there are no efficient transshipment facilities for rail-road transport between Karlsruhe and Basel.

Routing alternatives in the  
Offenburg – Freiburg region

The current expansion plans provide for the addition of two tracks along the existing rail line between Offenburg and Kenzingen. As an alternative to this, many stakeholders are calling for a rail line along the A5 motorway reserved for freight traffic, with the existing line being used solely for passenger transport in the future. This routing would enable the construction of a transshipment terminal for combined transport in the area of the erstwhile military airport in addition to the ongoing development there of a business park. For various reasons a terminal like this can only be efficiently developed in conjunction with such a routing.

Freight terminal in the Lahr  
Logistics Service Centre

Given the local circumstances, such a terminal can be designed for 750-metre long trains of unaccompanied combined transport and a "rolling highway" (loading of lorries in the Alpine transit through Switzerland). Another advantage is that these 750-metre trains can be parked in a marshalling yard, without intermediate processing, and afterwards filter smoothly onto freight tracks directly alongside. This directly enables cost-efficient, timely access to a continuous main line. As the motorway accesses are in the immediate vicinity of such a freight terminal, this allows rapid accessibility for lorries without them having to cross residential areas. With additional traffic management measures, further improvements can be easily achieved beyond the situation existing today by the conveniently located development of such a freight terminal.

Freight volume

Freight terminals are often developed in stages: as a target of total potential, about 1.1 million tons a year can be expected in unaccompanied transport from 2025 in north and south traffic direction. It is also possible to design the facility in such a way that it effectively supports the Swiss modal shift policy, and 160,000 lorries in a trend scenario or up to 450,000 lorries in a maximum scenario can be shifted on to rail. This forecast of potential should be realised expediently in stages.

Regional economic effects

A positive impact on gross value creation can be expected from the active components of a freight terminal at the Lahr Logistics Service Centre. This consists of:

- The direct operation of a freight terminal
- Transport cost savings resulting from an economically advantageous involvement in combined transport
- Location effects in the area of the Startk(L)ahr Airport Business Park
- Location effects in the Ortenau District

The effects will be felt beyond the Ortenau District, with a calculable positive overall effect of approx. 45 million euros a year for the entire region.

Combined transport:  
elimination of road haulage

Reducing road haulage leads to lower CO<sub>2</sub> emissions: depending on the assumptions behind the forecast, these cuts amount to between 90,000 and 185,000 tons of CO<sub>2</sub> a year. These figures show that there is potential for a modal shift to environmentally friendly means of transport (rail) in a region with a large volume of freight like the Ortenau District and surrounding areas.

Assessment of the requirements  
under planning legislation

The convenient location in terms of transport is coupled with the smallest possible adverse impact on and lowest possible noise emissions to be expected in the neighbouring municipalities; that makes the facility fundamentally feasible under planning law as things stand.

## Table of contents

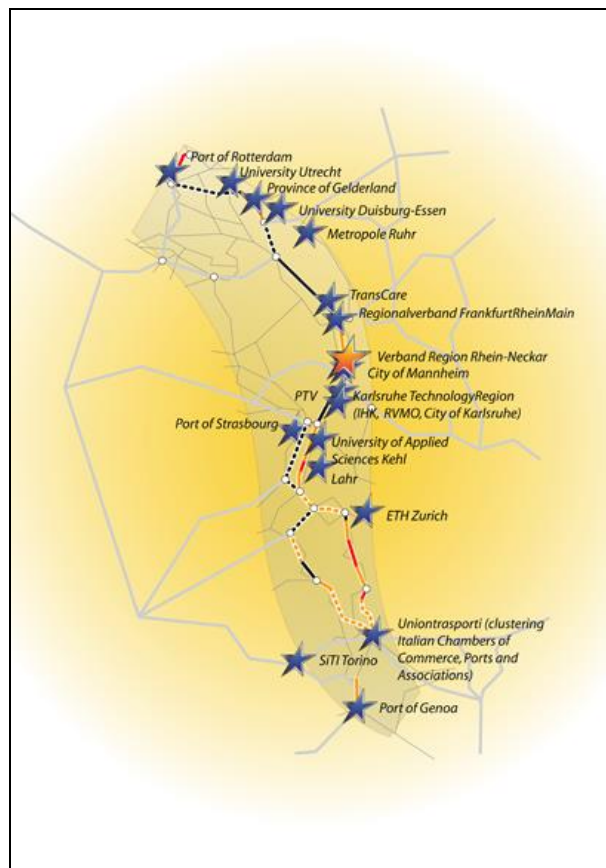
Management Summary.....	1
1 Starting situation.....	I
2 Analysis of potential.....	IV
3 Technical feasibility .....	VIII
4 Regional economic effects .....	XI
5 Operator model: possible procedure .....	XIV
6 Aspects of traffic management for road haulage.....	XVI

# 1 Starting situation

Starting situation  
Code 24

CODE 24 was approved as part of the strategic initiatives of the INTERREG IV-B NWE programme. Corridor 24 covers several European regions with very strong economic clout and crosses the Netherlands, Germany, Switzerland and Italy, connecting the North Sea port of Rotterdam with the Mediterranean port of Genoa. Some 70 million people live in this catchment area and 50% (700 million tons a year) of the north-south freight is transported by rail.

Figure 1: CODE 24 corridor



Source: [www.code-24.eu](http://www.code-24.eu)

Importance of Corridor 24

The forthcoming opening of the second railway Alpine Base Tunnel in 2017 at Gotthard and the ongoing expansion of the feeder lines will further increase the corridor's importance. The Upper Rhine region, which includes the Ortenau District, is a key hub in this trans-European transport axis, with all three elements of the trans-European networks crossing it.

Access to combined transport

As there is no direct access to the north-south rail freight line in the area between Karlsruhe and Basel for combined transport, the question is whether a terminal for combined transport could be built in the Lahr area in addition to the development of a business park on the land of



Current situation in relation to  
the rolling highway

the former military airport at Lahr, and whether its catchment area has sufficient freight potential for such a terminal.

Freight terminal = combined  
transport & rolling highway

There are only restricted loading facilities for the current rolling highway in the urban area of Freiburg im Breisgau. We studied whether loading facilities with greater capacity than the transshipment facilities in Freiburg (south) could be created. This would effectively support Switzerland's modal shift aims for trans-Alpine transport by moving the transshipment of the rolling highway away from Freiburg.

Such a terminal with loading facilities for the rolling highway and transshipment facilities for combined transport is referred to below as the freight terminal.

EU corridors

Two of the EU "TEN-T Core Network" corridors cross the Upper Rhine rift valley running north-south (cf. Figure 2):

- The Rotterdam – Genoa (RHINE-ALPINE) axis under discussion here and
- An axis branching off the corridor Glasgow – London – Brussels – Lyon – Marseille via Metz – Strasbourg (NORTH SEA – MEDITERRANEAN)

Figure 2:  
Segment of the TRANS-  
EUROPEAN TRANSPORT  
NETWORK TEN-T CORE  
NETWORK CORRIDORS

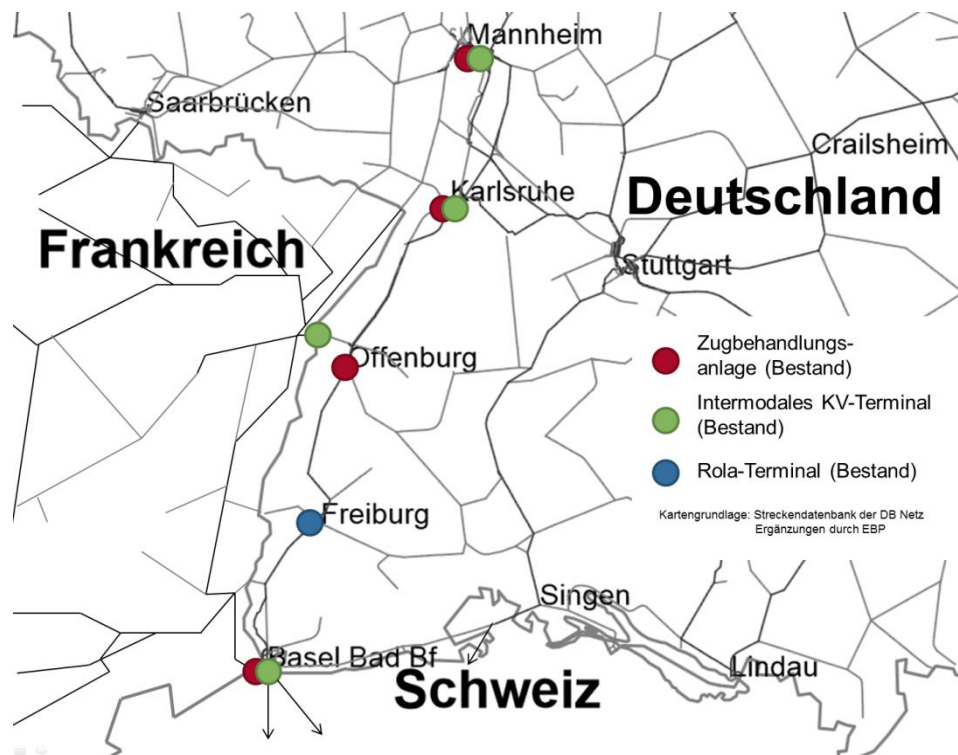




The TEN-T corridors “Atlantic” and “Rhine – Danube” with their west-east transport flows also cross near a possible freight terminal in Lahr, meaning additional potential for development. This was not looked at in more detail under CODE 24 because of the focusing on the north-south routes of the CODE 24 corridor (c.f. Figure 1).

As the technical requirements in rail transport of the corridor crossing Belgium and France are totally different from those of the rail network on the German side, the terminal situation shown in the following overview (cf. Figure 3) is limited to the German side of the Upper Rhine rift valley (including Basel).

Figure 3:  
Overview of the terminal  
situation in the Upper Rhine  
region



## 2 Analysis of potential

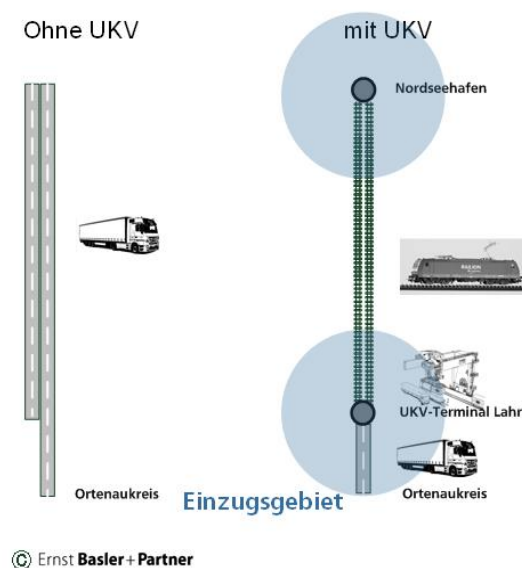
Analysis of potential: sufficient volume to be expected

The aim of combined transport as unaccompanied combined transport is to shift road haulage over long distances in an environmentally friendly way to rail. Here one differentiates between:

- Unaccompanied combined transport (UCT) and
- Accompanied combined transport, also known as "rolling highway".

Both forms of combined transport require a rail transport ↔ road haulage transshipment terminal for the transport containers and so create a transport chain. Figure 4 compares these transport chains – road only, without UCT, road-rail with UCT – taking the example of road haulage with the Ortenau District.

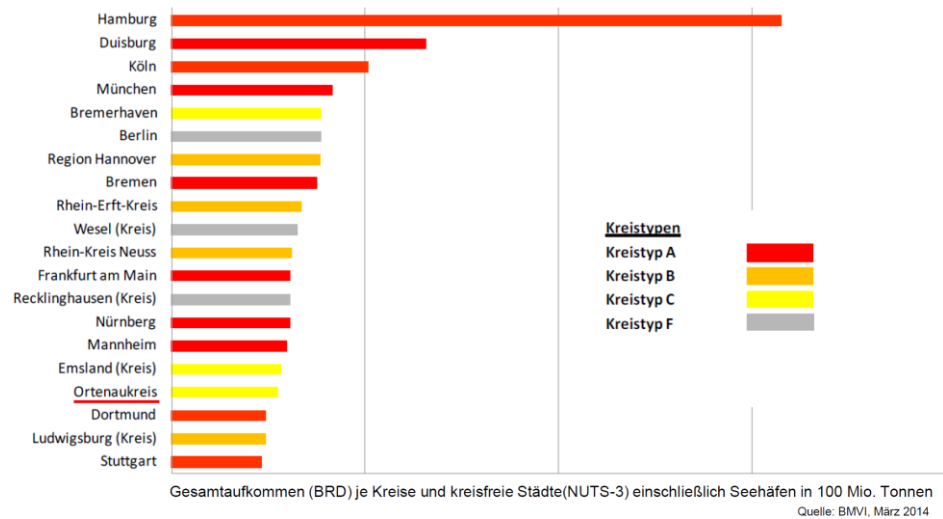
Figure 4:  
Transport chain with/without  
unaccompanied combined  
transport (UCT)



The Ortenau District with its high volume of freight on the road (about 34 million tons in 2007) is in second place of all rural districts outside of an agglomeration nationwide, measured by its volume.

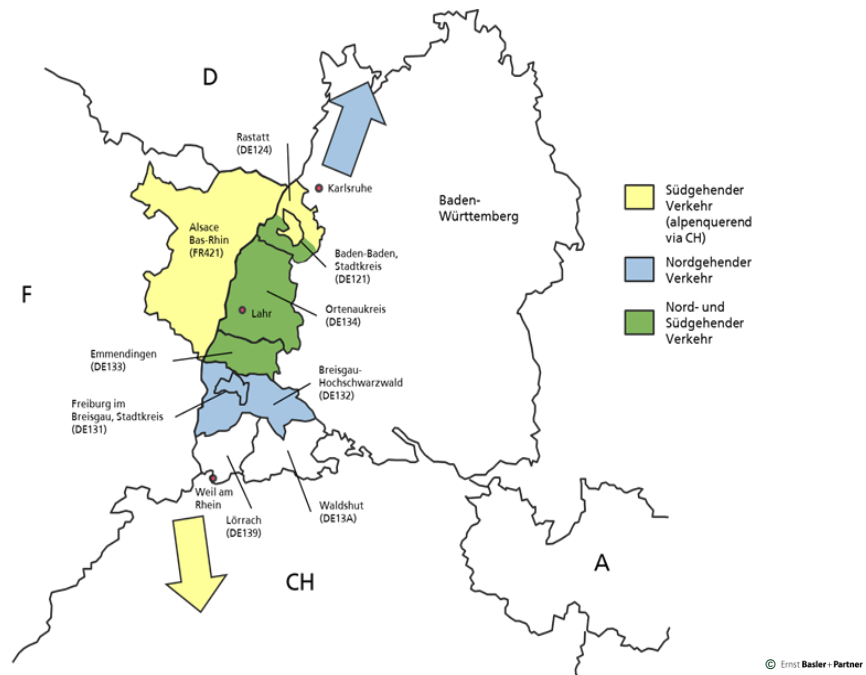
Since the Ortenau District as a rural district outside of a metropolitan region has different structural conditions from agglomerations, under present conditions the future development of volume without a freight terminal would be almost completely on the road.

Figure 5:  
Total volume per district and  
independent town (NUTS 3)  
including seaports in 100  
million tons



Taking into consideration usual transport distances in UCT of more than 350 km and types of goods particularly suitable for this (no bulk transport, no building materials), with a 40% potential growth in combined transport from 2007 to 2025 almost 1 million tons of freight (dispatch and reception) can be expected for northbound traffic. The potential forecast for southbound traffic for 2025 is 0.2 million tons of freight in each direction; this includes current observations of the impact of general transport conditions in Switzerland on today's modal split of comparable trans-Alpine freight transport through Switzerland. This potential is regarded as original volume in the catchment area (cf. Figure 6) of a freight terminal in the Lahr Logistics Service Centre.

Figure 6:  
Catchment areas (based on districts) from the viewpoint of lorry transport for a UCT terminal



Rolling highway: accompanied  
combined transport

Transit traffic through Switzerland – in addition to unaccompanied combined transport (UCT) – is now also transported on the rolling highway from Freiburg South as accompanied combined transport. According to an evaluation of statistical data on the sources and destinations of the lorries transported on the rolling highway, this is long-distance road haulage traffic. The rolling highway provides drivers with rest time in the couchette car on board, whilst the lorries are transported by rail through Switzerland. This type of transport on the rolling highway seems to be of less interest for the catchment area, as shown by the current, relatively low use (at present about 2% of the current rolling highway volumes). In our consideration of the potential we assume that this situation will not change substantially, and the percentage of rolling highway volume will remain at its current level.

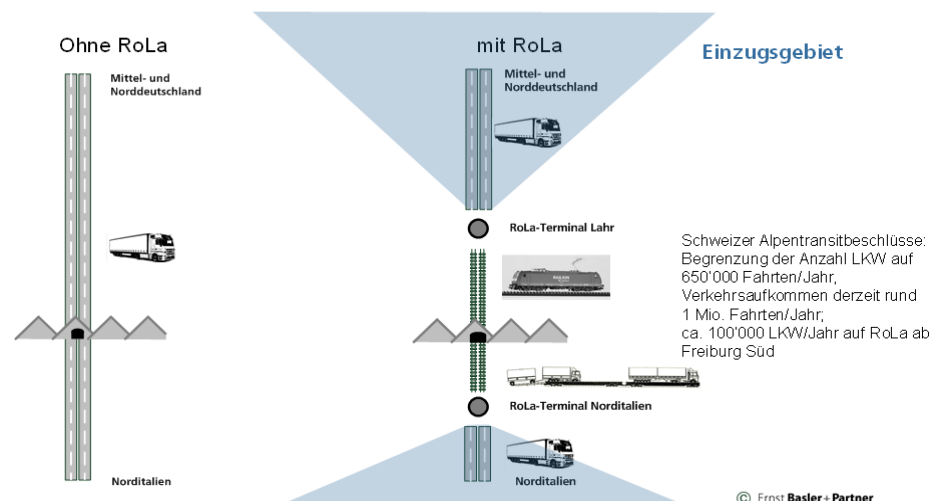
Rolling highway scenarios

In order to consider a range of possible transport developments on the rolling highway, we have worked with scenarios; depending on the modal shift scenario one can reckon on a volume

- of approx. 160,000 lorries to be shifted to rail in 2025 with an average expected growth of the rolling highway up to
- a maximum scenario of up to 450,000 lorries to be shifted to rail.

This forecast of the development in volume is heavily contingent on Switzerland's transport policy; yet the trend scenario alone signifies a 60% growth in piggybacked lorries compared to today's level.

Figure 7: Transport chain  
with/without rolling highway



Environmental impact of  
shifting transport to rail

If long-distance road haulage traffic is shifted to rail using a freight terminal in Lahr, there will be reductions in lorry mileage with the following reductions in environmental impact due to CO<sub>2</sub> emissions:

- In UCT: a reduction of up to 56 million lorry km a year, cutting environmental impact by up to 40,000 t CO<sub>2</sub> emissions

- For a rolling highway: depending on the shift scenario, 70 to 200 million lorry km a year, equating to a cut in CO<sub>2</sub> emissions of 50,000 to 145,000 t a year.

This is based on average lorry capacity utilisation.

### 3 Technical feasibility

Technical feasibility:  
given with freight line alongside  
the motorway

The precondition for the implementation of a freight terminal is that the new third and fourth tracks planned are routed alongside the motorway. With the aid of a short siding it is possible to link up a freight terminal in such a way that trains from north and south can drive into this terminal. The surface required for this was calculated as roughly 20 hectares. Figure 8 illustrates the basic options and requirements.

Figure 8:  
Area of possible terminal sites



Map source: www.google.de

- Area of possible sites
  - Facility about 2 km long recommended and feasible
- Functions/terminal areas by modules
  - Combined freight transport
  - Rolling highway
  - Marshalling yard: entrance and exit tracks
- Traffic connection
  - Line alongside motorway (Lahr terminal = added benefit)
  - Lorries do not drive through any residential areas
  - Motorway connections: full expansion / construction
- Land required for transshipment area
  - Up to 20 hectares for UCT and rolling highway

Layout options

A large number of possible layouts and configurations were studied in the area of possible terminal locations. A layout to the west directly alongside the site of the former military airport emerged as feasible, also from noise abatement aspects. As the Regional Association's land is zoned for industrial development, layouts of a freight terminal east of the feeder road ("Panzerstraße") were excluded from further considerations.

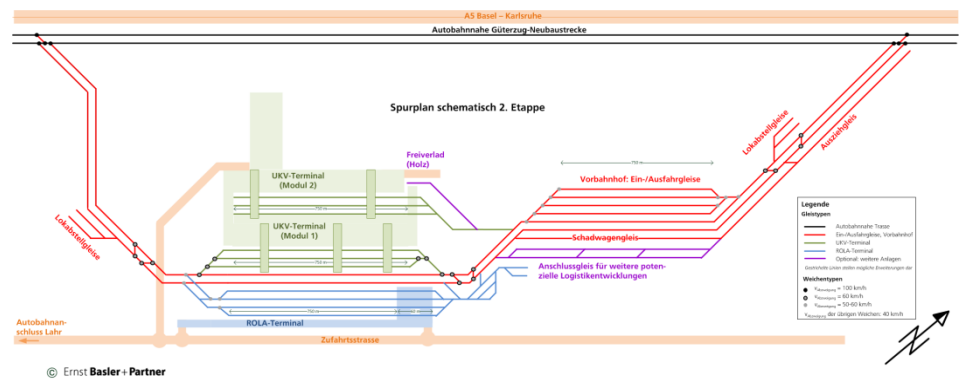
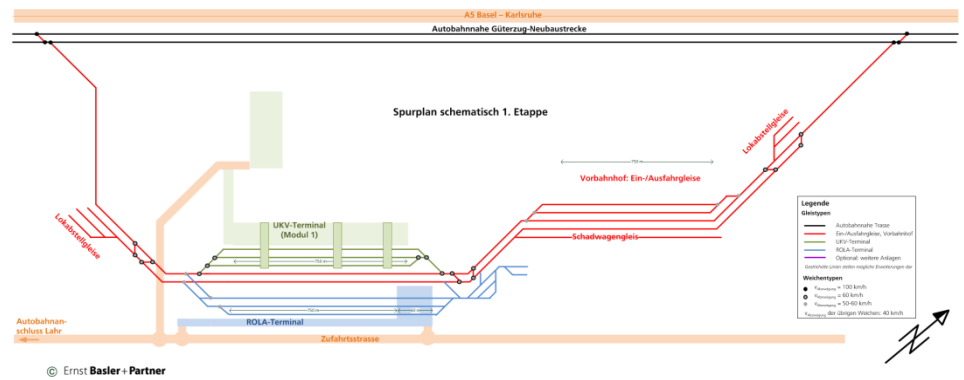
The following aspects make this facility special:

- Two modules functionally separated from each other are possible for the rail-road transshipment:
  - UCT transshipment facility with the aid of gantry cranes
  - Rolling highway loading facility for lorries, which drive automatically on to railway wagons
- These facilities can be combined with a marshalling yard (which can also be used for freight train passing manoeuvres) in such a way that, although functionally separated, they produce a multimodal freight terminal.
- Because of the spatial extension the UCT facility can be planned for 750-metre long combined transport trains.
- UCT liner trains are possible, i.e. the UCT trains can roll in a northerly and southerly direction into the facility directly with the mainline locomotive and, after a relatively short period of stay, drive out again with the mainline locomotive. This enables high-quality, rapid transshipment.
- The facility can be built in stages, depending on the intended degree of expansion, without having to lose basic functionalities.
- The lowest possible impact is expected for the environment, and noise emissions in the neighbouring municipalities will be below the admissible limits; that makes the facility fundamentally feasible under planning law as things stand.

Figure 9 shows a possible terminal layout suitable for handling unaccompanied combined transport (transshipment using gantry cranes) and accompanied combined transport (rolling highway; lorries drive under their own steam onto railway wagons) in line with the forecasts of potential. It can likewise be seen from the figure that the functional separation enables implementation in stages or a partial realisation of the facility by modules.



Figure 9:  
Schematic track plans for Lahr  
Freight Terminal  
Above: stage 1 – launch option  
Below: addition of a stage 2



## 4 Regional economic effects

Regional economic effects:  
region is the main beneficiary

The following aspects were studied:

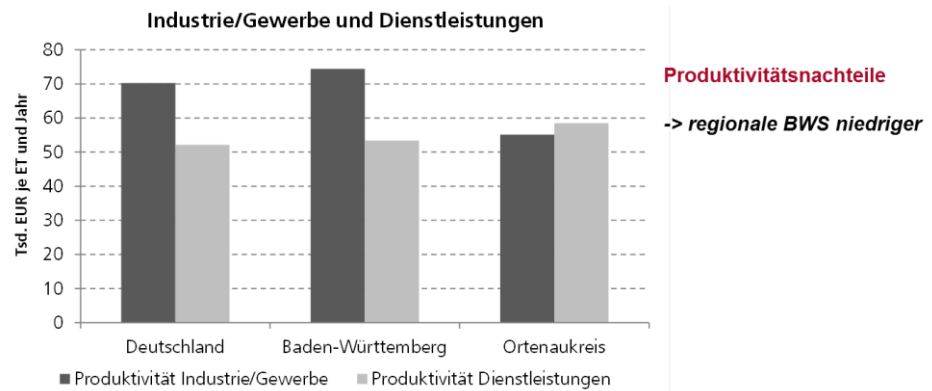
- What regional economic effects are expected for the Ortenau District from a Lahr freight terminal?
- How large are the regional economic effects in relation to the gross value creation of the Ortenau District?

These regional economic effects of a freight terminal in Lahr – which necessitates a freight rail line (3<sup>rd</sup> and 4<sup>th</sup> track) alongside the motorway – are created when new infrastructure is built and put into operation. This Lahr freight terminal enables the transport industry of the Ortenau District to participate in the pan-European context in combined transport and to develop transport rationalisation potential.

Ortenau District: relatively low  
productivity

Figure 10 shows the lower productivity of Ortenau District trade and industry compared to Germany and Baden-Württemberg; this results in the regional gross value creation also being lower.

Figure 10: Productivity by  
worker and year for  
industry/trade and services for  
2011 for Germany, Baden-  
Württemberg and the Ortenau  
District



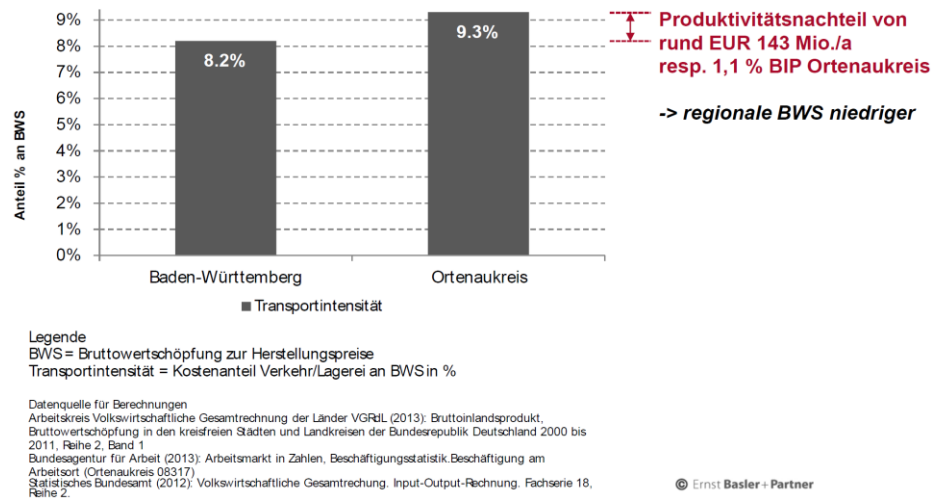
### Legende

ET = Erwerbstätige, alle Personen die innerhalb einer Raumeinheit einer oder mehreren Erwerbstätigkeiten nachgehen  
BWS = Bruttowertschöpfung zu Herstellungspreisen; Produktivität = BWS/ET, Ergebnis in Tsd. EUR pro ET

© Ernst Basler + Partner

The explanation for this is that, as illustrated in Figure 11, the proportion of gross value added expended on transport is relatively higher in the Ortenau District than in Baden-Württemberg. Access by means of a freight terminal and an efficient link-up with the main lines of combined transport can help here to a certain extent.

Figure 11: Aggregate transport intensity of Baden-Württemberg and Ortenau District according to percentage share of transport costs in GDP



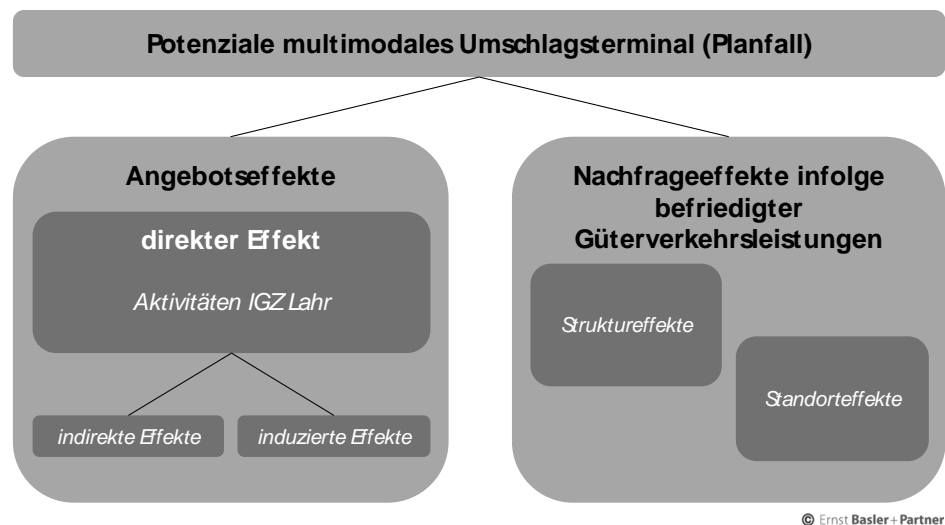
Considered effects of a freight terminal

Should a Lahr freight terminal go ahead (planned state), its active components encompass both supply effects and demand effects for freight services. This is shown in Figure 12 below. When one works out the impact on gross value creation by active components in a regional economy analysis, one sees that they can be subdivided in the following factors:

- Direct operation of a freight terminal at LLZ Lahr
- Transport cost savings resulting from an economically favourable participation in combined transport
- Location effects in the area of the startk(L)ahr Airport Business Park
- Location effects in the Ortenau District

The figure below illustrates these effects, with a total effect of about 45 million euros a year being expected.

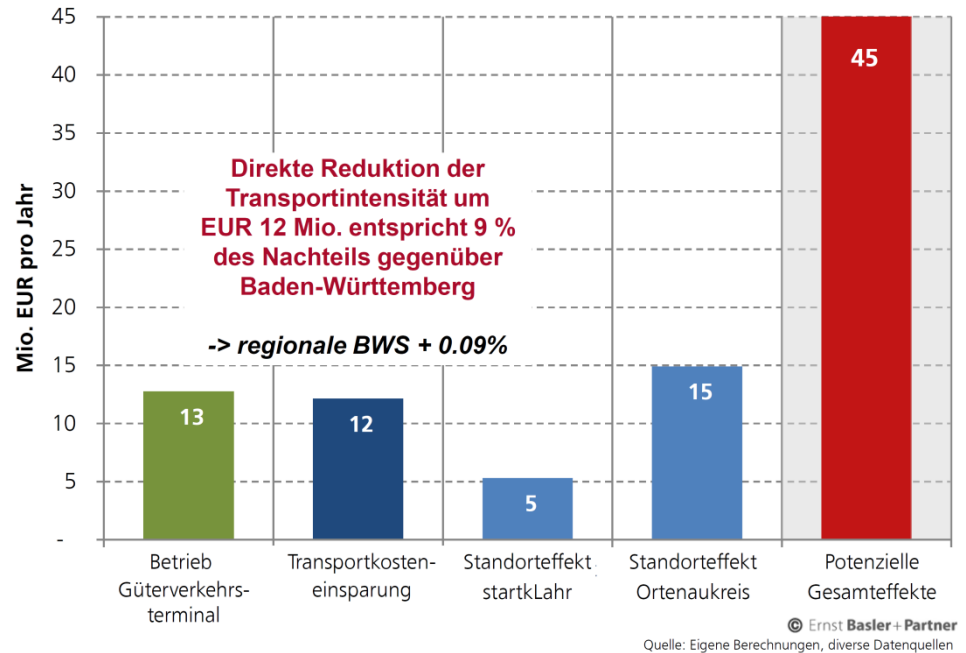
Figure 12: Methodology of the study of the regional economic potential



This figure equates to roughly 0.35% of the current gross domestic product of the Ortenau District, meaning that a freight terminal can reduce the disadvantage in productivity ascertained in the comparison

with Baden-Württemberg by approx. 10 % (cf. Figure 13). This creates new jobs.

Figure 13: Calculated overall effects on regional gross value creation with the various active components on the supply and demand side



Other positive effects are:

- Trade and industry space throughout the Ortenau District becomes more attractive
- An increase in regional competitiveness
- Retention of the function as top region in freight transport by relieving the strain caused by growth in road haulage

A key requirement for such effects to be achieved is for the freight terminal to have high-quality facilities and a good capacity.

Additional potential for traffic of the TEN-T corridors "Atlantic" and "Rhine – Danube"

The location on the crossing point of the east-west-oriented axes can create not only synergy potential but also additional effects, especially for eastbound transport. We recommend adding this aspect to the CODE 24 programme in a future project development.

## 5 Operator model: possible procedure

Starting situation in relation to the requisite acquisition of land

In principle the methodology for further procedure – after a decision to build the third and fourth track of the Rhine Valley Railway alongside the motorway – can be outlined as follows in accordance with the current starting point:

- Define the line layout and planned completion and start-up times
- Satisfy the conditions of planning law
- Secure the requisite land by integrating the provision of land relating to the Regional Association's business park to be developed; acquire land
- Define an owner strategy (public or private or public/private mixed) by making the land available for a freight terminal, integrally linked with the development of the startk(L)ahr business park
- Search for interested parties among potential operators of freight terminals (combined transport companies, port operators, state companies etc.) in an open, transparent process

As with the layout of the facility, its operating concept can be broken down into modules:

- The unaccompanied combined transport terminal can be operated as an independent facility from a functional and operator point of view
- The rolling highway facility can be operated as another independent module separately from that of unaccompanied combined transport.

Parties interested in operating the respective modules can include, for instance, the established operators of combined transport facilities or regionally based companies already operating in the segment. Consideration can also be given to consortia of logistical service providers or individual logistical service providers expecting from such a terminal a possible concentration of freight flows of high-volume proportions. This solution would represent a strong regional anchoring.

On the other hand, the operation of the rolling highway facility will be regarded as a special market for which priority will be given to companies operating in this segment according to current information.

Aspects of operator models

In accordance with the new starting situation arising after the acquisition of the pieces of land, the next steps are as follows:

- Clarify the landowners' strategy and the modalities for operating the terminal on their properties
- Develop financing models, perhaps private-public partnership models, too

- Adjust or improve the layout in line with the operator requirements to be specified, schedule in stages etc. on the basis of the search for operators conducted beforehand and of the expected location of the rail line alongside the motorway
- To be done by the operator of the terminal: organise the financing in line with the provisions applicable at the time of implementation

The actual implementation phases can only be initiated once there is a decision on the routing variant alongside the motorway, and its location is well enough known that the exact connection points of such a freight terminal can be co-ordinated with the planning of the line alongside the motorway.

Question of the transshipment technology to be used

The transshipment technology to be used cannot be decided on until the beginning of the project planning phase with the co-operation of or as specified by a terminal operator. What should be taken into account, however, is that terminal facilities can be highly viable for the future if standard rolling stock with a high distribution rate can be operated efficiently (with low operating costs) among different rail companies.

Incorporating the logistical potential of LLZ Lahr

Freight terminals benefit from land reserves in the immediate vicinity for additional logistical services; these can be, for instance:

- Facilities for empty container management (e.g. storage)
- Track capacities for parking wagons
- Integrating maintenance facilities (e.g. sheds) in logistical processes

This is possible if a freight terminal is integrated in the LLZ Lahr because of the land reserves. Additional uses (e.g. timber loading) can be established in the area of the marshalling yard.

## 6 Aspects of traffic management for road haulage

Methodology of transport development: proximity to motorway important

Given the transport distances, the methodology of transport development is as follows:

- Rolling highway: this is long-distance road haulage shifted to rail in Switzerland as trans-Alpine traffic; the vast majority of this traffic is transit traffic through the Ortenau District, too. This transport is already handled on the A5 motorway and can be routed directly into the freight terminal via the Lahr motorway slip road.
- Unaccompanied combined transport: this has different sources in the catchment area and is already operating as long-distance road haulage via the motorway. The freight terminal enables transport containers from lorries now driving past on the motorway to be transhipped to rail next to the slip road. Because of the location of the freight terminal, access to the motorway slip road/freight terminal remains the same in principle.

Aspects of traffic management for road haulage

A possible future freight terminal will have ideal conditions for direct motorway access in road transport:

- There is direct access to the A5 motorway running north-south. In addition the Lahr junction is also to be extended (full expansion).
- Even if there are currently no concrete plans for a Lahr-Nord/Friesenheim junction, another direct entrance option from the A5 on to the slip road to the freight terminal could be an interesting option and a reason to reassess the transport situation for road haulage in Lahr itself in general.

In this context reference should also be made to a possible link-up of the B33 and A5 motorways south of Offenburg, as this likewise improves accessibility to the motorway.

Current road haulage volume

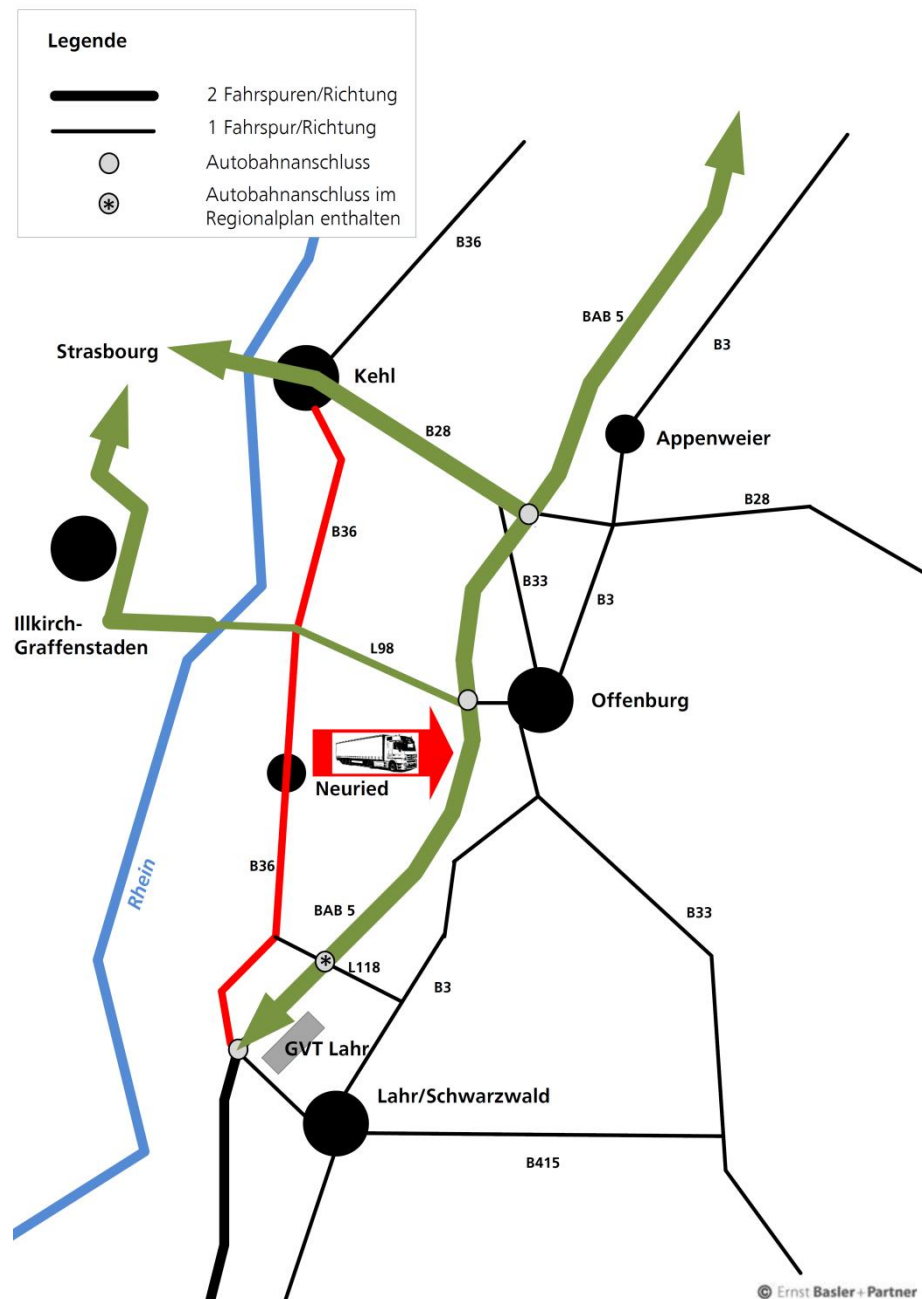
To shift road haulage from federal highways to the motorway we recommend incorporating the following aspects in future considerations:

- Where road haulage already represents a problem today, traffic-limiting measures/traffic regulations should be studied for the current status quo; this is independent of a freight terminal at Lahr.
- In future, tolls are also to be levied on federal highways, reducing the cost benefit over the (faster) connections via the motorway.
- With a Lahr North/Friesenheim junction, in addition to the B33 south junction road haulage coming from Offenburg can be intercepted and directly – bypassing the town of Lahr – channelled into the area of the possible freight terminal and the current business park.



For that reason, regardless of whether a freight terminal goes ahead at Lahr, we recommend recording the current road haulage volume and if necessary stipulating traffic regulations. Figure 14 illustrates the proposed regional transport development concept in conjunction with a freight terminal.

Figure 14:  
Regional transport  
development concept



Examining possibilities of traffic management

Under certain conditions, traffic regulations for limiting traffic flow can be passed.<sup>1)</sup> These conditions are met, for instance, if a major impact is expected in the form of substantial increases in noise due to toll-avoiding through-traffic in towns and municipalities. Under recent rulings, a further increase in noise pollution above the existing level of 70 dB (A) in the daytime or 60 dB (A) at night is regarded as a substantial increase in noise.<sup>2)</sup> Furthermore, a decision has to be taken in this consideration process as to whether a restriction of or a ban on traffic is appropriate and proportionate, taking into account the function of the road and other concerns such as the environment, the economy and road safety. We recommend conducting exploratory talks with the institutions concerned at an early stage. To minimise any divergences, measures ought to be designed in such a way that they result in practically no negative consequences for local businesses.

Proposals for effective measures

As shown in Figure 15, examples of traffic regulation measures that have proven effective with regard to road haulage are as follows:

- Restrictions on through traffic speeds, e.g. to 30 km/h
- Transit restrictions for lorries over a stipulated permissible total weight (e.g. 12 t), perhaps varying with the time of day or at night-time

As these measures are contingent on the total lorry volume on the surrounding road network, this should be considered now already if needs be to reduce the road haulage impact. There also has to be a guarantee that these restrictions are enforced by checks.

Road planning additionally required


In addition, expedient road planning likewise counters general lorry through-traffic.

---

1) cf. Highway Code (StVO), section 45, para. 9 and decree issued by the Baden-Württemberg Ministry of the Interior on 17 January 2006

2) cf. Judgment of the Federal Administrative Court of 15.12.2011 and Sixteenth Ordinance on the Implementation of the Federal Emission Control Act (Traffic Noise Ordinance – 16<sup>th</sup> BImSchV) of 19 September 2006

Figure 15:  
Examples of traffic regulation  
procedures and options

Traffic regulation procedures and options		
Possible measures	Maximum permissible speed	Transit restriction
Explanation	Restriction of maximum permissible speed to 30 km/h	Transit restriction on lorry through-traffic from 12 t permissible maximum weight
Signs	Signs  274-53	Sign 253 with additional signs 1053-38 and "12t"
Sanction <sup>3)</sup>	Depending on the severity of the offence, a fine of up to € 680, 4 demerit points and a 3-month driving ban	Flat sum of € 75

3) cf. Ordinance on the Issuance of a Warning, Scales of Financial Penalties, and the Issuance of a Driving Ban for Traffic Offences (Catalogue of Fines Ordinance - BKatV), no information on transit restrictions and repeat offenders available from the Federal Office for Goods Transport or police stations