BARTLETT SCHOOL OF PLANNING

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# PROJECT PROFILE

# Germany

# Federal Motorway A 20

# *Bundesautobahn A 20*

omega centre

**Centre for Mega Projects in Transport and Development**

A global Centre of Excellence in Future Urban Transport
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This report was compiled by the German OMEGA Team, Free University Berlin, Berlin, Germany.

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# A PROJECT INTRODUCTION

## Type of project

Project name

Official project name: German Unity Transport Project 10 (*Verkehrsprojekt Deutsche Einheit 10 (VDE 10)*.

Official road name: Federal motorway 20 (*Bundesautobahn 20*, short form *Autobahn 20*, abbreviated as *BAB 20* or *A 20*).

Unofficial name: Baltic Sea motorway (*Ostseeautobahn*).

Description of mode type

Road (motorway).

Technical specification

Intersection-free.

Dual two lane motorway including hard shoulders.

Cross-section: 29.5m (Lübeck-Rostock); 27m (Rostock – A11).

Principal transport nodes

The project links the hinterland of the Baltic Sea Coast of Mecklenburg-Western Pommerania, Poland, and Northeastern Brandenburg to the western German and European motorway network. Major nodes and links are (from west to east):

- City of Lübeck
- Interchange to motorway A 1
- City of Wismar
- Interchange to motorway A 14
- City of Rostock
- Interchange to motorway A 19
- City of Stralsund
- Interchange to federal highway B 96 n (to the Island of Rügen)
- Interchange to motorway A 11

Major associated developments

*B 96 n Connection Stralsund / Rügen (B 96 n Zubringer Stralsund / Rügen)*

To connect the city of Stralsund and the island of Rügen (962km²) to the federal motorway A 20, a new federal highway (*Bundesstraße*) B 96 n was constructed or is in the planning process. The core of this 53.8km development is the 4.7km crossing of the Strelasund, a sound, which separates Rügen from the German mainland.

*North-West bypass of Hamburg (Nordwestumfahrung Hamburg):*

In Schleswig-Holstein the BAB 20 will be continued further westbound and will circle the city of Hamburg to the north and west. Two main aims should be achieved with this new

construction: the hinterland connection of the German seaports and further development of transportation infrastructure for the enlargement of the European Union (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2003). The BAB 20 has major importance for the entire north of Germany and is an important cornerstone for the Trans European Road Network (TERN) (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 39) as defined by the European Union.

Parent projects

*The German Unity Transport Projects (Verkehrsprojekte Deutsche Einheit, VDE)*

"The German Unity Transport Projects (*Verkehrsprojekte Deutsche Einheit, VDE*) were enacted by the Federal Government in 1991. The 17 German Unity Transport Projects form the backbone of efficient and modern transport links between the old and new Federal states. They comprise nine rail and seven motorway projects plus one waterway project. The programme, which involves funding totaling just under EUR 38.5bn, was launched in 1991 to help the Federal states in Eastern and Western Germany grow together more quickly. The decades of division had left a legacy of sizeable gaps in the transport infrastructure." (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2009a [online])

**Figure 1: A 20 near Langsdorf.**

(Source: Darkone, 2004 [online])

## Country/Location

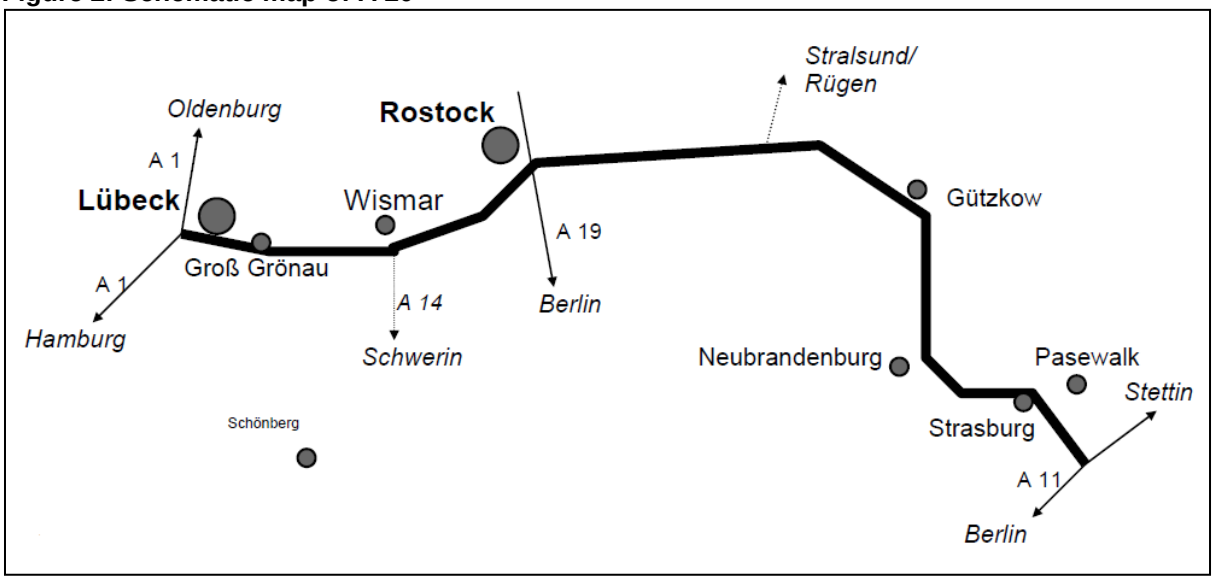
Main project: German Unity Transport Project 10 *(Verkehrsprojekt Deutsche Einheit 10 (VDE 10))*

Total length: 323.2km.

The motorway is located in three Federal states. Of the total 323km, 17km are located in Schleswig-Holstein, 280km in Mecklenburg-Western Pommerania, and 27km in Brandenburg.

The BAB 20 is the longest newly built motorway in the history of the Federal Republic of Germany. It runs along the coast of the Baltic Sea from the interchange with federal motorway A 1 near the city of Lübeck mainly eastbound until the interconnection to Stralsund and Rügen. From there it runs mainly southeast to the interchange with federal motorway A 11.

**Figure 2: Schematic map of A 20**




(Source: Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2008a, p. 18)

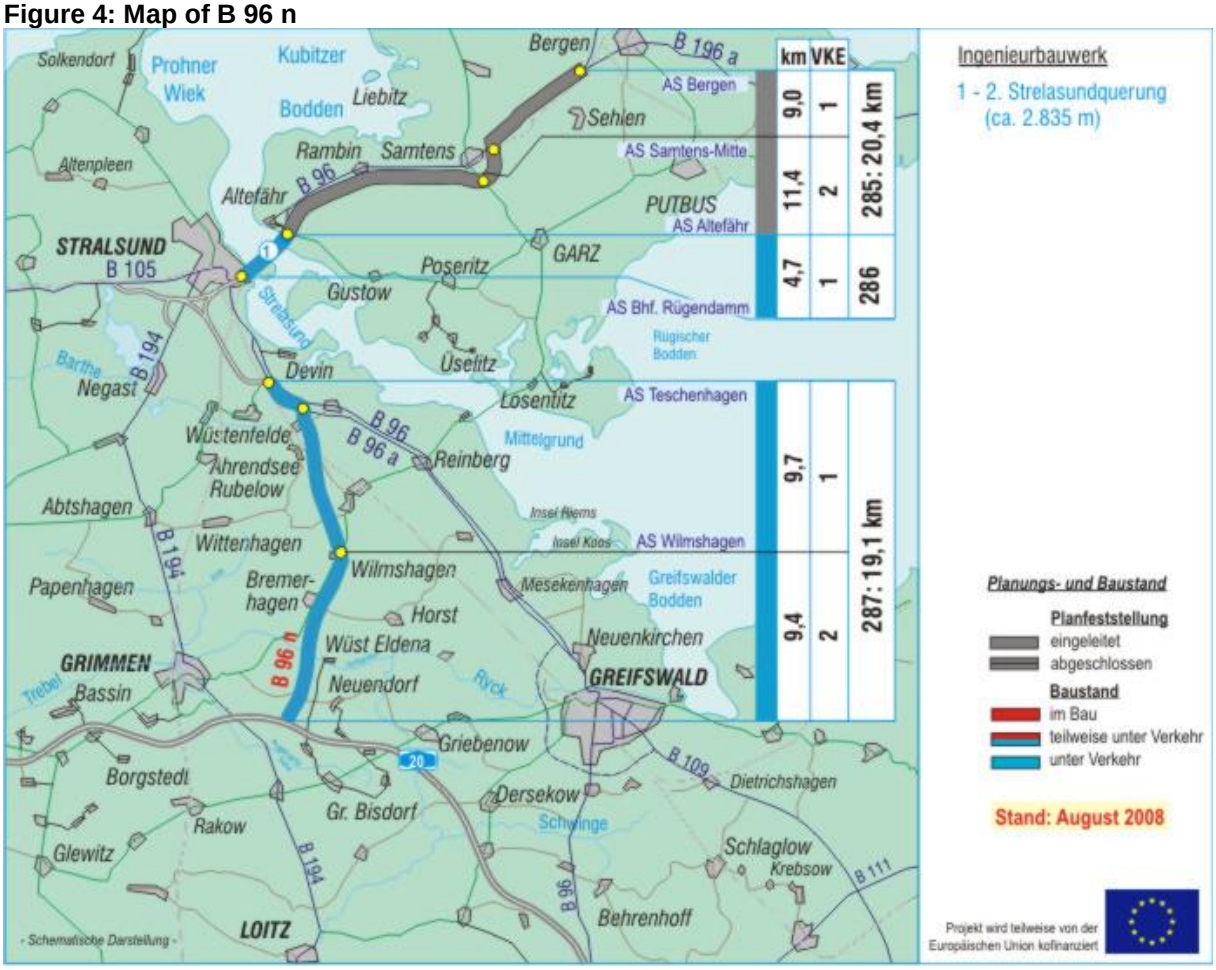
**Figure 3: Map of A 20 route**


(Source: Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2008b [online])

Major associated development: B 96 n connection Stralsund / Rügen (*B 96 n Zubringer Stralsund / Rügen*)

The new federal highway runs from the motorway-interchange (AS Stralsund) northbound through the city of Stralsund, followed by the 4.7km crossing of the Strelasund. After reaching the island of Rügen another 20.5km of the newly constructed federal highway should reach the city of Bergen, which can be characterised as the major city on the island as well as the major traffic node. The whole project is located in the Federal State of Mecklenburg-Western Pommerania. (DEGES 2007b)

**Figure 4: Map of B 96 n**

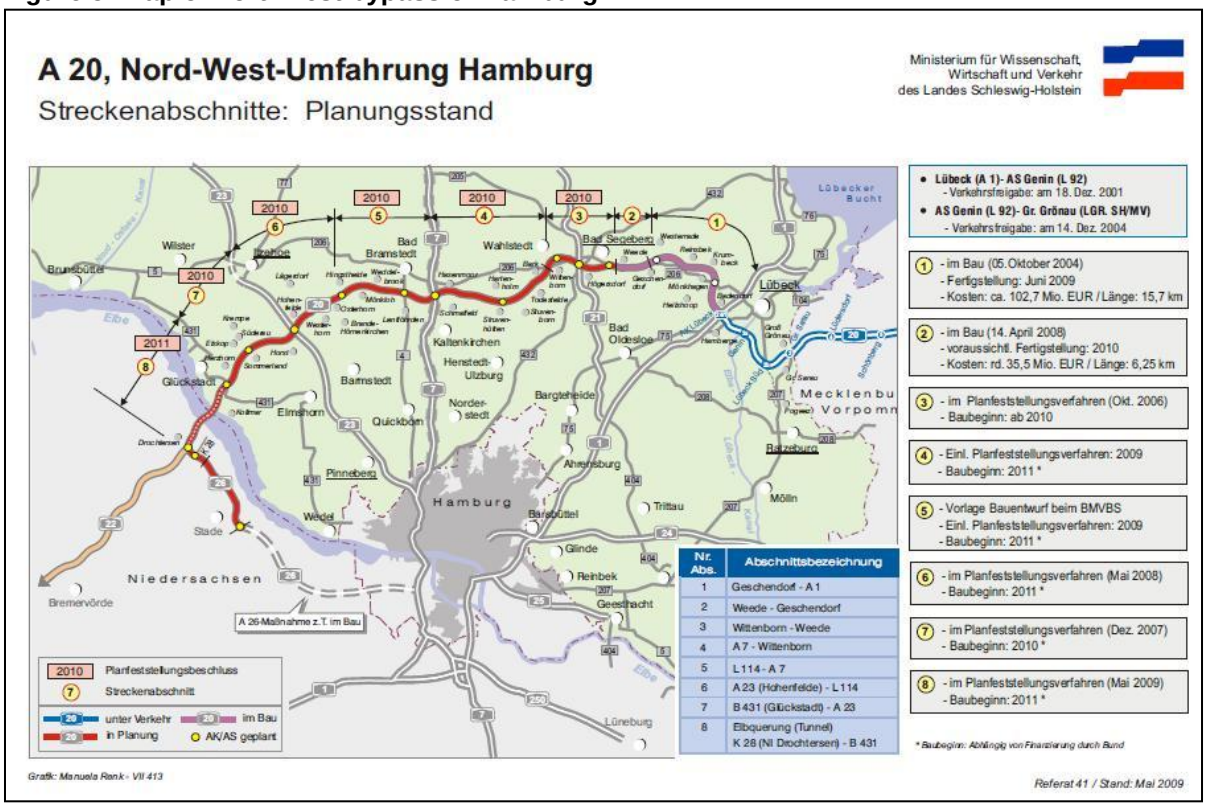



(Source: DEGES, 2009b [online])

Major associated development North-West bypass of Hamburg *(Nordwestumfahrung Hamburg)*

The motorway A 20 will continue westbound around the city of Hamburg and meet the motorways A 22 and A 26 near the city of Stade. Two main aims will be achieved with this new construction: the hinterland connection of the German seaports and further development of transportation infrastructure for the enlargement of the European Union. (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2003)

**Figure 5: Map of northwest bypass of Hamburg**




(Source: Ministerium für Wissenschaft, Wirtschaft und Verkehr Schleswig-Holstein, 2009 [online])

Since this development was not part of the initial planning process of VDE 10, it is not considered further in this report.

Parent project: The German Unity Transport Projects *(Verkehrsprojekte Deutsche Einheit, VDE)*

The different projects are mainly located in the new Federal states, however there are also some sections in the area of former Western Germany. They are all connected to new constructions or extensions of road projects in the new Federal States.

**Figure 6: Map of VDEs**


(Source: DEGES, 2007b, p. 35)

**Current status**

Main project: German Unity Transport Project 10 *(Verkehrsprojekt Deutsche Einheit 10 (VDE 10))*

After having completed different discontinuous sections after the end of 2000, the complete motorway was opened in December 2005. (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2006, p. 16)

Major associated development: B 96 n connection Stralsund / Rügen *(B 96 n Zubringer Stralsund / Rügen)*

The southern part, from the interchange with the motorway to the village of Altefähr, including the newly constructed bridge over the Strelasund, is completed. The section on the mainland was opened in 2004; the crossing of the Strelasund was finally opened on 20 October 2007. The section on the island is currently in the status of planning approval (DEGES, 2007b, p5). The most current planning status is actually the third hearing and the disclosure of local plans and the Environmental Impact Assessment (until 19 June 2009). A debate is scheduled for 13 July 2009.

The estimated start of construction is 2010, with a possible opening date in 2014. (Rüganer Anzeiger, 22 Oct 2008)

Parent project: The German Unity Transport Projects *(Verkehrsprojekte Deutsche Einheit, VDE)*

Most parts of the German Unity Transport Projects are completed. Altogether more than 1770km have been completed and another 130km are under construction. That represents about 90% of all road projects completed or under construction (information valid as of 1 July 2008). (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2008a, p. 2f.)

It is aimed to complete all but one of the VDEs before the end of the century. (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2008a, p. 3).

## B BACKGROUND TO PROJECT

### Principal project objectives

Objectives of the VDEs in general

As formulated in the Federal transport network plan (Bundesverkehrswegeplan) 1992:

- Consolidation of basic principles of the single European market;
- Overcoming of outcomes of the German Division;
- Promotion of rail bound transport and development of a sustainable transport mechanism with ideal usage of advantages of the different modes of transport;
- Rapid improvement of transportation infrastructure in the new Federal states and adjustment to western quality standards.
  (Der Bundesminister für Verkehr, 1992b, p. 5)

As summarized in 2005 by Bundesministerium für Verkehr, Bau und Stadtentwicklung:

- Improvement of transportation infrastructure in the new Federal states;
- Transport connection of the new Federal states to the economic centres of the old Federal states;
- Creation of preconditions to achieve equal living conditions.
  (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 12)

Objectives of VDE 10

*Objectives of Minister of Transport (1992):*

- Improved connection of the Baltic coast area and major parts of Mecklenburg-Western Pommerania to the western German and European transportation network;
- Especially relief of the federal highway near the coast B105 as well as B104 and B96.
  (Der Bundesminister für Verkehr, 1992b, p. 35)

*Objectives of the Planning Agency Mecklenburg-Western Pommerania (2005):*

- Connection of the Federal State to the urban agglomerations of Lübeck/Hamburg in the west, Berlin in the south and Stettin (Poland) in the east;
- Connection to the remote parts of the Federal State in the north and in the east to the state capital Schwerin;
- Interconnection of middle-order centres and high-order centres and exploitation of tourism areas;
- Connection to the German highway and motorway network and by that improved international connections;
- Hinterland connection of the seaports and the local ferry traffic.
  (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 16)

*Objectives of Brandenburg (allover regional planning concept):*

- Creation of equal living and labour conditions in all regions of Brandenburg;
- Sustainable protection of housing, business, infrastructural, and environmental potentials as well as protection of sufficient supply for the population;
- Enduring conservation of nature;
- Protection and consolidation of existing spatial structure and development potential.
  (DEGES, 1994, p. 4 f.)

*Objectives in Schleswig-Holstein:*

- Gap closing of important interconnection of trunk road network;
- Transfer of traffic load from federal and state highways to motorway;
- Traffic relief in the inner city;
- Less noise exposure and contaminant loads for residents.
  (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p.36)

*Objectives of EU:*

The European Regional Development Fund (ERDF) and its transport policy were also employed to finance parts of the BAB 20. From motorway exit Grimmen/Ost to motorway exit Strasburg the European Union contributed EUR 26m of a total of EUR 374m. (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2009b [online])

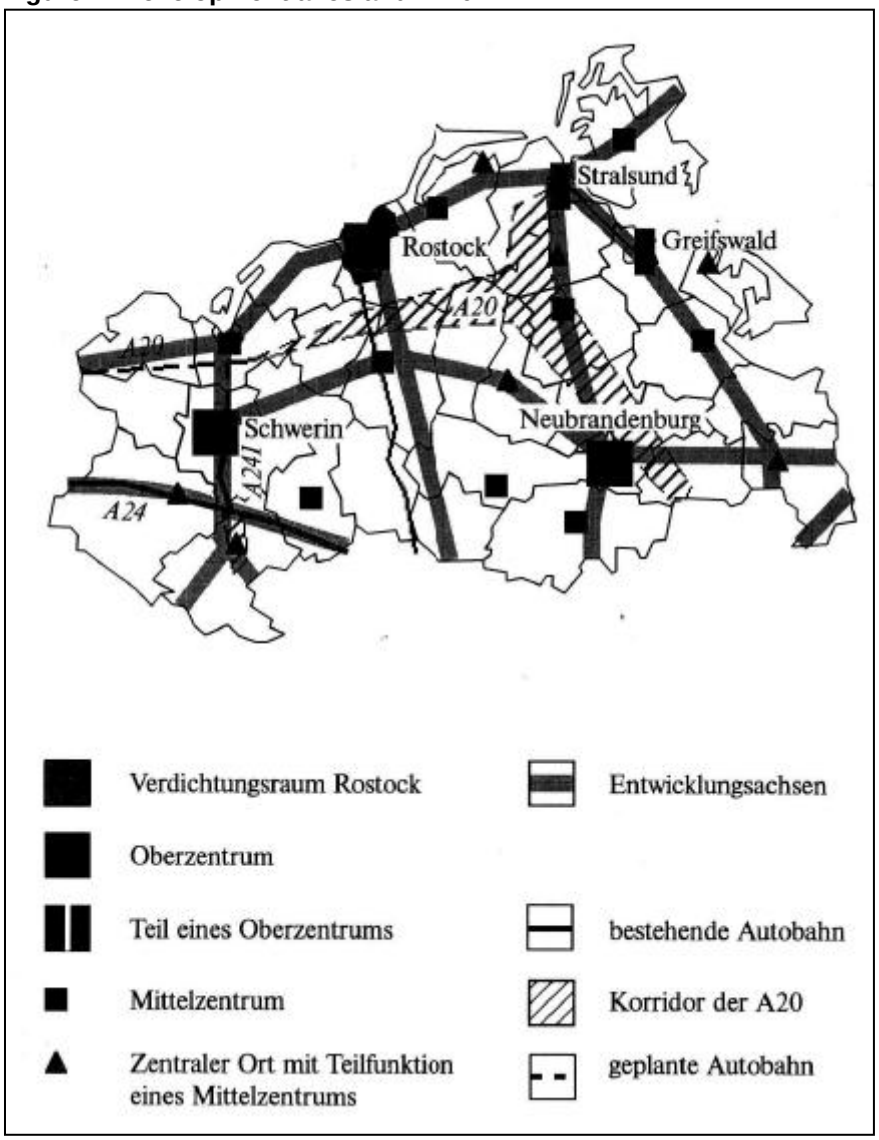
In general a good connection for the ports along the Baltic Sea coast is crucial to their viability. In ferry traffic, short term needs, such as closing of unprofitable lines, changes of ships and enabling of new connections, can be realised much faster than could ever be done in road connections. However, ports need planning reliability regarding road connections (Hader, 1996, p. 322). VDE 10 and its major associated development the B 96 n connection Stralsund / Rügen (B 96 n Zubringer Stralsund / Rügen) supply a long term and efficient hinterland connection for ports.

**Route option development**

In Mecklenburg-Western Pommerania, different route options were discussed. The southern route option would have had no effect on the coastline and no ecological advantages, and the estimated traffic load would be the lowest. Thus, the southern route option was eliminated from the planning process at an early stage. A too northerly route alignment would have only a relieving and connecting effect for the areas near the coastline. Summing up all advantages and disadvantages, the mid and mid-northern route options were taken into closer consideration. (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 20f.)

However, the intermediate route option (and finally built motorway) runs alongside development axes, as identified by Federal State Planning Agency of Mecklenburg-Western Pommerania. (Marquardt-Kuron, 1996, p. 280 f.). See figure 7 (the dark grey monochrome coloured thick lines are development axes, the hatched area represents the planning area).

**Figure 7: Development axes and A 20**




Source: Marquardt-Kuron, 1996, p. 281

In Brandenburg a southern route option (around the city of Prenzlau to the village of Wolfshagen) was abandoned as the estimated traffic load was too low and simultaneously the environmental impacts were severe. Also Mecklenburg-Western Pommerania favoured a more northern route. The final route option was chosen mainly due to the importance of habitat for endangered animals and plants in the area. (DEGES, 1994, p. 6)

In Schleswig-Holstein the objectives were mainly to develop a local bypass of the southern part of Lübeck and in general a better connection to the port of Lübeck. An interchange with BAB 1 was possible in two different places: north and south of the city. An environmental impact assessment came to the conclusion, that the northern route option would have less impact on the environment. However due to traffic loads and traffic relief in the inner city, less noise exposure and contaminant loads as well as more effective land use planning, the southern route option was finally realised. Those land use aspects were better development impulses for business locations, an enlargement of the University of Lübeck and a better connection of housing areas, resulting in an estimated gain in quality of life in Lübeck. (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 36)

## Key enabling mechanism

Description of key enabling mechanism

In general it was set value on opening parts of the motorway, which were supposed to have a high traffic load and are located in regions without proper transportation networks, quite early. Therefore the motorway was subdivided into traffic part units, the so called *Verkehrseinheiten* (*VKE*). These are parts of the motorway, usually located between later motorway exits, which could already reach a high traffic load, even though the whole motorway is not completely opened (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p16f). By measures such as *Verkehrswegeplanungsbeschleunigungsgesetz* (Act of the Acceleration of Transport Infrastructure Planning) and *Investitionsmaßnahmegesetz* (Act of Investment Measures) some planning stages were done completely by DEGES. Thus, planning and construction in general was accelerated by a large amount and the usual amount of time for planning was cut in half. The strongest point of criticism was that the Federal Government (by means of DEGES) took over tasks during planning procedure that originally are tasks for (regional) public authorities, as manifested in the Basic Constitutional Law of the Federal Republic of Germany (Krause, 1996, p295 ff.)

**Table 1: Key enabling mechanisms**

| **Pilot survey (*Voruntersuchung*) (Development of route options)** | **Different route options with respect to estimated traffic load and ecological impacts are analysed** |
|---|---|
| Regional Planning Procedure (*Raumordnungsverfahren*)<br><br>(Evaluation of Federal State)<br><br>Result: regional masterplan of routing | In the Regional Planning Procedure stage, the compatibility of the transportation project with land use matters and environmental aspects is verified. Route options, environmental impact assessment, and estimated traffic loads are bases for this procedure. All affected public agencies and organizations participate. |
| Route determination procedure<br><br>(preliminary administrational decision) | The Federal minister of transport passes a law, according to § 2 *Verkehrswegeplanungsbeschleunigungsgesetz* (Act of the Acceleration of Transport Infrastructure Planning), to determine the final route. This is mandatory for all planning agencies involved. |
| Project design | The layout contains technical planning, including the landscape conservation accompanying plan. Coordination with public agencies and the German Federation as awarding authority is realised. |
| Plan-approval procedure<br><br>Result: Plan-approval order | Different interests are mutually weighed. The legitimacy of the project is bindingly ascertained. |
| Implementation planning | Once plan-approval order exists, the technical planning of road and bridge construction is developed ready-for-use. |

Source: Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 18

Key enabling mechanism timeline

**Table 2: Key enabling mechanisms timeline**

| Time | Event |
|---|---|
| March 1991 | Planning order of the German Federal Ministry of Transport for the Federal states Schleswig-Holstein, Mecklenburg-Western Pommerania and Brandenburg. |
| Spring 1991 | Enactment of the status of acuteness (*vordringlicher Bedarf*) to the VDE-projects by the Federal Government. |
| Summer 1991 | Initial start of planning for BAB 20 from BAB 1 to the city of Rostock supported by Road Construction Agency Schleswig-Holstein. |
| 16 December 1991 | Enactment of Act of the Acceleration of Transport Infrastructure Planning (*VerkPBG*). |
| May 1992 | Acceptance of responsibility for the project (306km in Mecklenburg-Western Pommerania and Brandenburg) by DEGES. |
| July 1994 | End of Regional Planning Procedure in Mecklenburg-Western Pommerania. |
| January 1994 | Route determination procedure by the Ministry of Transportation for the section Neukloster to the frontier of Mecklenburg-Western Pommerania and Brandenburg. |
| May 1995 | End of Regional Planning Procedure in Brandenburg. |
| July 1995 | Route determination procedure by the Ministry of Transportation for the section BAB 1 to Schönberg. |
| September 1995 | Route determination procedure by the Ministry of Transportation for the section frontier of Mecklenburg-Western Pommerania and Brandenburg to the three way motorway interchange Uckermark. |

(Source: Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 19)

Key decision makers

Federal Minister of Transport:
18 Jan 1991 – 13 May 1993: Günther Krause / CDU (Christian Democratic Union)
13 May 1993 – 26 Oct 1998: Matthias Wissmann /CDU
26 Oct 1998 – 29 Sep 1999: Franz Müntefering /SPD (Socialdemokratic Party)
29 Sep 1999 – 16 Nov 2000: Reinhard Klimmt / SPD
20 Nov 2000 – 22 Oct 2002: Kurt Bodewig / SPD
22 Oct 2002 – 22 Nov 2005: Manfred Stolpe / SPD
22 Nov 2005 – to date: Wolfgang Tiefensee / SPD

Minister of Economics (Mecklenburg-Western Pommerania):
28 Oct 1990 – 08 Dec 1994: Conrad-Michael Lehment / FDP (Free Democratic Party)
08 Dec 1994 – 06 May 1996: Dr. Harald Ringstorff / SPD
06 May 196 – 02 Nov 1998: Jürgen Seidel / CDU
02 Noc 1998 – 17 Apr 2001: Dr. Rolf Eggert / SPD
17 Apr 2001 – 07 Nov 2006: Dr. Otto Ebnet / SPD

Minister of Transport (Schleswig-Holstein):
31 May 1988 – 05 May 1992: Dr. Franz Froschmeier / SPD
05 May 1992 – 19 May 1993: Uwe Thomas / SPD
19 May 1993 – 28 Oct 1998: Peer Steinbrück / SPD
28 Oct 1998 – 28 Mar 2000: Horst Günter Bülck / SPD
28 Mar 2000 – 17 Mar 2005: Dr. Bernd Rohwer / SPD
17 Mar 2005 – 08 Jul 2008: Dietrich Austermann / CDU

Minister of Transport (Brandenburg):
01 Nov 1990 – 31 Aug 1993: Jochen Wolf / SPD
31 Aug 1993 – 23 Sep 2003: Hartmut Mayer / SPD
23 Sep 2003 – 29 Nov 2006: Frank Szymanski / SPD

DEGES:
07 Oct 1991 – 31 Dec 2008: CEO (commercial and juristical): Hans Jörg Klofat
1998 – 31 Aug 2006: CEO (technical): Hans-Jörg Kleffner

**Main organisations involved**

Planning and construction phase

*DEGES*

To realise planning and construction of the VDEs, the project-management-incorporation DEGES (*Deutsche Einheit Fernstraßenplanungs- und Baugesellschaft mbH* / German Unity Arterial road planning and construction company) was founded on 7 October 1991.

The company's ownership: From 1991 to 1995, the Federal Government and the Rhein-Main-Donau-AG (public authority) each owned 25%, while each of the five new Federal states owned 10%. From 1995 to 2006 the share of the Federal Government rose to 50%, after the privatisation of the Rhein-Main-Donau-AG (Remmert, 2003, p. 80). Schleswig-Holstein and the Free and Hanseatic City of Hamburg became shareholders in 2007 and 2008 respectively, leading to the actual share:

**Figure 8 - Stakeholders of DEGES**


(Source: DEGES, 2009a [online])

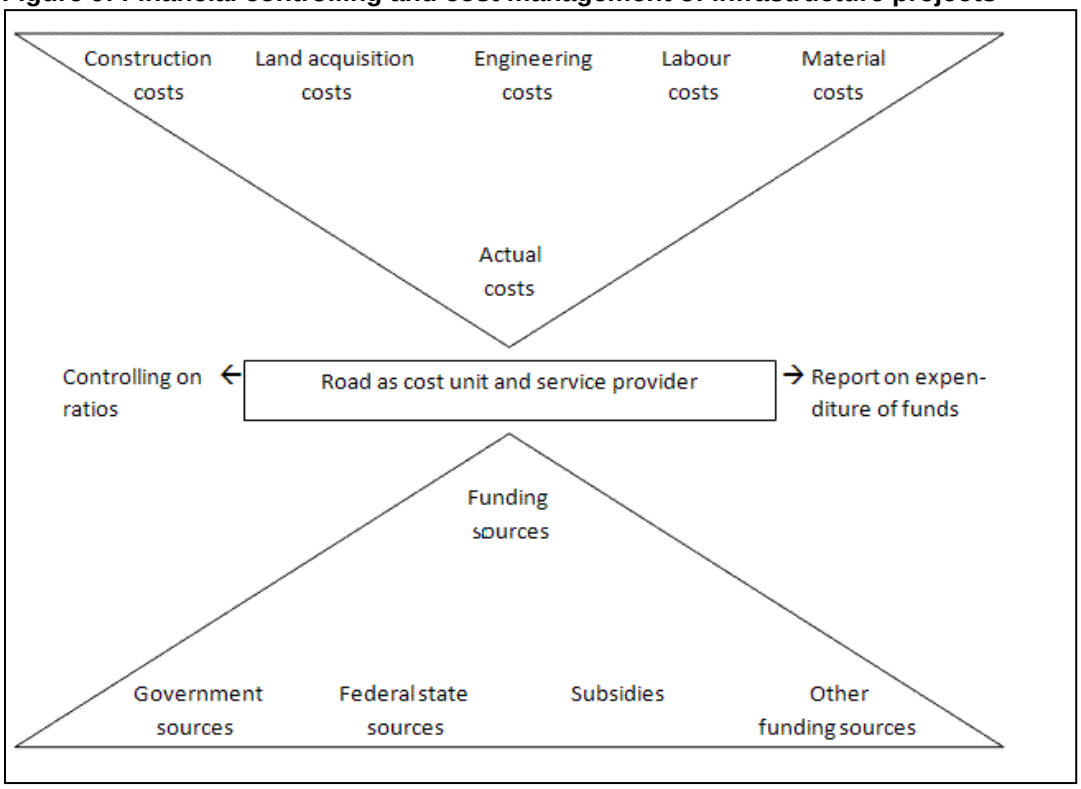
During the planning and construction of VDE 10, Schleswig-Holstein was not a shareholder in DEGES. Therefore the BAB 20 in the district of Schleswig-Holstein was planned and built by the *Straßenbauverwaltung* of the Federal State. Since 2005 it has been organised as *Landesbetrieb Straßenbau und Verkehr Schleswig-Holstein* (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p14).

In 1999 DEGES had about 260 employees (Remmert, 2003, p85), while in 2006 it had about 245 employees (DEGES, 2006, p9) and in 2007 about 210 (DEGES, 2007a, p4).

*Financial engineering and cost management of DEGES:*

The initial stage of realising transportation infrastructural projects is to regard the project (i.e. the road) as a cost unit and service provider. Structuring and analysis of construction costs by means of cost-benefit calculations on actual cost bases provide full cost transparency. To realise financial engineering DEGES developed a computerised system on the basis of SAP/R3 and mySAP-ERP for cost and contract management, especially for public clients (DEGES, 2006, p. 31).

**Figure 9: Financial controlling and cost management of infrastructure projects**




Source: DEGES, 2006, p. 31; translated by author

*European Union*

The European Regional Development Fund (ERDF) and its transport policy were also employed to finance parts of the BAB 20. However, European funding only played a minor role in financing the development (Bundesministerium für Verkehr, Bau und Stadtentwicklung).

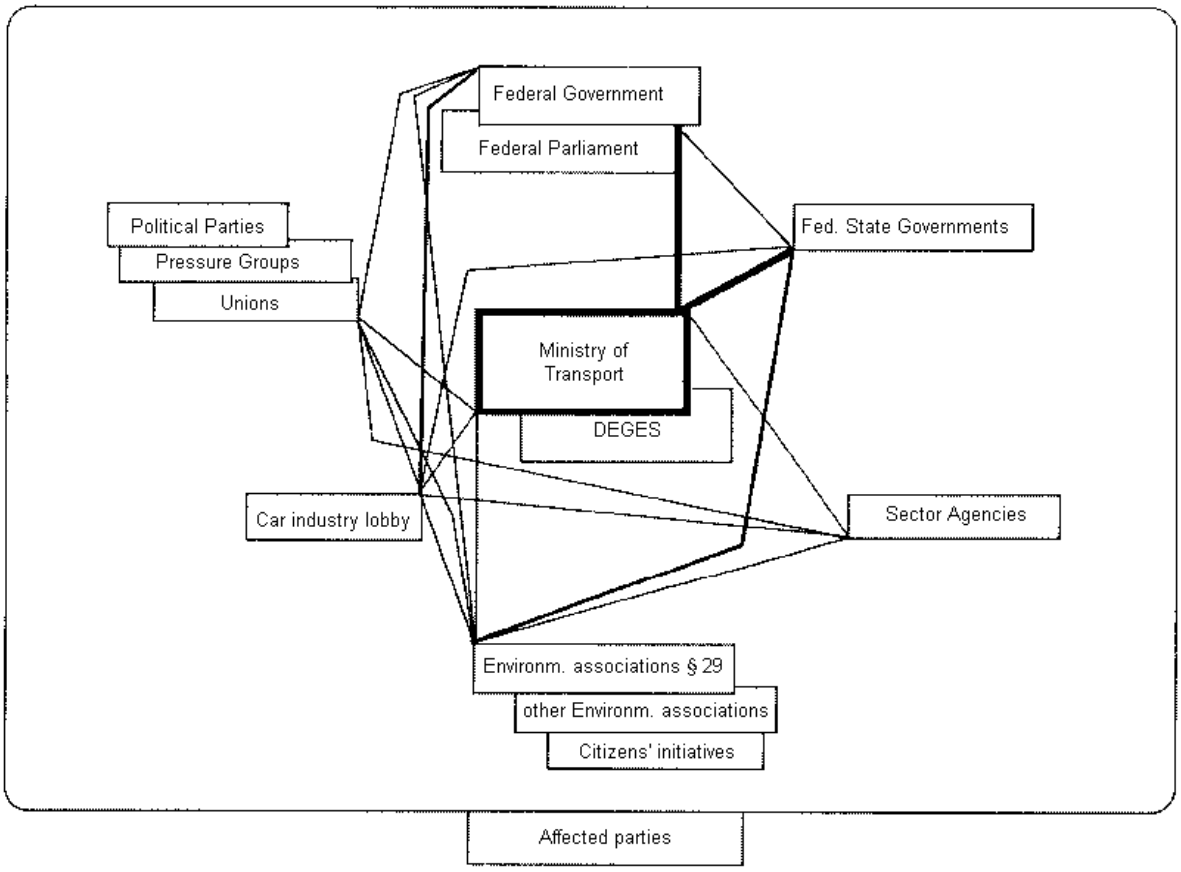
As one of seven projects co-financed by the EU, DEGES is also in charge of managing the funding and development stages. The tasks are:

- Developing the application for support;
- Quarterly cost reports;
- Developing changes to the application;
- Assisting with substantial verifications by national and European control entities;
- Providing reports on expenditure of funds.

(DEGES, 2006, p. 33)

In all phases the state (Federal Government) was the main stakeholder and therefore has a major influence on the whole project. Of course other actors also have influence, either direct (e.g. the Federal State Governments) or indirect (the car industry lobby). Figure 10 provides an overview of all affected parties, their relationships to each other and their influence (displayed by the thickness of the lines). This figure was part of a policy analysis by Matthias Krause in 1992. The European Union was not involved at this time.

**Figure 10: Policy-network of A20 actors**




(Source: Krause, 1996, p. 299; translated by author)

Operations phase

*Federal Government and Federal States*

Federal highways and motorways are owned by the German Federation and are in general operated on behalf of the German Federation by the Federal States (Art. 90 GG). Funding of the operational phase derives from governmental sources.

*Public road and motorway surveillance centres*

Maintenance of the motorways is conducted by surveillance centres, which are financed by the Federal States. In Schleswig-Holstein the road surveillance centre Bad Oldesloe, in Mecklenburg-Western Pommerania the motorway surveillance centres Upahl, Kavelstorf/Süderholz and Glienke, and in Brandenburg the motorway surveillance centre Gramzow are responsible for security and service along the motorway (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p91).

## Planning and environmental regime

Outline of planning legislation

"The federal structure of the state with the three levels of federal, state, and local government is decisive for the system of spatial planning in Germany. Spatial planning is accordingly decentralised in this country. The distribution of competence and functions between the three levels of government produces a system with legally, organisationally, and substantively differentiated planning levels. While they are legally, organisationally, and substantively defined and clearly differentiated, they are interlinked by the mutual feedback principle as well as complex requirements of notification, participation, coordination and compliance. Federal spatial planning is limited essentially to the development of guiding principles and principles of spatial planning which also provide the legal basis for state spatial planning and superordinate specifications for sectoral planning." (Pahl-Weber et al., n. d., p10). However, there are some exceptions to the limitation of the sole guiding and legislative character of federal spatial planning. The main transportation axes, such as major railways and larger highways as well as motorways are under the responsibility of the federal government.

"The Federation plans supra-local, linear road infrastructure projects for federal highways in accordance with the Federal Highways Act. National trunk roads are federal motorways […] and federal highways […] as required by the Trunk Road Extension Act, which are approved in a multi-stage procedure – investment plan, spatial planning, routing procedure, plan approval procedure, or, in simple case, planning permission. The Trunk Road Extension Act lays down the traffic requirements for the construction of new federal trunk roads. The Act of the Acceleration of Transport infrastructure Planning […] provides the basis for speeding up seven trunk road projects. Trunk road planning, being spatially significant, is to be harmonized as well as coordinated with spatial planning requirements under a special procedure. In the ensuing routing procedure under Section 16 of the Federal Highways Act, a corridor is agreed by the Federation and the states within which future, specific road planning (planning approval) is to be situated. The construction, alteration, or extension, and operation of federal trunk roads are subject to planning approval, or, in simple cases, to planning permission pursuant to the Federal Highways Act. Under Article 90 of the Basic Law, federal motorways and federal highways are built and administered by the states (state highway department) on behalf of the Federation. Planning approval procedure and planning permission is regulated by Section 17 of the Federal Highways Act." (Pahl-Weber et al., n. d., p65f).

The BAB 20 was subdivided into numerous planning sections (two in Schleswig-Holstein, 22 in Mecklenburg-Western Pommerania and two in Brandenburg) to keep the planning procedures manageable for all parties concerned and to open traffic part units quite early. For every planning section a separate plan-approval procedure is conducted (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p18).

Environmental statements and outcomes

In general the 17 VDEs (especially the nine railway and one waterway projects) were advertised as being environmentally friendly, or at least having positive impacts in reaching a sustainable combination of different traffic carriers. Compensation measures should be introduced, where harm to the environment is unavoidable. The Federal Minister of Transport also praises achievements in Germany's environmental politics which are not related to new road planning and construction, such as environmentally friendly passenger cars (Der Bundesminister für Verkehr, 1992b, p6).

During the planning and construction process of VDE 10 it was stated that the importance of environmental issues was higher than in any other VDE (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p20).

- "The environment ranks first" (DEGES, 1996, p17)

- "Nature and environment have high priority " (Wirtschaftsministerium Mecklenburg-Vorpommern, 2000, p12)

It was never denied that the motorway construction would cause severe environmental impacts; but it remains unclear whether compensation measures were strong enough to fully compensate for them. Many environmental agencies, such as BUND and Greenpeace, as well as smaller locally organised agencies, criticized the A 20. The strongest point of criticism is the route option chosen in Schleswig-Holstein. A much more environmentally friendly northern option was dismissed and the southern alternative, which involved crossing the environmentally protected Wakenitz (Kieler Nachrichten, 16 Aug 2004) was realised due to traffic and infrastructural benefits (see 2.1).

All environmentally related claims were dismissed, so the motorway was built as planned.

However, the outcomes of the motorway construction are the related compensation areas, with measurements and (desired) ecological effects as described below (see 'Ecological mitigation'). The largest areas are:

- Groß Tessiner See und Beeke (150 hectare), lake and beck;
- Waidbachtal (216 hectare), valley;
- Wolfsberger Seewiesen (220 hectare), meadows;
- Trebelpolder (450 hectare), polder;
- Richtenberger See (175 hectare), lake
- Polder Rustow-Randow (310 hectare), polder
- Großer Landgraben (500 hectare), trench
- Großer Koblentzer See (500 hectare), lake.

(Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 23)

Overview of public consultation

For every planning section a separate plan-approval procedure is conducted. "This procedure involves weighing and balancing both the interests of the developer and any public or private interests which might be affected by the development project." (Pahl-Weber et al., n. d., p60). Construction plans and corresponding explanation reports, which explain how the motorway shall be constructed in the relevant section, form the subject matter of plan-approval procedures. These documents are freely accessible to the public. Before a given deadline all public agencies, nature conservation organisations and affected citizens can submit their comments and file objections to the plans. The planning approval authority decides on the comments and objections, balancing all public and private interests as well as environmental matters. The planning approval procedure is complete when the plan approval order is achieved. The planning approval authorities were:

**Table 3 - Planning approval authorities**

| **Federal State** | **Planning approval authority** |
|---|---|
| Schleswig-Holstein | Landesamt für Straßenbau und Verkehr |
| Mecklenburg-Western Pommerania | Wirtschaftsministerium |
| Brandenburg | Ministerium für Stadtentwicklung, Wohnen und Verkehr |

Planning approval procedures were conducted step-by-step from 1996 to 2003 in Mecklenburg-Western Pommerania and Brandenburg and between April 1997 and the end of 2000 in Schleswig-Holstein (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p19).

Ecological Mitigation

*Conceptual specifics of BAB 20:*

- A complex route determination procedure including numerous comparisons of different route options;
- Small-scale route optimisation to keep the motorway away from settlement areas;
- Minimisation of fragmentation effects by constructing viaducts, motorway bridges and wildlife crossings;
- Spacious cross linking of biotops and habitats;
- Controlled renaturation arrangements;
- Transparent design and interference-minimisation construction of bridges;
- Specific requirements and obligations of some constructions (such as Crossing of Wakenitz, Warnow, Trebel, and Peene).

(Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 22)

Although quite high attention is paid to environmental issues, the construction of the BAB 20 (as well as every motorway construction) results in some more or less severe environmental impacts. According to the 'polluter pays principle' compensating measures have to be implemented for all areas where harm to the natural environment is unavoidable. How the measures look in detail is elaborated, together with responsible Environmental Protection Authorities, and is fixed in the accompanying landscape conservation plan.

The objective of all compensation measures is the functional adjustment of unavoidable impacts. The objectives are achieved amongst others by:

- Re-water logging of drained grassland to establish marsh areas and wet meadows and especially swamp renaturation;
- Planting of wet and deciduous forests;
- Planting and forestage of dry grassland;
- Ecologic flowing water embodiment;
- Generation of standing water bodies and periodic water-bearing tarns;
- Planting of riparian wood;
- Extensification of agricultural land;
- Replanting of alleys and hedges.

(Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 23)

While small-scale compensation measures adjacent to the route of the motorway were already developed during the planning stages, around 50% of all measures were realised in large-scale compensation areas, each between 100 and 500 hectares.

Large scale compensation measures have several advantages:

- Relief of agricultural farms adjacent to the motorway, which are already strained by land use matters;
- More efficient and economic planning, land acquisition, construction, maintenance and control by connected, compared to non-connected, areas;

- Large scale land acquisition as a precondition for ecologic profound swamp renaturation, because adjacent occupants are not harmed by an increased groundwater table;
- Usage of agricultural unprintable areas with less commercial stock.

(Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 24)

Altogether about 7,660 hectares of land were used. Of this total, 2,019 hectares were used for the actual motorway, its onramps, service areas and petroleum stations, while 5,641 hectares were used for compensation areas (author's calculation, data source: Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 34 - 88).

Regeneration

*Environmental regeneration measures*

See 'Ecological mitigation'.

*Archaeology*

Archaeological examinations were conducted in three different phases:

- Phase I: Identification of archaeological find spots along the planned route, mainly by sharding and analysis of aerial photographs. Most of the identified find spots were unknown before. The total number of find spots along the route is about 600, and only 100 of them were known before.

- Phase II: Preliminary inspections. With excavators about 2m wide and 100m long, test trenches were generated to clarify the condition of the historical site.

- Phase III: When scientific importance and archaeological heritage was given, the find spots were uncovered completely (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p100).

By archaeological excavations, traces and relics of almost all phases of settlement history of the southern Baltic coast line were discovered, enlarging knowledge about living in the past.

For a summary see Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, pp100–104. For detailed archaeological information see Archäologisches Landesmuseum und Landesamt für Bodendenkmalpflege Mecklenburg-Vorpommern, 2005.

*Heritage*

Admittedly, design varieties in motorway construction are rare. The only way heritage and locally specific design could be realised is in the style of bridges and viaducts along the motorway. Thus, heritage is reflected in the western part (frontier Schleswig-Holstein/ Mecklenburg-Western Pommerania to AK Rostock) by using cobblestone brick facing and in the central part (AK Rostock to AS Greifswald) by using brick lined facing. Further design elements were the colours used at bridges and viaducts (reddish brown as well as grey blue and grey green). In the eastern part (AS Greifswald and AD Uckermark) modern style elements in the shape of skewbacks and piles, as well as structure and colour of concrete, were used (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p30f).

*Economic and labour market issues*

In 1996 DEGES estimated that about 950 jobs would be created during the construction phase and about 6,340 during the operational phase (DEGES, 1996, p15). It was not mentioned how long the operational phase is supposed to last for the purposes of this estimation. No such numbers after completion of the project were published.

In 2001 Kirsten Wegner wrote her diploma thesis about the estimated effects the motorway construction has had on local economics in Mecklenburg-Western Pommerania. She came to the following conclusion:

> The location factor "transportation infrastructure" did not play a major role in choice of location for enterprises. Therefore the motorway construction did not lead to a significant economical improving in the region. Wegner examined business parks near and farther away (from) A 20, and discovered that concerning the degree of capacity utilisation, the business parks in and near the city of Wismar were more used to capacity than those near the motorway. In neither of the examined regions a difference to the all over trends of unemployment could be ascertained (Wegner, 2001, pVI).

Appraisal methods

*German Federal Transport Infrastructure Plan 1992:*

All VDEs are part of the German Federal Transport Plan 1992. They were developed in advance but were fully included in the plan. VDEs have a key function for the objectives of the plan. Therefore no time regarding planning procedure should be wasted. Before they were integrated into the plan, they were appraised once more. Their necessity and acuteness have been attested again.

All projects contained in the German Federal Transport Plan have been appraised in the following ways:

- Macroeconomic appraisal: cost-benefit analysis;
- Ecological appraisal: environmental risk analysis;
- Urban development: consequences for urban areas of trunk road development;
- Further criteria.

For all projects priority levels were assigned. All VDEs have top priority. Ports have to be well connected to the road network (Der Bundesminister für Verkehr, 1992a).

*Planning process:*

Pilot survey
- Development of route options

Regional Planning Procedure
- Compatibility with Federal State planning
- Route options
- Environmental impact assessment
- Estimated traffic loads

Plan-approval procedure
- Environmental impact assessment
- Mutual weighing of different interests

After reporting on the progress of all VDEs it is maintained that all VDEs still have top priority. They are part of the contentious and activity-scheduled projects.

Complaints procedures

During the plan approval procedure numerous comments and objections on the plans were filed. The extent to which they were observed and taken into account during planning for the whole motorway is impossible to ascertain. However, planning approval authorities are obligated to decide on comments and objections received, balancing public and private interests as well as environmental matters. For three planning sections (Schöneberg - Grevesmühlen, Grützkow – Jarmen, and Lübeck) administrative claims were filed. All claims were dismissed.

Due to the shortened planning phase (see description of key enabling mechanisms) there are criticisms that public participation was largely curtailed (Krause, 1996, p295ff). Numerous citizens' initiatives (*Bürgerinitiativen / BI*) were involved. Although the exact number of initiatives cannot be identified, there were federations of about 40 initiatives in Schleswig-Holstein and about 20 initiatives in Mecklenburg-Western Pommerania. However, they did not have a high presence in the media and in Meckleburg-Western Pommerania in particular they did not have significant support among the population. (Krause, 1996, p306f.)

**Land acquisition**

Land needs to be bought for the construction of the motorway, its onramps, petroleum and service stations as well as for compensation measures. The Federal Road Construction Agency commissioned the responsible agencies of the Federal states to undertake land acquisition.

Schleswig-Holstein

- Length of motorway: 16.8km;
- 934 hectares of property were bought, including agricultural areas for substitutional land;
- 56 notarised deeds of purchase were filed;
- 34 barter agreements were filed. The substitution of land is voluntary;
- 610 hectares were used for compensation measures;
- 272 hectares were used for the construction of the motorway, its onramps, petroleum and service stations. Of these, only 51 hectares were used for sealed surfaces (concrete or asphalt). The remaining 221 hectares were used for unsurfaced parts of the construction, such as fill and cut slopes, banks, verges, separating strips, ditches, hollows, and rain containment pools. Another 52 hectares were used for sand removal.

(Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 28)

Meckenburg-Western Pommerania and Brandenburg

- Length of motorway: 306.4km;
- About 9,600 hectares of land were used;
- About 8,500 hectares were bought in direct land acquisition procedures; (freihändiger Grunderwerb) (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 28);

- No information is available on whether the remaining 1,100 hectares were acquisitioned by plan approval procedure, or were in public hands before, or had no owner before;
- About 60% (5,800 hectares) were used for compensation measures;
- About 40% (3,800 hectares) were used for construction of the motorway, its onramps, petroleum and service stations;
- Negotiations were conducted with over 5,100 landowners, on the acquisition of over 10,000 properties or parts of properties;
- Land acquisition negotiations with farmers on agricultural rank land were especially complicated;
- More than 80% of all areas were bought or the right to use them was filed. (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 28)
- No information is available on what happened to the remaining 20%.

In Brandenburg along the motorway section Damme – Frankenwalde it was obvious that the construction would have severe negative effects on agriculture and local culture in general. Therefore a land consolidation procedure was conducted in this area, with 2,268 hectares owned by 355 people taken into the procedure. The outcomes were more usable and accessible areas for agricultural purposes, a new road network with connecting functions between different villages, a new water and channel network, and the de-sealing of old sites of agricultural industry such as barns and silos (Ministerium für Ländliche Entwicklung; Umwelt und Verbraucherschutz des Landes Brandenburg, n. d.; p. 35 - 38).

# C PRINCIPAL PROJECT CHARACTERISTICS

## Detailed description of route

The motorway is located in three Federal states. Of the 323km total, 17km are in Schleswig-Holstein, 280km in Mecklenburg-Western Pommerania, and 27km in Brandenburg. In general the motorway runs in a northwest–southeast direction. As it has a longer east-west axis it is numbered with an even number, as is usual for all east-west-directional motorways in Germany. It runs along the coast of the Baltic Sea from the interchange with federal motorway A1 near the city of Lübeck mainly eastbound until the interconnection with Stralsund and Rügen. From there it runs mainly in a southeast direction to the interchange with federal motorway A 11. The motorway exits (AS) and interchanges (AD, AK) are listed below, with connecting main roads in brackets (L denotes *Landesstraße* or state highway). The major and intermediate travel nodes described in section 3.2 are in **bold** and the main engineering features described in section 3.5 are in *italics*.

- **AK Lübeck (A 1)**
- AS Genin
- AS A20 / B207 (B 207)
- AS Groß Sarau (B 207)
- AS Lüdersdorf (L 02)
- Petroleum and service station ‘Schöneberger Land’
- AS Schönberg (B 104)
- AS Grevesmühlen (L 03)
- AS Bobitz (L 031)
- AS Wismar –Mitte (B 208)
- *Viaduct Triwalk*
- **AK Wismar** (B 105 n, A 241 to 2006/A14 since 2006)
- AS Zurow (B 192)
- AS Neukloster (L 101)
- Petroleum and service station ‘Fuchsberg’
- AS Kröpelin (L 11)
- AS Bad Doberan (L 13)
- AS Rostock-West (B 103 n)
- AS Rostock-Süderstadt (L 132)
- *Viaduct Warnow*
- **AK Rostock (A 19)**
- AS Dummerstorf (B 103, L 191)
- AS Sanitz (B 110)
- AS Tessin (B 110)
- Petroleum and service station ‘Lindholz’
- AS Bad Sülze (L 23)
- AS Tribsees (L 19, L 192)
- AS Grimmen-West (L 19, L27)
- AS Grimmen-Ost (B 194)
- **AS Stralsund (B 96 n)**
- AS Greifswald (L 26)
- AS Gützkow (B 96, B 111)
- AS Jarmen (B 110 n)
- *Viaduct Peenetal*
- Petroleum and service station ‘Demminer Land’ (southbound)
- AS Anklamm (B 96, B 199)

- AS Altentreptow (L 273)
- AS Neubrandenburg-Nord (L 28)
- AS Neubrandenburg-Ost (B 197)
- AS Friedland i. M. (L 281, L 341)
- Petroleum and service station ‘Brohmer Berge’ (northbound)
- AS Strasburg (Uckermark) (L 32, B 104)
- AS Pasewalk-Nord (B 104)
- *Viaduct Ueckertal*
- AS Pasewalk-Süd (B 109)
- AS Prenzlau-Ost (L 26)
- AS Prenzlau-Süd (L 25)
- **AD Kreuz Uckermark (A 11)**

**Detailed description of main and intermediate travel nodes**

Main travel nodes

*AK Lübeck*

The AK Lübeck interconnects the BAB 1 (Heiligenhafen – Saarbrücken) and BAB 20. It is the northern and western starting and ending point of the VDE 10, technically during this time it was a motorway triangle. Since the BAB 20 continues westbound (see section 1.1.5) it serves now as a complete motorway interchange.

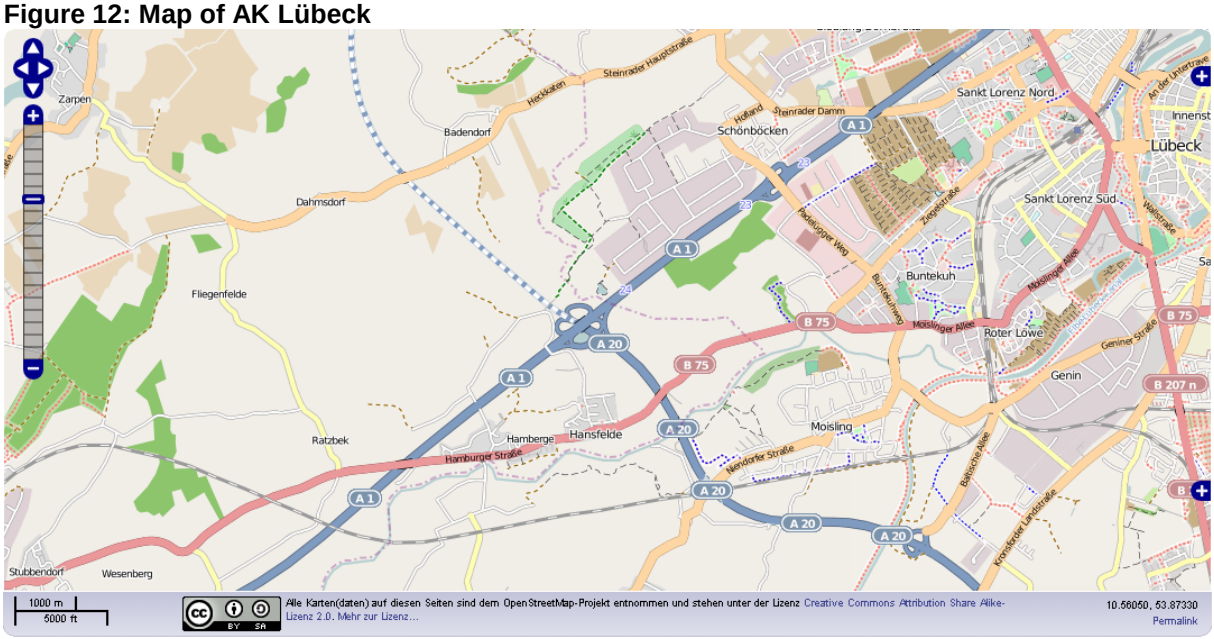
Its importance is due to the dual function of the interchange. It closes a gap in the trunk road network. It is also important on the local level, as Lübeck has a powerful southern bypass opened on 18 December 2001 and connected to the main parts of the BAB 20 on 14 December 2004.

It was constructed as a full cloverleaf interchange, with the BAB 20 on the lower level. Special attention was given to ensuring that traffic could pass the construction site on BAB 1 without major disturbance. (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p34ff.)

**Figure 11: AK Lübeck**

(Source: DEGES, 2005, p. 36)

**Figure 12: Map of AK Lübeck**




(Source: OSM)

*AK Wismar*

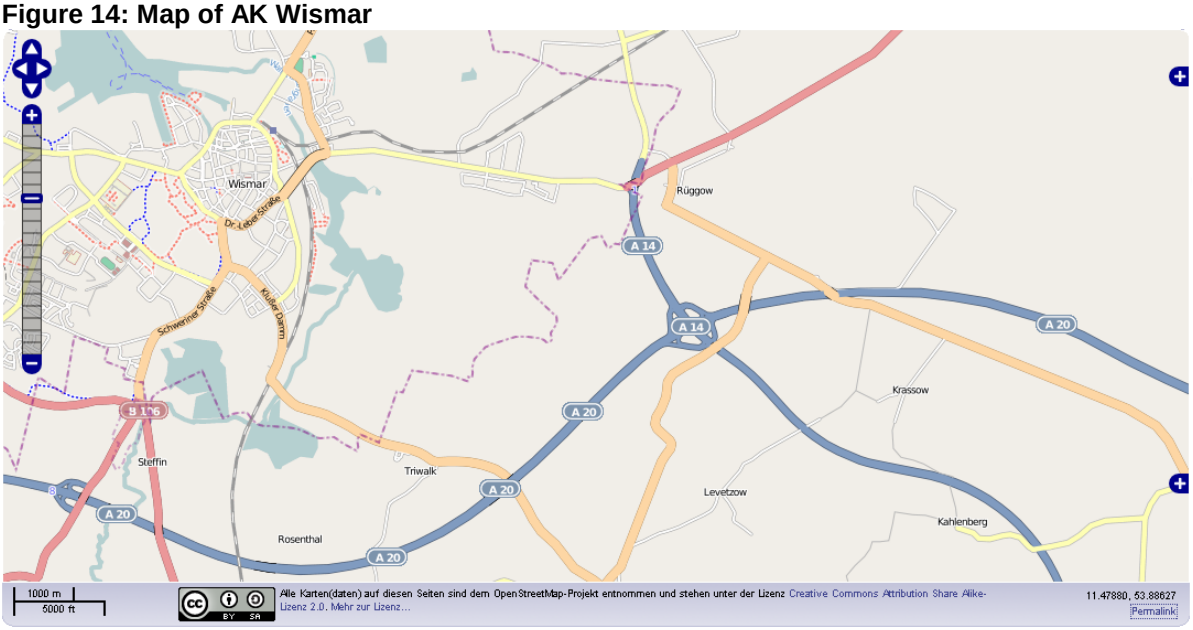
Originally the AK Wismar was planned just as a simple motorway exit (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p47). However, it was now constructed to interconnect the BAB 14 (former BAB 241) and the BAB 20. While the complete BAB 14 is still under construction (end status Dresden–Wismar), in the area of Wismar only a short piece of motorway is connected with BAB 20.

It was constructed as a full cloverleaf interchange, with the BAB 20 on the lower level.

**Figure 13: AK Wismar**


Source: Die Bundesregierung, n. d.

**Figure 14: Map of AK Wismar**




(Source: OSM)

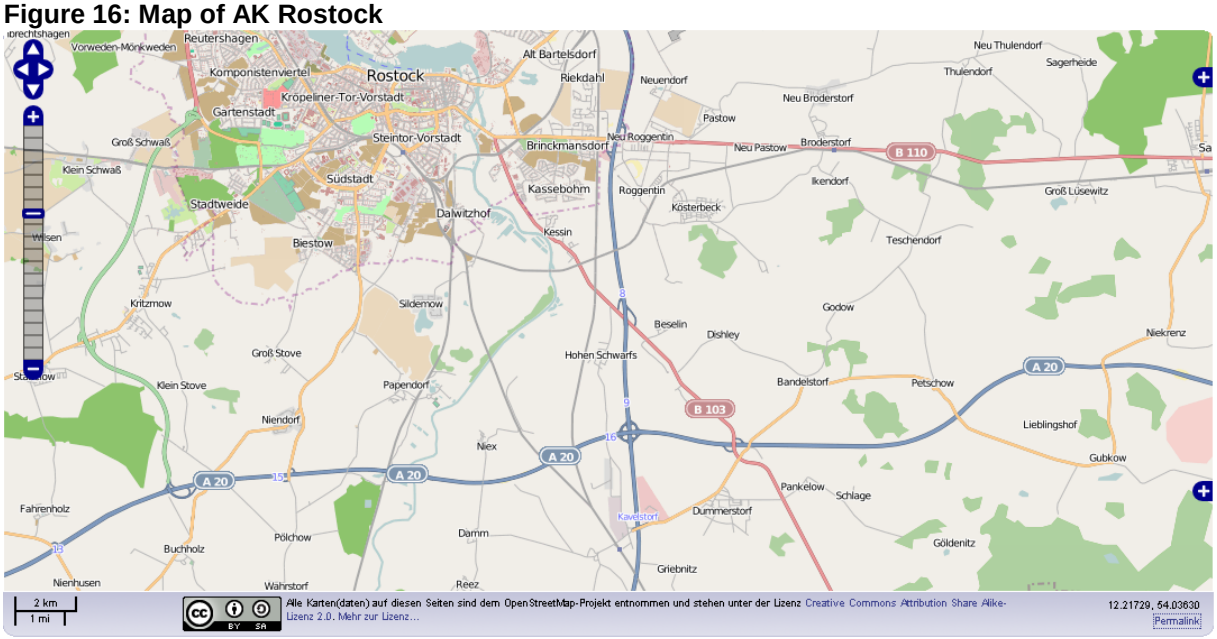
*AK Rostock*

The AK Rostock interconnects BAB 19 (Rostock to Wittstock/Dosse (Berlin)) and BAB 20. It was constructed as a full cloverleaf interchange, with the BAB 19 on the lower level.

**Figure 15: AK Rostock, under construction**

(Source: Wirtschaftsministerium Mecklenburg-Vorpommern, 2000, p. 7)

**Figure 16: Map of AK Rostock**




(Source: OSM)

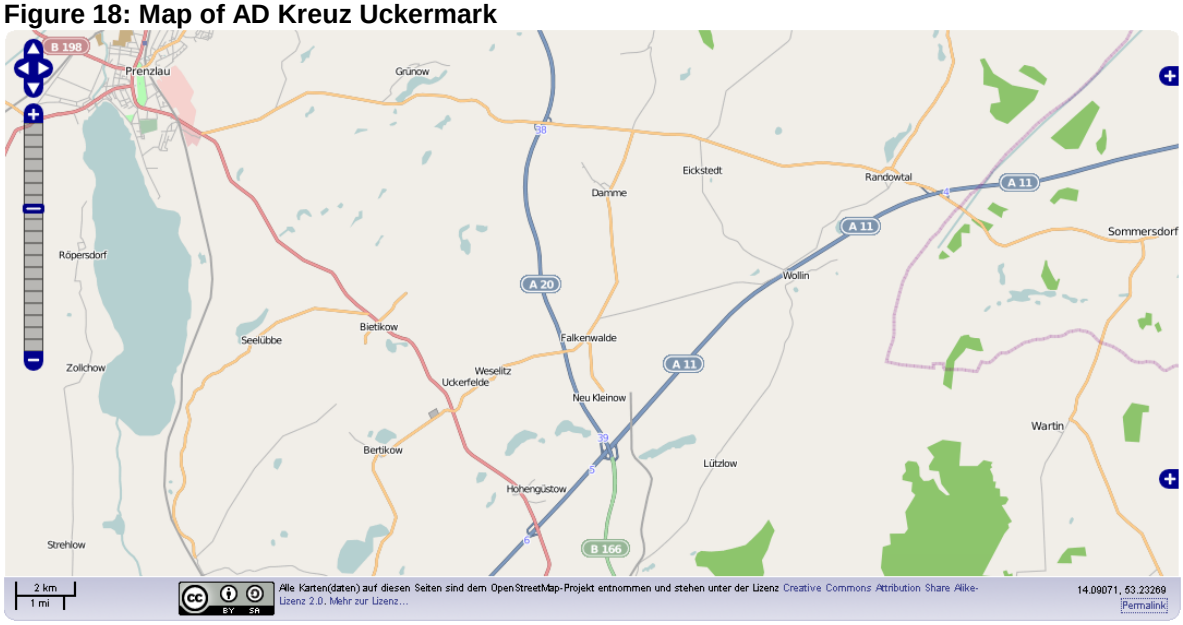
*AD Kreuz Uckermark*

The most important development of the southern section of BAB 20 was the motorway triangle. Although technically it serves as the starting and ending point of BAB 20 / VDE 10 and therefore should only be a triangle it is named Kreuz (crossing) and is also constructed as a full cloverleaf. In responsibility of Brandenburg the B 166 n was connected to Kreuz Uckermark and now serves as a continuation of BAB 20 to Schwedt. During construction traffic flow on the BAB 11 had to be ensured. The BAB 20 was guided over the existing BAB 11, which in this section was renovated during the construction phase.

**Figure 17: AD Kreuz Uckermark**

(Source: DEGES, 2005, p. 86)

**Figure 18: Map of AD Kreuz Uckermark**




(Source: OSM)

Intermediate travel node

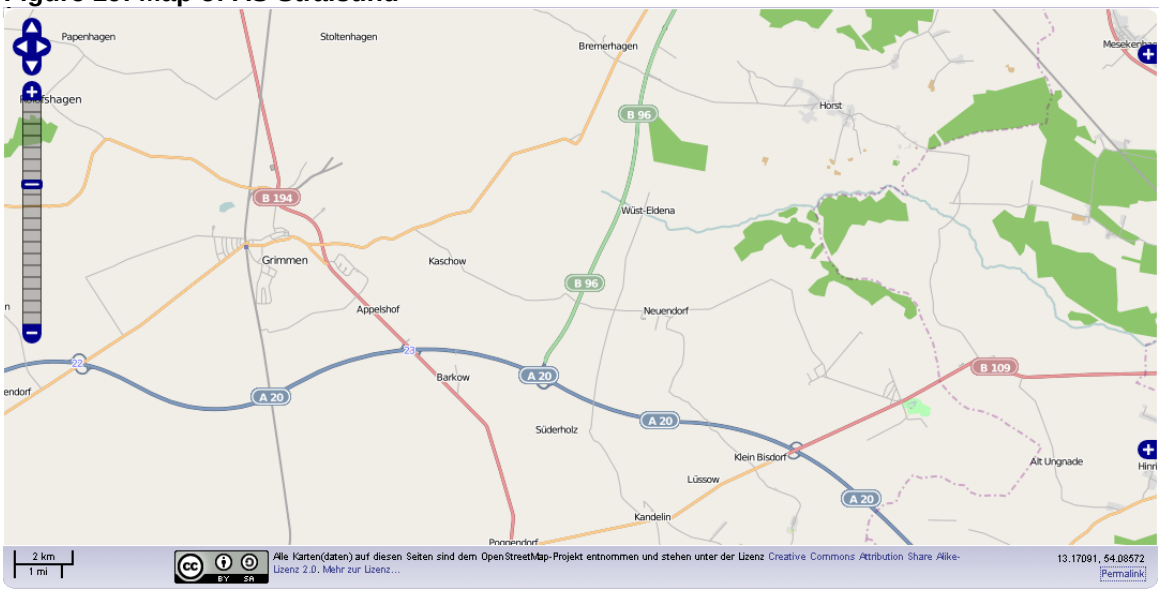
*AS Stralsund*

Although not a motorway interchange, the AS Stralsund has major importance for the greater region as a main node. Firstly it connects the primary centre Stralsund (of about 60,000 inhabitants) to the motorway, and secondly the motorway exit provides a connection to B 96 n, which serves as a feeder road for Rügen. Rügen is the largest German island, has major importance for tourism in the region and on its northeast shore is the deep water harbour of Sasnitz, with ferry lines to Scandinavia, the Baltic States and Russia.

It was constructed as a left hand trumpet (three way interchange) (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 63).

No aerial photo could be found.

**Figure 19: Map of AS Stralsund**




(Source: OSM)

**Project costs**

Construction costs

In spring 1991 the Federal Government enacted the status of acuteness (*vordringlicher Bedarf*) to the VDE projects. Funds were ensured by a separate target ceiling. (DEGES, 2006, p. 8)

Predicted costs in year project gained parliamentary consent against actual costs (to date):

1991 (predicted): DEM 3.19bn EUR 1.63bn GBP1.42bn
(Der Bundesminister für Verkehr, 1992b, p. 35)

2008 (actual): EUR 1.9bn GBP 1.65bn
(Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2008a, p. 18)

Construction costs timeline

1991 (predicted): DEM 3.19bn EUR 1.63bn GBP 1.42bn
(Der Bundesminister für Verkehr, 1992b, p. 35)

2000 (predicted): DEM 3.8bn EUR 1.94bn GBP 1.69bn
(Wirtschaftsministerium Mecklenburg-Vorpommern, 2000, p. 9)

2005 (actual) EUR 1.89bn GBP 1.64bn
(Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p.27)

2006 (actual) EUR 1.6bn GBP 1.39bn
(DEGES, 2006, p. 15)

2007 (actual) EUR 1.83bn GBP 1.59bn
(DEGES, 2007a, p. 10)

2008 (actual): EUR 1.9bn GBP 1.65bn
(Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2008a, p. 18)

Changing currency rates and the impact of inflation or deflation of currencies are not factored. For all calculations: EUR * 0,8493 = GBP (22 June 2009). Calculations from DEM (Deutsche Mark) to EUR (Euro) are based on: DEM / 1,95583 = EUR .

**Main engineering features**

Details of engineering and construction

As there are a total of 105 motorway bridges or viaducts, only the most spectacular are described in detail:

*Wakenitz viadukt*

- Length: 295m;
- Width: 34.45m;
- Steel composite construction;
- Distance between supports: 43.00m - 55.00m - 43.00m – 3 x 40.50m - 32.00m;
- Three metre wide space between the two directional routes (to keep alive vegetation below the bridge);

- Cross section of steel girder: 2m width, 1.5m height;
- Steel girders welded airtight to longitudinal girder (295m);
- Cost: EUR 14m.

(Schäferbauten, n. d. [online]; Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p40f.**;** Structurae, 2009 [online])

*Viaduct Triwalk*

- Length: 395m;
- Width: 2 x 15m;
- Height: 1.25m;
- Clearance: 3m – 8m;
- Prestressed concrete t-beam;
- Incremental launching method;
- Distance between supports: 20.7m + 14x25m + 19.7m;
- Cost: EUR 9.5m.

(Structurae, 2004b [online]; Bundesministerium für Verkehr, Bau und Stadtentwicklung,2005, p49)

*Warnow viaduct*

- Length: 930.1m;
- Width: 2 x 11.82m;
- Height: 1.8m–3.9m;
- Clearance: max 13m;
- Double-webbed prestressed concrete t-beam;
- Formwork carriage (foreshore bridge), cantilever method (main bridge);
- Distance between supports: 20.0m - 2 x 24.6m - 10 x 32.3m - 37.3m - 50.5m - 74.0m - 50.5m - 9 x 32.3m - 26.8m;
- Cost: EUR 24.3m.

(Stritzke, 2000, p5f., Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p56f.; Structurae, 2006 [online])

*Viaduct Peenetal*

- Length: 1110m;
- Width: 23m;
- Height: 1.8m – 3.9m;
- Clearance: max 13m;
- Prestressed concrete (foreshore bridge), composite steel-reinforced concrete (main bridge);
- Incremental launching method (foreshore bridge), cantilever method (main bridge);
- Distance between supports: 32.2m + 2 x 35.0m + 10 x 40.0m + 2 x 38.6m + 2 x 40m + 52.5m + 95.0m + 52.5m + 5 x 42.0m + 39.4m;
- Original Design: EHS beratende Ingenieure für Bauwesen;
- Structural engineering: Dyckerhoff & Widmann AG, Meyer + Schubart;
- Execution of construction work: Dyckerhoff & Widmann AG, Schälerbau Berlin GmbH, Victor Buyck Steel Construction N.V.;
- Cost: EUR 32m.

(Stritzke, 2000, pp6–10; Structurae, 2004a [online]; Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, pp7 –73)

*Viaduct Ueckertal*

- Length: 1182.5m;
- Width: 28.5m;
- Height: 2.2m;
- Clearance: 6m - 16m;
- Double-webbed prestressed concrete t-beam;
- Formwork carriage;
- Distance between supports: 32.5m + 40.0m + 3 x 42.5m + 21 x 45.0m + 37.5m
- Cost: EUR 31.3m.

(Stritzke, 2000, p10ff.; Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p82f.)

Details of main contracts

The Federal Government gave the order to plan and construct the VDEs to the responsible Federal states on its behalf. In Brandenburg and Mecklenburg-Western Pommerania two similar service contracts regulate the transfer of responsibility for planning and construction to DEGES. These contracts detail, amongst other matters, which tasks are to be conducted by DEGES during the preplanning phase and in the plan approval order procedures and how they are to be conducted (Remmert, 2003, pp82-85).

Roadway, civil engineering structures, motorway telecommunication wires, and compensation measures are approved by DEGES. In case 1 the motorway is directly opened after that approval, whereas in case 2 it remains in custody of DEGES (DEGES, n. d., p3f.)

Case 1: Approval by traffic authority to ensure that all traffic signs and other traffic features are positioned properly. This approval should be conducted after roadway, civil engineering structures, motorway telecommunication wires, building constructions, and compensation measures have been approved by DEGES. Additional approval has to be given by the road construction agency according to § 4 FStrG.

Case 2: All civil works which could not be opened immediately after construction, civil engineering structures, motorway telecommunication wires, building constructions, and compensation measures are approved by DEGES. The roadway remains in custody of DEGES, which includes ensuring traffic safety until final opening (DEGES, n. d., p14).

*Wakenitz viadukt*

- Original design: Böger + Jäckle Gesellschaft Beratender Ingenieure mbH & Co. KG;
- Geology: Grundbauingenieure Steinfeld und Partner;
- Counsel architecture: Jux & Partner;
- Execution of construction work: Schäfer-Bauten GmbH.

*Triwalk viaduct*

- Original design: EHS beratende Ingenieure für Bauwesen;
- Structural engineering: Kinkel + Partner;
- Execution of construction work: GERDUM u. BREUER Bauunternehmen GmbH.

*Warnow viaduct*

- Original design: Leonhardt, Andrä und Partner;
- Structural engineering: Kinkel + Partner;
- Execution of construction work: GERDUM u. BREUER Bauunternehmen GmbH.

*Viaduct Peenetal*

- Original design: EHS beratende Ingenieure für Bauwesen;
- Structural engineering: Dyckerhoff & Widmann AG, Meyer + Schubart;
- Execution of construction work: Dyckerhoff & Widmann AG, Schälerbau Berlin GmbH, Victor Buyck Steel Construction N.V.

Main engineering key facts and figures

- Length of motorway: 323km;
- Intersection-free;
- Dual two lane motorway including hard shoulders;
- Cross-section: 29.5m (Lübeck-Rostock); 27m (Rostock – A11);
- 35 motorway exits;
- four motorway interchanges;
- 12 rest areas;
- five petroleum and service stations (two of which are one-directional);
- one tunnel (360m);
- 172 road or rail overbridges;
- 105 motorway bridges or viaducts;
- 989.5km drainage lines;
- 187 rain containment pools;
- 32.84m $m^3$ earth moving.

# D PROJECT TIMELINE

## Project timeline

**Table 4 - Overview project timeline**

| Time | Key Decision/ Event |
|---|---|
| Spring 1991 | Enactment of the status of acuteness (*vordringlicher Bedarf*) to the VDE-projects by the Federal Government. |
| March 1991 | Planning order of the German Federal Ministry of Transport for the Federal states Schleswig-Holstein, Mecklenburg-Western Pommerania and Brandenburg |
| Summer 1991 | Initial start of planning for BAB 20 from BAB 1 to the city of Rostock supported by Road Construction Agency Schleswig-Holstein |
| 16 Dec 1991 | Enactment of Act of the Acceleration of Transport Infrastructure Planning (*VerkPBG*) |
| May 1992 | Acceptance of responsibility for the project (306km in Mecklenburg-Western Pommerania and Brandenburg) by DEGES |
| 19 Dec 1992 | First Groundbreaking near AK Wismar |
| Jan 1994 | Route determination procedure by the Ministry of Transportation for the section Neukloster to the frontier of Mecklenburg-Western Pommerania and Brandenburg |
| May 1994 | Start of construction: Viaduct Triwalk |
| July 1994 | End of Regional Planning Procedure in Mecklenburg-Western Pommerania |
| May 1995 | End of Regional Planning Procedure in Brandenburg |
| July 1995 | Route determination procedure by the Ministry of Transportation for the section BAB 1 to Schönberg |
| Sep 1995 | Route determination procedure by the Ministry of Transportation for the section frontier of Mecklenburg-Western Pommerania and Brandenburg to the three way motorway interchange Uckermark |
| 18 Dec 1995 | First Groundbreaking in Western Pommerania near AS Jarmen |
| Jan 1996 | Completion: Viaduct Triwalk |
| 22 Aug 1997 | Start of construction: Viaduct Warnow, first Groundbreaking |
| 3 Dec 1997 | Opening of VKE between Grevesmühlen and Wismar by Minister of Transport Matthias Wissmann |
| 13 Mar 1998 | Start of construction: traffic part unit Gützkow – Jarmen |
| 19 Jun 1998 | Start of construction: AD Kreuz Uckermark |
| 13 Aug 1998 | First groundbreaking: Viaduct Ueckertal |
| Sep 1998 | Start of construction: AK Rostock |
| July 1999 | Completion: AK Rostock |
| April 2000 | Completion: Viaduct Warnow |
| End 2000 | Opening of 92km traffic part unit between AS Schönberg and AK Rostock |
| End 2001 | Opening of 31km traffic part unit between AS Pasewalk-Nord and AD Kreuz Uckermark |
| 2002 | Opening of traffic part unit between AS Pasewalk-Nord and AS Neubrandenburg-Nord |
| 18 Dec 2001 | Opening of 4.8km traffic part unit between AK Lübeck and AS Genin |
| 12 Aug 2002 | Opening of traffic part unit Gützkow – Jarmen |

| | |
|---|---|
| 17 Sep 2003 | Opening of traffic part unit Tessin – Tribsees |
| 14 Dec 2004 | Opening of traffic part unit between AS Genin and AS Schönerg; gap filling between Schleswig-Holstein and Mecklenburg-Western Pommerania |
| 18 Nov 2005 | Opening of traffic part unit between AS Anklam and AS Neubrandenburg-Nord AS |
| 07 Dec 2005 | Opening of traffic part units between Langsdorf/Tribsee s and AS Grimmen-West and AS Greifswald and Gützkow; Completion of the whole motorway; Opening ceremony in Tribsees with Chancellor Angela Merkel, Minister of Transportation Wolfgang Tiefensee, Prime Minister of Schleswig-Holstein Peter-Harry Carstensen, and Prime Minister of Mecklenburg-Western Pommerania Harald Ringstorff |

(Source: Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p. 19; NDR Online, 2005 [online])

**Project timeline key issues**

In spring 1991 the Federal Government enacted the status of acuteness (*vordringlicher Bedarf*) to the VDE projects. Funds were ensured by a separate target ceiling. Furthermore the Federal Government enacted the Act of the Acceleration of Transport Infrastructure Planning (*VerkPBG*) on 16 December 1991. This aims to ensure efficient planning and approval timelines by considering the special circumstances in the new Federal states. Its specifics are:

- Shortening of the time frames for acting by public authorities;
- The Federal Administrative Court (*Bundesverwaltungsgericht*) is the first and last level of jurisdiction;
- The possibility for instant implementation of plan-approval orders;
- The possibility to instruct representatives for unknown landowners.

(DEGES, 2006, p8).

# E PROJECT FUNDING

## Introduction

Since all motorways in Germany are completely owned by the Federal Government and operated by the Federal states, there is no private investment apparent in planning and/or construction. Exceptions to this are new construction of bridges, tunnels or mountain passes. These can be realised with private funds (construction, maintenance, operating, and financing) and after construction the right to impose a toll is given to the private carriers (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2009c [online]). There are plans to change this situation in the future, but they are still in an argumentative status and are being heavily discussed.

## Background to funding

The entire funding of VDEs and the BAB 20 is derived from public sources, generally from the Federal Government Ministry of Transportation. A small amount of funding is derived from European Union sources. The European Regional Development Fund (ERDF) and its transport policy were employed to finance parts of the BAB 20. From motorway exit Grimmen/Ost to motorway exit Strasburg (both in Meckelnburg-Western Pommerania) the European Union contributed EUR 26m of a total of EUR 374m (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2009b [online]).

Revenue

In 1996 DEGES estimated the positive regional effects of A20 during its operations phase as DEM 217m (around EUR 110m) per year (DEGES, 1996, p15). However, it is not mentioned how this estimation has been averaged.

The only fixed revenues are the leases of the carriers of service and petroleum stations. No numbers could be identified. No toll is imposed on private cars. As on all motorways in Germany, a toll for trucks (heavier than 12 tons) is imposed by 'Toll Collect'. These toll revenues from all motorways are used to finance traffic infrastructural improvements, mainly on trunk roads (Bundesministerium für Verkehr, Bau und Stadtentwicklung 2009c [online]). No information is available about toll revenues of individual motorways.

Prediction of funding costs

1991 (predicted): DEM 3.19bn EUR 1.63bn GBP 1.42bn
(Der Bundesminister für Verkehr, 1992b, p35)

2000 (predicted): DEM 3.8bn EUR 1.94bn GBP 1.69bn
(Wirtschaftsministerium Mecklenburg-Vorpommern, 2000, p9)

Changing currency rates and the impact of inflation or deflation of currencies are not factored. For all calculations: EUR * 0.8493 = GBP (22 June 2009). Conversions from DEM (Deutsche Mark) to EUR (Euro) are based on DEM / 1.95583 = EUR.

Funding key stages

In spring 1991 the Federal Government enacted the status of acuteness (*vordringlicher Bedarf*) to the VDE-projects. [Federal] funds were ensured by a separate target ceiling.

DEGES got an annual budget bankrolled, together with commitment authorisations for the following years (DEGES, 2006, p8).

**Traffic Forecasts**

All traffic forecasts are predicted for 2010 and are valid for all vehicles (cars, trucks and coaches):

1992: around 40,000 vehicles per 24 hours between AK Lübeck and AK Wismar;
around 60,000 vehicles per 24 hours between AK Wismar and AK Rostock;
around 18,000 vehicles per 24 hours between AK Rostock and AD Uckermark;

(Der Bundesminister für Verkehr, 1992b, p35)

around 50,000 vehicles per 24 hours between AK Lübeck and AK Rostock;
around 25,000 vehicles per 24 hours between AK Rostock and AD Uckermark;

(Deutscher Bundestag, 2006, p2)

1994: 29,000 vehicles per 24 hours between Strasburg and AD Uckermark;

(DEGES, 1994, p3)

1996: average 33,000 vehicles per 24 hours on the whole motorway;
around 50,000 vehicles per 24 hours between Neukloster and AK Rostock;
around 65,000 vehicles per 24 hours peak-period demand in the greater area of Rostock;
around 40,000 vehicles per 24 hours between AK Rostock and AS Stralsund;
around 30,000 vehicles per 24 hours between AS Stralsund and AD Uckermark;

(DEGES, 1996, p7f.)

2005: average 30,000 vehicles per 24 hours on the whole motorway;
around 50,000 vehicles per 24 hours between Neukloster and AK Rostock;
up to 65,000 vehicles per 24 hours peak-period demand in the greater area of Rostock;
more than 40,000 vehicles per 24 hours between AK Rostock and AS Stralsund.

(Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2005, p26f)

There are no appropriate data available pointing out the direct effects of traffic forecasts on the amount of funding for the project. For actual/reported traffic volume, see 'Reported traffic volume' below.

**Funding sources**

Federal Government: EUR 1.9bn (highest statement of governmental sources, see Construction Costs Timeline).

European Union (European Regional Development Fund): EUR 26m.

**Commentary on financing/ funding**

As all motorways in Germany are owned entirely by the Federal Government and operated by the Federal States with Federal Government financing, there is no private investment apparent in their planning and/or construction. Exceptions to this are the new construction of bridges, tunnels or mountain passes. These can be realised with private funds (construction, maintenance, operating, and financing) and after construction the right to impose a toll is given to the private carriers (Bundesministerium für Verkehr, Bau und Stadtentwicklung, 2009c [online]). There are plans to change this situation in the future, but they are still in an argumentative status and are being heavily discussed. There are major differences between federal motorways and federal highways concerning private financing and funding, and differences between federal trunk roads (in general) and state and local roads.

European Union funding is commonly used: however, the share of European financing is comparatively quite low. The major associated development 'B 96 n Connection Stralsund / Rügen (B 96 n Zubringer Stralsund / Rügen)' was partly financed by European funding.

## F OPERATIONS

### Reported traffic volume

**Table 5 – Reported traffic volume 2005 - 2007**

| Year | Name of census point | Next exit / intersection (not included in original tables) | Section (not included in original tables) | Vehicles 24 h | Annual percentage change | Trucks 24 h | Truck share (%) | annual percentage change |
|---|---|---|---|---|---|---|---|---|
| 2005 | Neddelstenhof | AK Lübeck | AK Lübeck – frontier | 33,264 | x | 3,109 | 9,3 | x |
| 2005 | Upahl | AS Grevesmühlen | frontier – AK Wismar | 23,796 | x | 2,392 | 10,1 | x |
| 2005 | Satow | AS Kröpelin | AK Wismar – AK Rostock | 26,773 | x | 2,426 | 9,1 | x |
| 2005 | Tessin | AS Tessin | AK Rostock – AS Gützkow | 10,921 | x | 742 | 6,8 | x |
| 2005 | Strasburg | AS Strasburg | AS Gützkow – ADUckermark | 8,387 | x | 628 | 7,5 | x |
| (Bundesanstalt für Straßenwesen, 2007, pp115, 217) | | | | | | | | |
| 2006 | Neddelstenhof | AK Lübeck | AK Lübeck - Landesgrenze MV | 37,730 | 13.4 | 4,026 | 10,7 | 29.5 |
| 2006 | Upahl | AS Grevesmühlen | Landesgrenze - Wismar | 26,572 | 11.7 | 2,936 | 11 | 22.7 |
| 2006 | Satow | AS Kröpelin | Wismar - Rostock | 29,328 | 9.5 | 2,783 | 9,5 | 14.7 |
| 2006 | Tessin | AS Tessin | Rostock - Gützkow | 15,325 | 40.3 | 1,356 | 8,8 | 82.7 |
| 2006 | Strasburg | AS Strasburg | Gützkow - Uckermark | 11,870 | 41.5 | 1,112 | 9,4 | 76.9 |
| (Bundesanstalt für Straßenwesen, 2008, pp118 f., 219) | | | | | | | | |
| 2007 | Neddelstehof | AK Lübeck | AK Lübeck - Landesgrenze MV | 39,988 | 6 | 4,296 | 10,7 | 6.7 |
| 2007 | Upahl | AS Grevesmühlen | Landesgrenze - Wismar | 28,015 | 5.4 | 3,206 | 11,4 | 9.2 |
| 2007 | Satow | AS Kröpelin | Wismar - Rostock | 30,339 | 3.4 | 3,107 | 10,2 | 11.7 |
| 2007 | Tessin | AS Tessin | Rostock - Gützkow | 16,555 | 8 | 1,554 | 9,4 | 14.6 |
| 2007 | Strasburg | AS Strasburg | Gützkow - Uckermark | 12,438 | 4.8 | 1,262 | 10,1 | 13.5 |
| (Bundesanstalt für Straßenwesen, 2009, pp118 f., 220) | | | | | | | | |

‘Vehicles’ include motorbikes, passenger cars, trucks and coaches;
‘Trucks’ include coaches.

Traffic census 2006:

- around 35,000 vehicles per 24 hours between AK Lübeck and AK Rostock;
- around 19,000 vehicles per 24 hours between AK Rostock and AD Uckermark;

that means:

- around 70% of predicted traffic volume (1992) between AK Lübeck and AK Rostock;
- around 76% of predicted traffic volume (1992) between AK Rostock and AD Uckermark.

(Deutscher Bundestag, 2006, p. 2)

**How traffic forecasts were formulated**

Traffic forecasts were formulated relatively vaguely on the basis of guidelines according to *Bundesverkehrwegeplan* 1992 for the year 2010.

Actual traffic reports for the motorway did not exist or were not published until 2005. At the end of 2005 the completed motorway was opened. Presumably this is the reason for the relatively high growth rates between 2005 and 2006.

The cited traffic census of 2006 was the answer to a Federal parliament interpellation. It was not published separately.

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**Open Street Map (permalinks):**

AD Kreuz Uckermark:
http://www.openstreetmap.de/karte.html?zoom=12&lat=53.27275&lon=14.00694&layers=B0
AK Lübeck:
http://www.openstreetmap.de/karte.html?zoom=13&lat=53.85143&lon=10.59792&layers=B0

AK Rostock:
http://www.openstreetmap.de/karte.html?zoom=12&lat=54.0553&lon=12.19759&layers=B0
AK Wismar:
http://www.openstreetmap.de/karte.html?zoom=13&lat=53.8801&lon=11.52051&layers=B0
AS Stralsund:
http://www.openstreetmap.de/karte.html?zoom=12&lat=54.10444&lon=13.14138&layers=B0

## H GLOSSARY

| English | German | German abbreviation |
|---|---|---|
| Accompanying landscape conservation plan | Landschaftspflegerischer Begleitplan | LBP |
| Act of the Acceleration of Transport Infrastructure Planning | Verkehrswegeplannungsbeschleunigungs-gesetz | VerkPBG |
| Basic Constitutional Law of the Federal Republic of Germany | Grundgesetz der Bundesrepublik Deutschland | GG |
| Citizens' initiative | Bürgerinititaive | BI |
| Federal Administrative Court | Bundesverwaltungsgericht | BVerwG |
| Federal Government | Bundesregierung | |
| Federal Highway | Bundesstraße | B |
| Federal Highways Act | Bundesfernstraßengesetz | BFStrG, |
| Federal motorway | Bundesautobahn | BAB, A |
| Federal road construction Agency | Bundesstraßenbauverwaltung | |
| Federal transport network plan | Bundesverkehrswegeplan | |
| German Unity Arterial road planning and construction company | Deutsche Einheit Fernstraßenplanungs- und Baugesellschaft mbH | DEGES |
| German Unity Transport Project | Verkehrsprojekt Deutsche Einheit | VDE |
| Implementation planning | Ausführungsplanung | |
| Land consolidation procedure | Flurbereinigungsverfahren | |
| Motorway exit | Autobahnanschlußstelle | AS |
| Motorway interchange | Autobahnkreuz | AK |
| Motorway surveillance centre | Autobahnmeisterei | |
| Pilot survey | Voruntersuchung | |
| Plan-approval order | Planfeststellungsbeschluß | |
| Plan-approval procedure | Planfeststellungsverfahren | |
| Regional masterplan of routing | Raumgeordnete Trasse | |
| Regional planning procedure | Raumordnungsverfahren | ROV |
| Road surveillance centre | Straßenmeisterei | |
| Route determination procedure | Linienbestimmungsverfahren | |
| State highway | Landesstraße | L |
| Three way motorway interchange | Autobahndreieck | AD |
| Traffic part unit | Verkehrseinheiten | VKE |