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Case Study: Infrastructure Funding in Germany

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Case Study Report - Infrastructure Funding in Germany

Institutional / Planning Structure

The responsibilities for transport planning and transport investment decisions in Germany are described in the following as an example for infrastructure funding in a cooperative federal system. As a federally organised nation Germany has a vertically tiered system of responsibilities. The legislative, executive and jurisdictional powers are separated between the federal level (Bund), the federal states (Bundesländer), and communities (Gemeinden).

The division of responsibilities between the federal and state level follows two principles: firstly the principle of subsidiarity, meaning that decisions are generally taken on a decentralised basis, with federal competences defined in the constitution. The second important principle is that of a cooperative federalism or division of power in contrast to a separation of powers (as e.g. in the USA). In the cooperative system, a major part of legislation is decided on the federal level, while the states are responsible for the implementation. The legislative power of the German federal government can either be executive, where the states only get legislative power if federal law explicitly authorizes them (Basic Law / "Grundgesetz" GG Art.71), or competing with the federal states being authorized for legislation as long as the federal level does not make use of its legislation rights (GG Art. 72). The reduced self-determination of states in the cooperative system is compensated by strong participatory rights in federal decision-making (Börzel, 2002). Thus, in all matters of the Federation that concern the states' interests, the states participate in the federal legislation and administration through the Bundesrat, the Federal Council / Upper House of Parliament (GG Art. 50) and representation of the federal states in the German federal system.

The relationship amongst the federal states in Germany is also determined by the cooperative federalism with the states aiming at a coordination of politics on several levels, e.g. in the Bundesrat and its committees as well as other joint boards. For transport policy the most important committees for coordinating decisions on the state level are the Committee on Transport of the Bundesrat (Verkehrsausschuss des Bundesrats) and the Conference of Ministers of Transport (VMK - Verkehrsministerkonferenz). The federal Ministry of Transport, Housing and Building (BMVBW) is invited as a guest to the VMK. Its meetings and decisions are prepared by the Conference of Heads of Transport Departments (VALK) and the Conference of Heads of Department for Road Construction (LKS) from the states. Besides, five state working groups (e.g. on rail transport or on the Federal Transport Infrastructure Plan) and joint federal-state committees provide input for the VALK and LKS.

This system of cooperative federalism is mirrored in the system of transport planning and investment decisions in Germany. The federal level is generally responsible for planning, construction, maintenance and operation of federal roads and trunk roads (Bundesfernstraßen: Autobahnen and Bundesstraßen), federal railways (Deutsche Bahn Netz AG as part of Deutsche Bahn AG), and inland waterways. Airports and sea ports fall under the responsibility of the states, with their connection to the surface transport modes covered on the federal level. The main instrument of federal infrastructure planning is the federal infrastructure master plan, identifying the need for federal transport infrastructure projects and corresponding lists of projects (development acts) as part of federal legislation (Fernstraßenausbaugesetz etc.). A comprehensive overview of the national infrastructure planning process of Germany can be found in Rothengatter (2005a). Figure 1 provides an overview of the political process and the role of the planning bodies in this process. The transport master plan contains a list of priority projects for investments, ranked according to the results of a project appraisal comprising a monetary cost-benefit analysis, an environmental risk assessment and a spatial development assessment plus some additional political criteria such as European interconnectivity or intermodal integration. Additionally, a quota system is applied to provide for a fair distribution of investments between the states. The states among other bodies have the right to apply for funding and issue lists of potential projects as an input to the transport master planning process, and they are consulted in the

planning process after the project appraisal has been carried out and a first draft of priority lists for transport infrastructure investments has been developed by the Ministry of Transport.

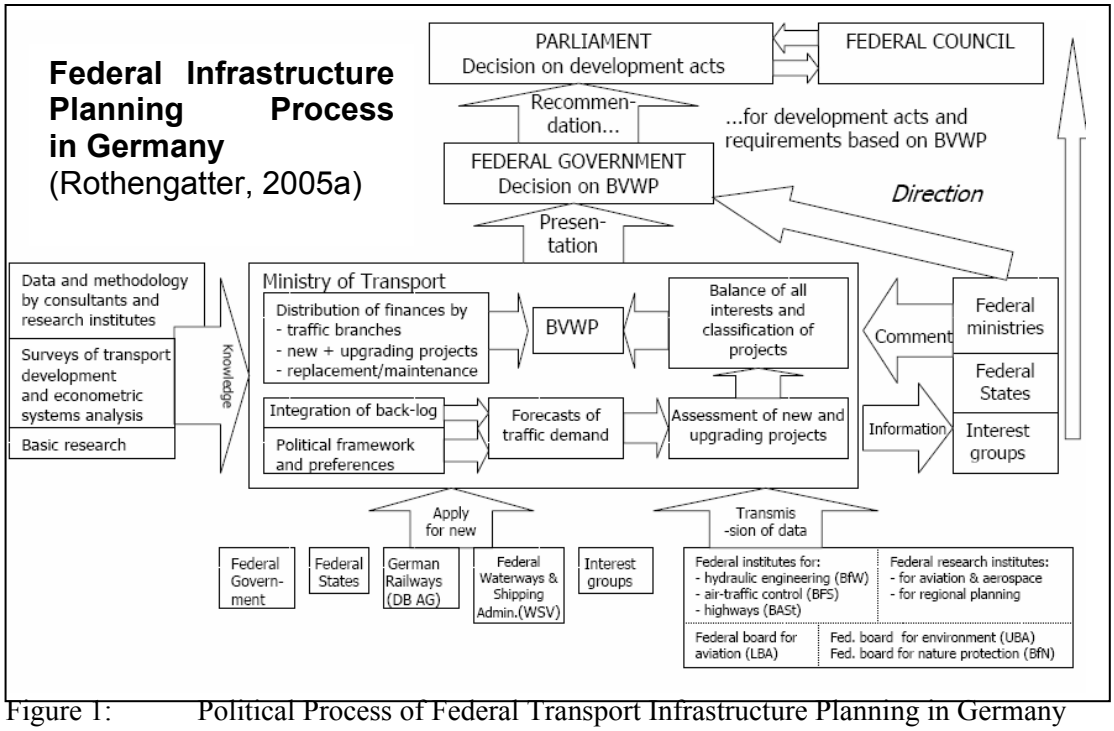

Figure 1: Political Process of Federal Transport Infrastructure Planning in Germany
(Source: Rothengatter, 2005a, p. 37)

Investment Figures

Besides the 2003 federal *transport master plan* with a total volume of 150 billion € for the time period 2001-2015, there have been several national initiatives for investments into the transport infrastructure. One of the largest of these, the 1999 *"Investments for the Future" programme* (Zukunftsinvestitionsprogramm) was set up from funds generated through the selling auction of UMTS licenses. It contained investments into road (7.1 billion €), rail (7.5 billion €) and waterways (1.3 billion €) for the period 2001-2003. Due to the short time scale and the public accounting system which does not allow transferring funds into following years, however, it was difficult for the administrative authorities and the German railways to actually spend the funds in time. Germany additionally receives funding from the European Fund for Regional Development for infrastructure investments in the new federal states in eastern Germany. In 2005, the Federal Government decided to provide an additional sum of 2 billion Euros for the period 2005 - 2008 for the improvement of transport infrastructure as part of their reform agenda for Germany (Agenda 2010). The projects that can be supported are taken out of the portfolio of the general master plan. Thus, these investments intend to accelerate the completion of priority projects. The funds are managed through the newly formed infrastructure financing agency (Verkehrsinfrastrukturfinanzierungsgesellschaft VFIG) which allows for more flexibility in the horizontal and temporal allocation of funds.

Responsibilities and Funding of Road Infrastructure

While the overall responsibility lies with the federal level, the states administer the federal roads, i.e. they carry out the project planning, construction and operation on behalf of the federal level through their administrative bodies. The federal level retains the authority to control and issue instructions to the states and has the financial sovereignty in the investment decisions. Figure 2 depicts the general division of responsibilities in road planning and construction in Germany. Besides the federal roads, the states also plan and operate state (trunk roads) (Landesstraßen) within their own jurisdiction in consultation with the regional level and other stakeholders.

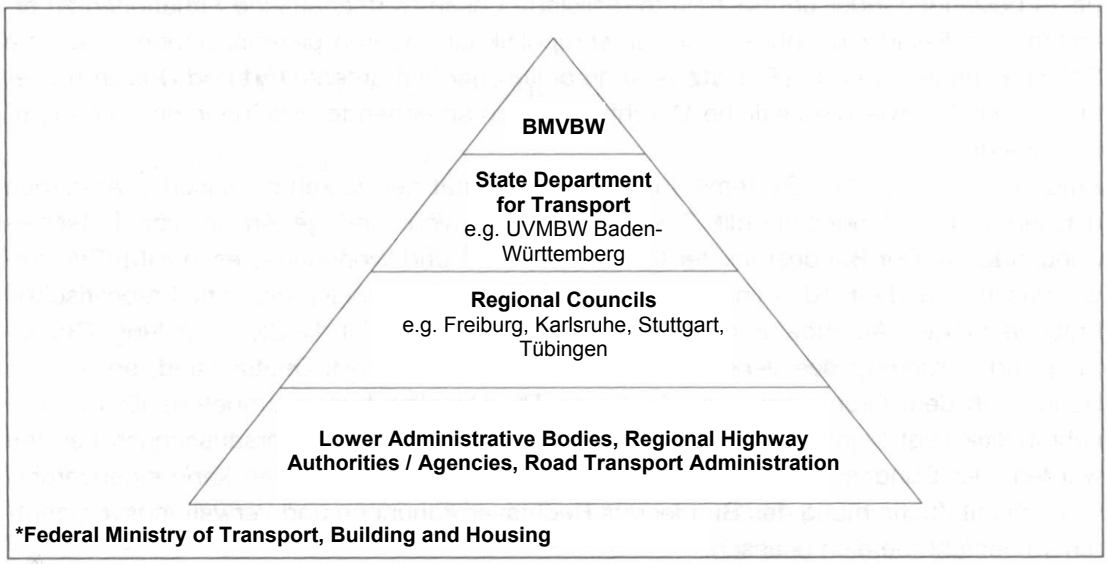

Figure 2: The "Pyramid of Authorities" - General division of responsibilities between authorities for road planning and construction in Germany (Source: Grandjot, 2002, translated)

Beckers et al. (2005) state in their analysis of the German Motorway procurement system a shortage of investments as a result of tight public budgets, inefficiencies of resource allocation due to the quota system in the project selection, delayed planning processes because of the administrative setup between federal and state tiers, and inefficiencies in the planning and construction processes. The division of power between federal level and states for the procurement of federal roads has been further analysed by the President of the Auditor General's Office in Germany with respect to its economic efficiency (Engels, 2004). The conclusion of the report is that there are growing problems in particular regarding two issues: Firstly, the system of federal roads was originally designed for long-distance traffic but carries a considerable amount of regional traffic today, specifically on the highways. Besides, many highways have been converted by the states to federal roads which allowed them to claim federal funding. In the planning process, the bottom-up procedure leads to inefficiencies due to the assessment of more than 1500 single projects which are proposed by the different bodies. Proposals have been made to substitute this by a more strategic approach focussing on the federal planning objectives (see e.g. Wissenchaftlicher Beirat, 2000, Gühnemann et al., 1999, pp. 364-367). Secondly, since the road administration and thus, considerable decision making power on many aspects of the road procurement is carried out on the state level on behalf of the federal government, the federal level lacks information and control over the efficiency of the process. Therefore, Engels (2004) proposes that all federal trunk roads be transferred to the full responsibility of the states and that a federal road administration be established with responsibility for the motorways which would remain a federal liability.

Also, from a distributional point of view, the procurement of motorways in the Federal States doesn't always seem to follow clear rules, rather political power and priorities, as figure 3 indicates. Part of differences can be explained by size and population densities: small and densely populated states such as the cities of Hamburg and Bremen tend to have denser federal road networks while the per-capita provision is higher in large states such as Bayern or Niedersachsen. Some outliers can be explained by negative demographic development and regional development objectives in the new federal states after unification (Mecklenburg-Vorpommern, Brandenburg). However, there are unexplainable exemptions such as a very low density of federal roads in the capital city of Berlin and comparably high per-capita provisions in Saarland. Clear investment rules and classification of roads according to their importance for federal interest could overcome part of the discrepancies. Another lesson learnt in the case of the new federal states in Eastern Germany is that infrastructure provision alone is not a suitable instrument for regional development and these investments need to be considered very carefully from an efficiency point of view.

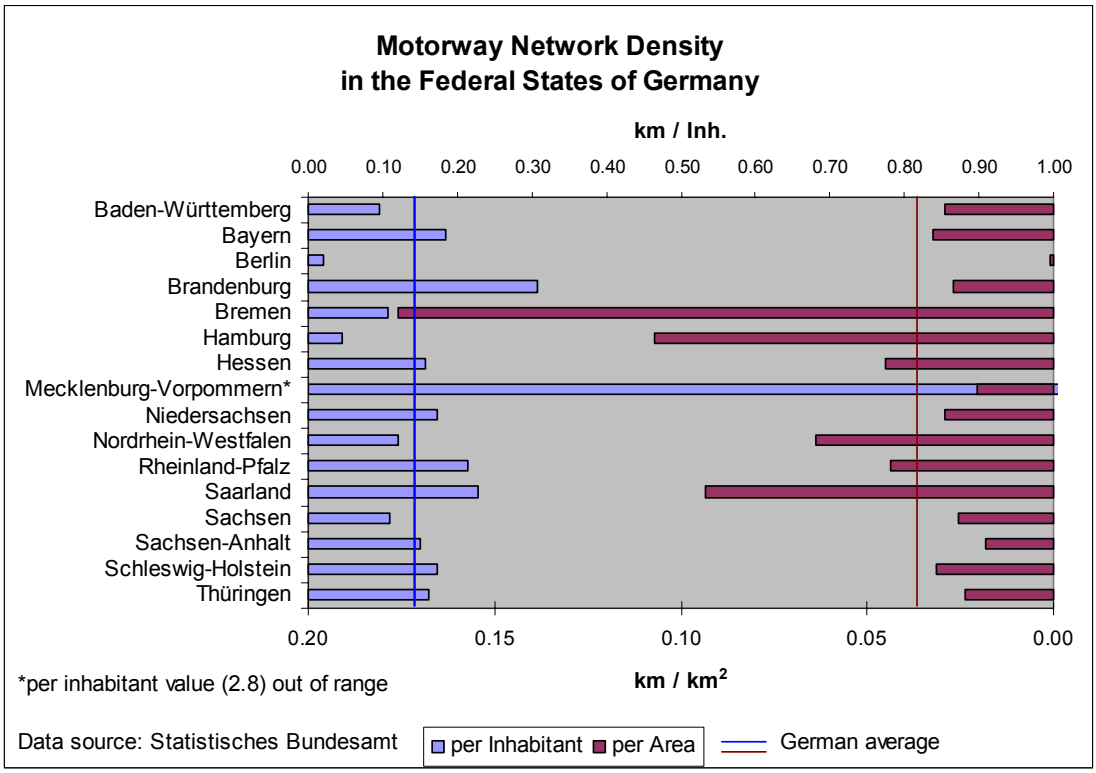

Figure 3: Motorway Network Density in the Federal States of Germany

The co-ordination of investment decisions between states is organised via several committees, e.g. on the highest political level the Conference of Ministers of Transport (VMK - Verkehrsministerkonferenz), and joint working groups at lower decision levels. However, investments into the transport infrastructure are not always synchronised, and special problems arise in cross-national planning when a similar number of actors can be involved from a second country, leading to lengthy planning processes (see e.g. Fabian, 2005).

Responsibilities and Funding of Rail Infrastructure

In the case of national railway infrastructure projects, investments have to be agreed between the Federal government and the infrastructure company of the German railways, the DB Netz AG. The DB Netz AG has been formed after the Railway Reform of 1994 and is part of the DB AG holding (German railways), which is still 100% state owned but operates as a public limited company. As a general rule, the federal government funds infrastructure construction costs for priority projects included in the transport master plan as an interest free loan for which the network company has to back the annual depreciation. The share of the state contribution to the construction is negotiated between the company and the federal government with a possible elimination of projects if negotiations fail. The project implementation then lies with the DB Netz AG. As a consequence of heavy cost overruns on some projects, subsequent financial problems of the company and reduced maintenance of the existing network which lead to considerable problems with the reliability of rail services, also part of the reinvestment is paid for by the government (Rothengatter, 2005b). Overall, the efficiency of investments has improved due to the profitability interest of the DB AG (KCW et al., 2005). A major point of criticism is the vertical integration of the track and train operating companies under the auspices of the DB AG, introducing a discrimination potential in favour of investment decisions which would primarily benefit DB AG transport services. Moreover, the integration is regarded particularly critical in connection with a potential stock market flotation[1] of the integrated DB AG with regard to its impact on network maintenance and competition as well as distributional effects (see e.g. KCW et. al, 2005).

[1] This flotation is under consideration, the federal government is still in the consultation process, and a study comparing different alternatives has just been published (Booz Allen Hamilton, 2006)

Regional railway services have been the responsibility of the federal states since regionalisation in 1996. Services have to be announced by invitation to tender, which has led to a considerable increase in competition and transport volume in that market. For the network company of the DB AG the policy of the federal states plays an important role in their appraisal of the profitability of future investments. In order to avoid sunk costs by federal states deciding to terminate the subsidisation of services on certain routes and subsequent loss of track charges, the DB AG requested "infrastructure securing contracts" with the federal states, securing the provision of services and funding of reinvestments (see Booz Allen Hamilton, 2006).

Responsibilities and Funding of Inland Waterways and Airports

Investments into **inland waterways** are entirely the responsibility of the federal level, which is also in charge of their administration. Because of their high ecological risk, all inland waterway projects have to undergo a separate environmental assessment before being included into the master plan. Due to a stagnating demand, high investment costs and environmental concerns, only few projects are planned, most funds are made available for reinvestment.

Unlike several other countries in the European Union with national airport ownership and airport groups, **airports** in Germany are owned and regulated by the federal states and local communities (some prominent exceptions with part privatisation are Hamburg, Frankfurt, Düsseldorf, Hannover, Terminal 2 in Munich) (von Hirschhausen, 2004). Planning and funding of these airports is therefore the responsibility of the states. The federal government, however, is on the one hand involved as a shareholder in a few airport companies and, on the other hand, is responsible for some general regulation issues. Presently there is a strong involvement of local communities to expand many regional airports following the successful example of Hahn airport which grew rapidly with the presence of the low-cost airline Ryanair. However, Heymann and Vollenkemper (2005) come to the conclusion that most regional airports will lack the critical mass to become profitable and will therefore swallow up subsidies in competition to attract airlines. From an economic point of view, investments into the larger airports that are operating at capacity limits is more efficient, but a general coherent investment strategy is made difficult by conflicting regional interests in the current decentralised system. The federal government developed such a integrated airport concept - including necessary inter-modal interchanges - for the first time in the year 2000 for consultation with the federal states which has not yet been proceeded further.

The Transport Infrastructure Financing Agency

Motivated by the results of a High-Level Commission ("Pällmann-Kommission") on future financing of transport infrastructures, a multi-modal **transport infrastructure financing agency** (VFIG, Verkehrsinfrastrukturfinanzierungsgesellschaft) was established based on the „Verkehrsinfrastrukturfinanzierungsgesellschaftsgesetzes" (VIFGG) (transport infrastructure financing agency law) in 2003, going into operation in 2004. It is completely owned by the federal government and presently managed by civil servants from the ministry of transport. The major motivation for founding the VFIG was to create the institutional structures enabling and supporting transport infrastructure investments outside the general public budget and public accounting system. Its tasks are the financing and financial management of those aspects of the construction, maintenance and operation of transport infrastructure that are the responsibility of the federal level and the preparation and carrying out of PPP projects (A and F models, see below). One of the major advantages of the agency is that it is not bound by the public accounting system and has therefore more flexibility in transferring funds temporally and between investment activities. Secondly, a more transparent connection between user charges and investments into the infrastructure should be established. However, user charges from the HGV toll on motorways and inland waterway tolls are still collected by federal institutions and the VFIG receives these charges indirectly through the general federal budget. Therefore, three major issues are the subject of current debate (e.g. BDI, 2005):

- the multi-modal character of the agency, allowing for transfers between modes according to political willpower, reducing public acceptance of user charging;
- whether the agency should be allowed to be able to retrieve money from the capital market to raise funds; this issue is to be examined according to the coalition contract of the current government (CDU et al., 2005)
- whether user charges should be earmarked and transferred directly and without being passed through the federal budget to the agency.

However, since the HGV toll as one of the major sources of refunding is only operational since 2005, there is yet little empirical evidence to assess the performance of the agency.

Fund raising methods

General public budgets are the main source of funding for transport infrastructure procurement in Germany. This means that on the one hand most investments are funded through the public budgets, but also that on the other hand user contributions such as vehicle taxes and mineral oil taxes are generally not earmarked for use in the transport sector. However, there are several new financing instruments that have emerged in recent years which are closer to user funding.

In the case of federal **roads**, there are three sources of funding: the public budget, the motorway tolling for heavy goods vehicles (HGV), and PPP (private-public-partnership) models. The public budget is fed by general taxation, including taxes raised from the road transport users, in particular fuel taxes and VAT on fuel. While the latter two taxes are federal taxes, the circulation tax is passed on to the federal states. In the 1960s, a federal road financing law was introduced with particular focus on the extension of the motorway system, requiring that a fixed part of the fuel tax base of that year, and by subsequent laws also of following fuel tax increases, is earmarked for the purposes of the road system. However, this requirement has been broadened annually since 1973 by budget laws to wider transport system uses, and tax increases in recent years have not been earmarked. Moreover, for several years now, due to the financial situation of the country, the amount of infrastructure investment has almost equalled Germany's federal credits to finance the additional yearly debt (Rothengatter, 2005b).

Hence, following the recommendations of the "Pällmann"-Commission in order to sustain transport investments in the long term, new instruments to gradually switch towards the user-pays principle, the HGV motorway toll and two PPP models, have been introduced. The distance based HGV toll replaced a time based Euro-vignette scheme and should have been started in 2003. The toll is collected by means of an automatic, satellite navigation and mobile communications based system. Due to technical problems with this new type of system, the actual start was postponed until the beginning of 2005 leading to substantial decreases in revenues that had been foreseen for infrastructure investments.

Since 1.1.2005 the heavy goods vehicles with a maximum permissible weight of at least 12 tons are charged the HGV toll on the federal motorways. The average toll rate is 12.4 Eurocents per kilometre, differentiated according to axles and emission classes. The basic rate has been determined based on the motorway renewal costs that are caused by HGV. These had been estimated in a study by Prognos and IWW (2002) to add up to 3.4 billion Euros in 2003 and an average of 15 Eurocents per kilometre driven. The rate has been temporarily reduced to decrease the additional burden on the freight transport sector, after a compensation scheme for German forwarders was rejected by the European Commission. The charge is raised by means of a satellite based automated toll collection system which measures the exact number of kilometres driven based on transmitted GPS positioning data of the HGVs. The system is operated by a private sector company – Toll Collect – a joint daughter of Deutsche Telekom AG and DaimlerChrysler AG. The gross toll revenue for 2005 is estimated to reach 3 billion Euros in 2005; by the end of August 1.9 billion Euros had been collected (Törkel, 2005).

According to initial experiences with the HGV-toll in Germany, the system is reported to work reliably,[2] and has a high rate of compliance (Ruidisch et al., 2005) Results of an analysis of the diversion impacts have not been available at the time of this report.
One major criticism of the German system is its high operating costs. Furthermore, although one of the basic demands of the "Pällmann"-Commission was to earmark the revenues from the HGV toll on motorways for infrastructure investments into the motorways, the federal government decided to take a multi-modal view and earmark the net revenues for transport infrastructure improvements with the larger share to be used for the road networks. It is fully transferred to the VFIG via the federal public budget.
A third source of funds for road infrastructure investments are the two PPP schemes: the so-called F- and A-models. The F-model is intended to allow private investments in special infrastructure sections such as tunnels and bridges. It foresees that construction, maintenance and operation plus financing are carried out through a private operator, whose sources of remuneration are direct tolls. Subsidies can be granted up to 20% of the building costs. From 10 projects listed as potential candidates, only one F-model project has been realised (so far financially unsuccessful), a second one is close to completion, and four more are in the planning process. The A-model has been developed to facilitate private investments into the extension of motorways from 4 to 6 lanes, where the construction, maintenance, operation and financing is provided by the private operator who in turn is rewarded revenues from the HGV-motorway toll as a shadow toll. Since the expectation is that about half of the costs can be recovered through revenues, a subsidy of up to 50% for the construction costs can be granted. Five of these projects are currently in the tendering process. One of the major responsibilities of the new VIFG is to take over responsibilities in the preparation and execution of these PPP projects. Overall, there is little experience of these models as yet and hence they cannot be fully evaluated. However, it is expected that both kinds of models have only very limited potential for generating additional funding for road infrastructure in Germany (see e.g. Beckers et al., 2005, Rothengatter, 2005b).
Refunding of **federal rail** infrastructure investments is achieved both through user charges and through public budgets. The track charging system of the DB Netz AG consists of three components: a basic track charge, a product factor and special factors. The basic charge is varied by multiplying with the product factor to distinguish between the qualities of the track. For high demand tracks a surplus of 20% is applied to redirect traffic to less congested tracks. Special factors are e.g. steam trains. In low demand areas regional factors increase track charges in order to improve the cost/revenue ratio. This price differentiation has been strongly criticised by the regions as a source of potential discrimination. These track charges are supposed to allow DB Netz AG to recover the annual depreciation of infrastructure investments. However, there is still strong public sector involvement in the rail sector: indirectly through the track charges of subsidised regional rail services (Regionalisierungsmittel) and directly through financial grants towards construction costs and to cover losses of DB Netz AG (see above). As compensation for the regionalisation of railway services, a fixed amount of funds is transferred from the federal general budget to the states (2002: 6.745 billion Euros; increased by 1.5% p.a. from 2003 on). KCW et al. (2005) estimate the subsidisation of the DB AG from state budgets at around 10 bill Euro with a total revenue of DB AG of 16 billion Euro in 2004 (62% state subsidies, investments and operation). Similarly the Scientific Advisory Board to the Ministry of Transport cites that DB AG has recorded revenues from track charges and fees of about 3 billion Euro (including the subsidised regional services) and estimating a gap in the cost recovery of 2.5 billion Euro which DB AG demands as state contribution (45%) (Wissenschaftlicher Beirat, 2005).
On the **state and community level**, the major sources of funding transport infrastructure investments are public budgets. The states receive major parts of their budget through tax transfers from the federal institutions. For example, vehicle taxes and part of the VAT are redistributed based on fixed shares to the states and communities. In addition, a fixed budget

[2] in the reduced version of 2005; the full functionality is only operational since 01.01.2006

of € 1.67 billion is provided from the federal level for the improvement of transport conditions on the community level, of which 0.22% can be used by the federal level for research purposes according to the Gemeindeverkehrsfinanzierungsgesetz (Community Transport Financing Law). This fixed fund out of the general federal budget replaced the earmarking of 0.03 DM per litre on the mineral oil tax which was introduced in 1967, and in fact limited the available funds after 2002 (BMVBW, 2004). The budget for the states is divided between them according to their share of registered vehicles with some adjustments made for the "city states" (Berlin etc.) and new federal states. The funds are granted as a subsidy and share of total costs. The states have to apply for these funds with programmes for community road infrastructure investments (KStB Kommunaler Straßenbau) and for investments into public transport (non-DB infrastructure and vehicles). Besides, the federal level develops in cooperation with the states a complementary federal programme for investments into the railways. Laaser and Rosenschoon (2001) analysed income from and expenditure in the transport sector. General (without external costs) revenues are higher that expenditure, however, even after transfer of funds between federal levels, communities show a large deficit.

Refunding of investments in **inland waterways** is partly through tolls and fees (e.g. for using locks), but mainly from the general federal budget. As in the case of rail infrastructure, part of this is financed through revenues from the mineral oil taxes in the framework of an integrated multi-modal approach. Partly due to historical reasons in international agreements, inland waterway shipping is exempt from mineral oil tax.

The refunding of **airport** investments is mainly through user costs (landing charges etc.) and airport services (rents from retail etc.). Hopf et al. (2003) estimate for the 17 international airports in Germany in the year 2001 the infrastructure related costs of air traffic (airports and facilities, air traffic control, meteorological services) had been in total recovered from user costs. However, infrastructure developments at airports are still subsidised from state budgets and in particular is seen as critical for the recent development of expanding regional airports (see e.g. European Commissions decision on Charleroi airport). Smaller (regional) airports receive on average subsidies of 5.9 Euro for investments and 3.3 Euro for operation per passenger equivalent (Heymann and Vollenkemper, 2005). Since air transport is exempt from mineral oil tax and international flights exempt from VAT, this can be regarded as indirect subsidies from the general public budget. As privatisation is an increasing source of funding for investments in airports. Generally, the chances for success are as greatest for larger airports. However, there is felt to be some danger that larger airports can exercise their market power against the interests of their customers (airlines) and hence some form of price regulation seems necessary (von Hirschhausen, 2004). This would require a transfer of some regulatory power from the federal states to a central regulation agency for efficiency reasons.

Lessons Learnt

The German case study in particular reveals the challenges that lie in the co-ordination of investment decisions between different tiers of political decision making and state institutions plus private actors such as the rail network companies and private investors. Therefore, clear rules are necessary in the selection of projects for investments and there is also a need for a clear division of responsibilities. Co-ordination between different organisations is essential. Following the subsidiarity principle, as many decisions as possible should be taken at the regional level, with the federal level restricting itself to the more strategic goals. In particular in the road sector, this principle has to be re-established, including a revised division of funding sources.

The second major challenge to be observed in this case study is the shift from general public procurement to a user charging oriented system. First steps have been taken with the introduction of the HGV motorway toll and the establishment of the VFIG, but there are still many open questions regarding this organisation, such as its multi-modal character, its political dependence and the issue of whether it should be able to borrow money from the capital market.

Experiences with PPP schemes in Germany are limited. Not the least so, because an already dense transport networks exists such that extensions generate less additional benefit.

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