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(De-)Centralisation of the Operation and Routine Maintenance of Federal Trunk Roads

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List of Abbreviations

approx.	approximately
BAT	Bundes-Angestellentarifvertrag
BCL	Basic Constitutional Law (GG – Grundgesetz)
BMV	Federal Ministry of Transport (BMV – Bundesverkehrsministerium)
Bn	billion
cp.	compare
€	Euro
e.g.	for example (exempli gratia)
et al.	et alii
etc.	et cetera
excl.	exclusive
FHA	Federal Highway Act (FStrG – Bundesfernstraßengesetz)
FM	federal motorway (BAB – Bundesautobahn)
FMMD	federal motorway maintenance division
FMTBH	Federal Ministry of Transport, Building and Housing (BMVBW – Bundesministerium für Verkehr, Bau- und Wohnungswesen)
FR	federal road (BS – Bundesstraße)
FTR	federal trunk road (BFS – Bundesfernstraße)
GPS	global positioning system
H	hour
ibid.	ibidem
i.e.	id est
incl.	inclusive

km	kilometre
Ltd	limited
mn	million
MTLO	Manteltarifvertrag Ost
no.	number
NPM	New Public Management
ÖTV	Gewerkschaft Öffentliche Dienste, Transport und Verkehr
O & M	operation and maintenance
p.	page
R & E	reconstruction and extension
RMD	road maintenance division
TLS	Thuringian State Department of Statistics (Thüringer Landesamt für Statistik)
TLSB	Thuringian State Department for Road Construction (Thüringer Landesamt für Straßenbau)
TMWI	Thuringian Ministry of Economics and Infrastructure (Thüringer Ministerium für Wirtschaft und Infrastruktur)
TSI GmbH	Thüringer Straßenwartungs- und Instandhaltungsgesellschaft mbH
VAT	value added tax
VOB	Verdingungsordnung für Bauleistungen
VOL	Verdingungsordnung für Leistungen
vol.	volume

1 Introduction

In Germany, the Federal Government – according to article 90 paragraph 1 of the Basic Constitutional Law (BCL – “Grundgesetz”) – is owner of the federal trunk roads (FTR) and responsible for planning, construction, operation and maintenance of these roads. The FTR consist of the federal motorways (FM) with a total length of 12,037 km and the federal roads (FR) with a length of 41,246 km in total. The management of construction, operation and maintenance on FTR is delegated to the federal states in line with the principle of the so called “federal order administration”. For that purpose the government provides the federal states with the predominant part of the necessary budget resources. These resources originate from taxes and in parts from revenues of the heavy duty vehicle toll, which will be introduced for the FM in 2005. By the delegation of tasks to the federal states, fairly different approaches for the execution of the operation and maintenance (O & M) of the FTR have been emerged within the federal structure in Germany. This article will examine several institutional solutions for the operation on FTR and particularly on FM. The maintenance of FTR will be marginally incorporated into the analysis, since there are several interdependencies between operation and maintenance. The operation on state and municipal roads will only be taken into account if required for the analysis of the operation on FTR.

For scrutinising the institutional solutions the focus will be put on the following two aspects:

- ***Relationship between Federal Government and federal states within the decentralised model and introduction of an alternative centralised solution:*** It will be investigated how the relationship between the Federal Government and the federal states in the decentralised system of order administration is designed and which opportunities of improvement exist. Additionally it will be discussed, if the decentralised system of order administration should be replaced by a centralised solution, in which the Federal Government manages the operational service on its own responsibility.
- ***Coordinating institution for the management of operation:*** It will be analysed which governance structure the responsible public authorities ought to choose for the management of the operation of the FTR. Up to now the operation is basically realized by the public sector on own responsibility. Alternatively the public sector could use contracting out to transfer the task of realizing the operation to the private sector. This article will discuss alternative solutions for contracting out. Hereby both awarding of contracts for individual services and trades and also for the entire operational service are possible.

Figure 1 provides a diagrammed overview of the different alternatives for the organisation of the operation and maintenance as well as the issues covered by this article.

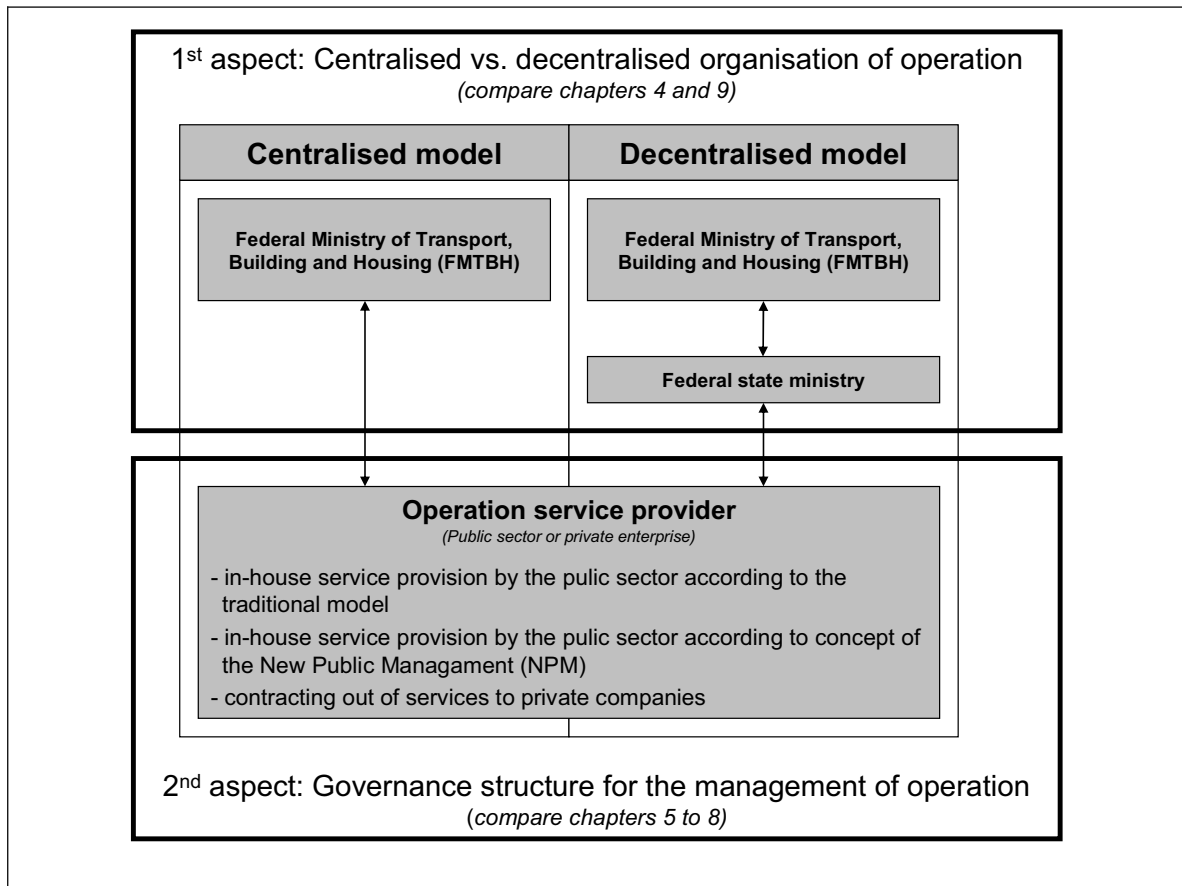


Figure 1: Overview of organisational models and central questions of examination
(Source: own chart)

In this article, first of all chapter 2 will introduce necessary terms and definitions concerning the O & M of roads and will illustrate all trades in depth. Then, chapter 3 lays the theoretical foundation for the analysis of governance structures. The relationship between Federal Government and federal states with regard to the order administration will be discussed in chapter 4. Chapters 5 to 8 will analyse the governance structures for the management of operation with the focus on the balancing decision between in-house service provision and contracting out. The traditional model of the management of the operation on FM will be investigated in chapter 5, while chapter 6 will present and evaluate several reform efforts which basically retain the idea of service provision by the public sector. In the federal state Thuringia all services of operation are contracted out – at least on FR and state roads – which in chapter 7 will be exhaustively described and examined. Chapter 8 will summarise the results of the debate about the governance structures for the operation of roads. Concluding chapter 9 will scrutinise whether a centralised model outclasses the present decentralised model with regard to the management of operation and whether the principle of order administration should be abolished.

2 Overview to operation and maintenance of federal trunk roads

In this chapter, section 2.1 gives an overview about the cognizances and the financial dimensions regarding the maintenance of the network of FTR in Germany. Subsequently the different services of the O & M on FTR will be described and classified (section 2.2) prior to a discussion of the importance of the several trades (section 2.3). Concluding with section 2.4, information about the cost structures for the operation of roads will be provided.

2.1 Federal trunk roads – an overview

In the Federal Republic of Germany, the political subdivisions federal government, federal states and the independent communities administer each different category of roads. They are the legally and financially responsible bodies for the management of the respective roads. The FTR fall into the area of responsibility of the federal government. The entire network consists of the FM with a total length of 12,037 km and the FR with a length of 41,246 km in total. The obligation of operating and maintaining these roads as parts of the sustainment of motorways prescribes § 3 of the Federal Highway Act (FHA). The federal government as owner of the FTR delegates the administration and thus its maintenance to the federal states in line with the principle of the so called “federal order administration” (“Auftragsverwaltung”) according to article 90 paragraph 2 of the BCL. For that purpose the government provides the federal states with the predominant part of the necessary financial resources. In 2002 the federal states received funds of € 2.341 bn for the discharge of their duties of operating and maintaining the FTR of which the FM account for € 1.336 bn and the FR for € 1.005 bn. The federal states are additionally responsible for the countrywide 86,868 km state roads, whereas the 91,430 km municipal roads are assigned to the independent, local municipalities. The classification and the respective network lengths of roads are summarised and illustrated in table 1.

type of road networks	Network length of roads
federal trunk roads	53.283 km
thereof: federal motorways	12.037 km
federal roads	41.246 km
state roads	86.868 km
municipal roads	91.430 km

Table 1: Length of the road networks outside built-up areas on 01.01.2003

(Source: BMVBW (2004, p. 7))

2.2 Services of operation and maintenance

2.2.1 Current classification of duties according to the provisions of the Federal Ministry of Transport, Building and Housing

Within the system of order administration, the Federal Ministry of Transport, Building and Housing (FMTBH) has the overall competency for O & M of the FM and performs coordinating functions.¹ To distinguish between operational and maintenance services and to classify the trades within these fields as well as to assign the several tasks to those trades, the FMTBH uses the findings of DURTH ET AL (2001), the so called "System Specification of the Operational Maintenance of Federal Motorways" ("Leistungsheft für die betriebliche Straßenunterhaltung auf Bundesfernstraßen").²

OPERATION IN THE NARROWER SENSE

According to DURTH ET AL. (2001) the operation contains all tasks that are necessary for a safe use of roads.³ The operation does not have an influence either on the operability in general or on the substance of the structure road. Within the scope of the operational service, several tasks can be assigned to the subsequent trades according to DURTH ET AL. (2001) which will be collectively referred to as "operation in the narrower sense" in the following:

- **Green space upkeep:** This field comprises services like the mowing of grass strips, the maintenance of groves and trees along the way as well as the elimination of traffic hazards due to overthrown and uprooted trees.⁴
- **Service and maintenance of street furniture:** Street furniture contains among other elements traffic signs, reflection posts, crash barriers and lavatories of lay-bys.⁵ These and other facilities have to be maintained according to requirements.
- **Cleaning:** Cleaning in this sense covers the cleaning of the road surface, the removal of hazardous dirt and fouling, the waste disposal, the cleaning of lavatories, traffic signs, reflection posts, ditches, pits, wells, tunnel and bridge constructions, noise barriers as well as the cleaning of drainage facilities to assure their functional efficiency etc.⁶
- **Winter road clearance:** The winter road clearance aims at securing the operating efficiency of the existing road network and to ensure the road safety, i.e. obstructions of traffic due to wintry influences should be prevented, reduced and eliminated, if possible.⁷ When required

¹ Detailed description of order administration follows in section 4.1.

² Cp. Durth et al. (2001).

³ Ibid. p. 0.5.

⁴ Ibid. pp. 2.2.

⁵ Ibid. pp. 3.2.

⁶ Ibid. pp. 4.3.

⁷ Ibid. pp. 5.2.

winter road maintenance also has tasks like snow clearing, winter gritting and scattering salt on road traffic areas, removing side slopes, oddments of snow and snow banks as well as erecting and dismantling of snow fences and snow warning signs.

- **Further tasks:** Further tasks within the scope of the operational road maintenance are different services like safeguarding of road works, workplaces and places of accident and their removal as well as the collaboration in nationwide traffic census.⁸
- **Immediate measures for maintenance on roadway (upcoming):** By 01/01/2005 FMTBH plans the introduction of a new task list for the operational maintenance service on FTR in which the current classification of services will be partly modified.⁹ Thus, for instance a new service type will be created which is called “immediate measures for maintenance on roadway” whereas the term roadway in this connection refers to all kind of measures within the scope of roads in general.¹⁰ These measures will contain locally limited reinstatement works on small scale and protections to prevent direct impairment of road safety as well as workings to restore the operating efficiency of the road.

FURTHER SERVICES OF OPERATIONAL AND MAINTENANCE SERVICE IN THE NARROWER SENSE

According to DURTH ET AL. (2001) maintenance measures comprise all services for preserving and restoring the condition and structural substance of roads and its constituent parts that meet the respective requirements.¹¹ For the differentiation of O & M the FMTBH, in line with DURTH ET AL. (2001), assigns services like the so called „constructional maintenance“, the service and maintenance in the scope of “operational maintenance” as well as the maintenance and reinstatement service in form of selected and small scale workings of preservation to the service type of operational service, which will be referred to as “operation in the broader sense” below:¹²

- **Operational maintenance (preventive or ongoing maintenance):** According to DURTH ET AL. (2001) services of operational maintenance serve the purpose of maintaining the condition and constructional substance of the structure road that meet the given requirements.¹³ Thus, operational maintenance includes the monitoring and inspection as well as service and maintenance of roads. Monitoring activities and inspections, as for instance checks of roadway and bridges, support the assessment of condition and structural substance of the road. Maintenance activities are performed to preserve the condition and structural substance of the road. The omission would lead to a reduction of the operability or the net asset value.

⁸ Cp. Durth et al. (2001, pp. 6.2) and Schüßler Plan (2004).

⁹ According to a statement of Mr Stefan Zirngibl during a meeting on 15/06/2004.

¹⁰ Cp. Durth et al. (2004, pp. 1.1).

¹¹ Cp. Durth et al. (2001, p. 0.5).

¹² Ibid. pp. 0.4.

¹³ Ibid. pp. 0.5.

Examples for service and maintenance activities are the cleaning of drainage facilities and road signs as well as the maintenance of electro technical facilities.

- **Constructional service and maintenance:** Operations of constructional service within the scope of operational road maintenance are limited to small scale maintenance activities in form of immediate measures of construction, which in consequence do not remarkably enhance the utility value of a metalled road or structure, but sustain or improve the net asset value.¹⁴

“Maintenance in the narrower sense” only consists of reinstatement and renovation.¹⁵ The differentiation between the several areas of “maintenance in the broader sense”, which incorporates the constructional maintenance, the preventive maintenance, the reinstatement and the renovation activities, depends on the respective range of performance. In contrary to small scale activities of constructional and preventive maintenance, reinstatement workings are in general activities on a larger scale. But they only involve workings on the upper layers of the road, whereas the renovation activities often redo – beside the upper layer of ballast – even the base and sub-base layers.

OVERVIEW OF THE SEGMENTATION OF SERVICES ACCORDING TO DEFAULTS OF FMTBH

Table 2 provides a survey of services of road maintenance and their classification to operation and maintenance according to defaults of FMTBH in DURTH ET AL. (2001).

¹⁴ Cp. Durth et al. (2001, pp 1.2).

¹⁵ Ibid. p. 0.5.

Operation (in narrower sense)	Operation (in broader sense)	Green space upkeep		
		Service and maintenance of street furniture		
		Cleaning		
		Winter road clearance		
		Further tasks		
		<i>Immediate measures for maintenance on roadway (upcoming)</i>		
Maintenance (in broader sense)	Constructional maintenance and preventive maintenance as range of service of the operational service (reinstatement, overhaul, reinstatement and renovation of small components or small furnishing)			
	Operational maintenance (preventive or ongoing maintenance)	Maintenance (preservation)		
		Monitoring (inspection)		
	Maintenance (in narrower sense)	Reinstatement	on upper layers (e.g. road surface treatment, thin layer pavement)	
			on upper layers (e.g. structural and underground engineering of upper layer)	
Renovation		on upper layer (e.g. structural and underground engineering of upper layer)		
	on base layer(s) and roadbed, (e.g. fortification, underground engineering incl. sub-base layers)			
Construction (new building, extension, replacement, reconstruction and modification of roads)				

Services of the operational road maintenance according to defaults of the FMTBH in the task list of operational road maintenance on FM

Table 2: Segmentation of services of operation and maintenance of roads taking into consideration defaults of the FMTBH
 (Source: own chart following Durth et al. (2001, p. 0.6) and Schüßler-Plan (2004))

2.2.2 Discussion and adjustment of the classification of services

The present classification of services by the FMTBH according to DURTH ET AL. (2001), in which the constructional and preventive maintenance activities are assigned to the operational service, can cause trouble with the implementation of new organisational models for the operation and maintenance of FM in the middle or long run. If for instance the aim is to contract out entire parts of the value chain or to contract out jointly several levels of the value chain in long term contracts, the unclear definition of responsibilities could prevent or at least complicate an economically reasonable

bundling of tasks.¹⁶ Thus, in this paper the blending of task definitions for O & M will be put aside and instead constructional and preventive maintenance will be entirely assigned to maintenance. Considerations in this regard also exist with the FMTBH, which aim at a clear separation of tasks for O & M in the course of the introduction of the new task catalogue for the operational service of roads by January 2005.¹⁷ Out of this reason the new service type “immediate measures for maintenance on roadway” should also be divided up into immediate measures of operational service and immediate measures of maintenance.

Moreover the monitoring of road condition and of the provision of services for O & M will be presented as a service type of its own, which would become more important if O & M were contracted out in long term contracts. Table 3 gives an overview of the modification in contrast of the current classification of services by the FMTBH as well as of the alternate segmentation of services which will be used in this paper unless countermanded.

Monitoring	Monitoring of road condition and of the provision of services for O & M
Operation	Green space upkeep
	Service and maintenance within the operational service of roads (road furniture and side facilities)
	Cleaning
	Winter road clearance
	Further tasks
	Immediate measures within the operational service (excl. roadway work)
Maintenance	Inspection (roadway)
	Service and maintenance on roadway (incl. immediate measures)
	Reinstatement
	Renovation
New building, extension, replacement, reconstruction and modification of roads	

Table 3: Segmentation of services of operation and maintenance of roads – following own approach (Source: own chart)

¹⁶ An example for such an organisational model is the so called functional building contract (“Funktionsbauvertrag”), in which by coordinating construction and maintenance as two components of the value chain the life cycle costs of the structure road are to be optimised; cp. DREHER (2003, p. 260). The agent of the construction work in a functional building contract is responsible not only for the construction but also for the following maintenance of the structure within a 20-year maintenance period. Cp. for detailed information about the functional building contract KNOLL ET AL (1999).

¹⁷ According to a statement of Mr Stefan Zirngibl during a meeting on 15/06/2004.

2.3 Importance of individual trades

Regarding the importance of individual trades in respect of the total expenditure for the operational service on FTR, there is not reliable information available. Due to a lack of activity and data recording, FMTBH does not have access to information about the shares of individual trades.¹⁸ Also in the literature, only isolated rough estimates exist with regard to the importance of each single trade, which are based to some extent on a classification deviating from the one of the FMTBH. In table 4 estimations by KUTTER (2004) relating to the share of particular trades of the operational service on FM are displayed. But as a result of unequal or even missing activity recording the data ought to be evaluated carefully.¹⁹

Federal motorways	1993	2002	Average over 10 years
Constructional maintenance	13.8 %	14.7 %	14.9 %
Green space upkeep	16.5 %	16.6 %	17.5 %
Cleaning	17.5 %	19.9 %	18.6 %
Winter road clearance	13.4 %	11.6 %	13.5 %
Traffic engineering services	14.3 %	12.3 %	13.4 %
Damage removal	15.0 %	15.4 %	12.6 %
Non-route related services	9.5 %	9.5 %	9.5 %
Sum	100.0 %	100.0 %	100.0 %

**Table 4: Importance of individual trades on federal motorways in national average
(Source: Kutter (2004, p. 938))**

One indicator for the scope of particular tasks on FR provides DURTH (1998), whose values presented in figure 2, also need a careful examination because of missing data.²⁰ Assured values come from the federal state Thuringia, where the operation of FR is completely assigned to private companies and information about the importance of individual trades can be obtained by the use of biddings from contracting-out procedures and bills of the private companies. The value-based share of the individual trades on FR in Thuringia is shown in figure 3. Although the classification of trades in Thuringia shows certain variations, the partly remarkable differences in values to those of DURTH (1998) cannot only be explained by these discrepancies or topographic and other circumstances in Thuringia, but are also caused by the lack of countrywide activity and data recording, Insofar clear statements about the countrywide importance of certain trades on FTR cannot be made.

¹⁸ According to a statement of Mr Stefan Zirngibl during a meeting on 15/06/2004.

¹⁹ Cp. Kutter (2004, p. 938).

²⁰ Cp. Durth (1998, p. 8).

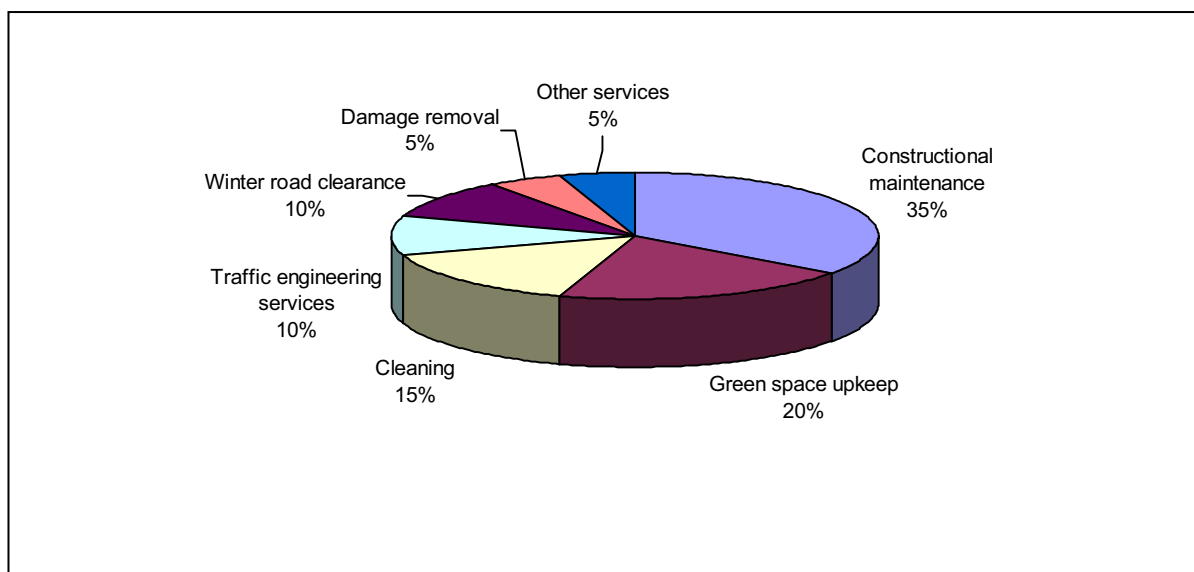


Figure 2: Estimations for the hourly expenditure shares of the total volume of services in a road maintenance division in 1994
(Source: own diagram following Durth (1998, p. 8))

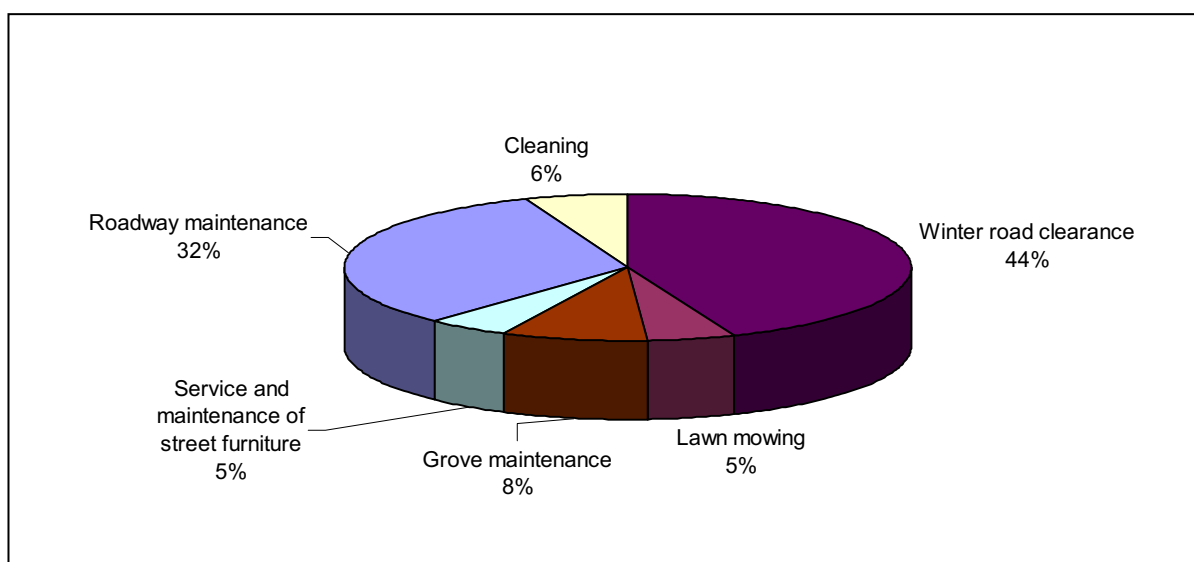


Figure 3: Importance of trades on federal roads in Thuringia (Source: own diagram)

2.4 Cost structures and least optimal enterprise size

Important for reducing the costs of operation on FTR and on subordinated categories of roads might be, beside the choice of the size of enterprise for federal motorway and road maintenance divisions, the utilisation of synergies either between individual trades or between different categories of roads.

LEAST OPTIMAL SIZE OF ENTERPRISE

With respect to the least optimal enterprise size of federal motorway maintenance divisions (FMMD) for the provision of operational services on FM as well as the size of road maintenance divisions (RMD), which are responsible for the operation of FR, state roads and in parts municipal roads,

detailed studies for Germany do not exist so far – according to the authors' level of awareness. At present in Germany, 181 FMMD look after 12,037 km of FM, which is equal to an average length of road of approx. 66.5 km.²¹ The assessment basis for an average representative FMMD accounts for 70 km of continuous roadway.²²

The remaining road network is operated by 586 RMD at present. According to KUTTER (2004), by reallocating of divisions combined with an extension of the average length per division up to more than 350 km, economies of scale can be realised.²³ Especially potentials of rationalisation within the administration and an improved utilisation of capacities seem to be possible, but the importance of these points stays unclear. Thus, need for further research can be identified.

SYNERGIES BETWEEN TRADES (ECONOMIES OF SCOPE)

Furthermore cost savings should be possible by realising synergies between different trades. Particularly with manageable and predictable operations an amalgamation and coordination of several workings seem to be in favour to cut cartage costs for instance.²⁴ Additionally by a combined processing of workings, traffic interferences and hence economic costs of congestion can be reduced. So far there are no studies investigating the scope of possible cost saving potentials by the realisation of economies of scope, however a research project dealing with that topic is going to be assigned by the FMTBH within the next years.²⁵

SYNERGIES BETWEEN DIFFERENT ROAD CATEGORIES

A further starting point for cost savings is the model of the so called mixed road maintenance divisions or just "mixed divisions", which maintain not only FM but also FR and state roads. Particularly higher utilisation ratios of the existing resources, a raise of flexibility and last but not least a pooling of administration constitute the benefits from merging FMMD and RMD.²⁶ However, an increased heterogeneity of services accounts for the negative side which might lead to more complex contract structures and intensified principal-agent-problems especially by an augmentation of the outsourcing ratio to private companies. The evaluation of the several effects occurring while implementing mixed divisions has hardly been regarded in the economic literature so far and demands for further research in that field.

²¹ Cp. Kutter (2004, p. 933).

²² Ibid. p. 941.

²³ Ibid. pp. 949.

²⁴ According to a statement of Mr Stefan Zirngibl and Mr Gregor Schröder during a meeting on 26/07/2004.

²⁵ According to a statement of Mr Stefan Zirngibl and Mr Gregor Schröder during a meeting on 26/07/2004.

²⁶ Cp. Kutter (2004, p. 950).

3 Theoretical basics for the analysis of institutional options for the management of the operational service

This chapter initiates the theoretical fundamentals, which will be referred to in the following sections that deal with institutional alternatives for the management of the operational service. For this purpose section 3.1 will introduce criteria for the evaluation of institutional options, which will be applied to the governing structures examined in this article: the in-house service provision run by public enterprises in section 3.2 as well as the external service provision in the context of the so called contracting out in section 3.3.

3.1 Objectives and criteria for evaluation

In the course of the comparison and the evaluation of several institutional alternatives for the fulfilment of sovereign duties in general and for the management of the operational service of roads in particular this article will revert to the criteria introduced below:

- **Cost-efficiency:** Cost-efficiency considers the ratio of output to input. If a service or activity is provided at the least possible economic costs, cost-efficiency is accomplished. Hereby not only the cost of production as well as the cost of risk bearing as part of the cost of capital will be taken into account but also the cost arising for the utilisation of institutions which will also be referred to as transaction costs.
- **Qualitative efficiency and effectiveness:** According to BRENCK (2001) the qualitative efficiency describes "... the choice of product quality.²⁷ As one can easily comprehend, the product quality is efficient if the marginal cost of an incremental quality increasing step equals exactly the additional aggregated readiness to pay for the quality improvement." In practice – especially in non-competitive markets – it is partly quite difficult to decide which level of quality is efficient. Therefore this article will basically only discuss whether a default level of quality is reached or not, which means that in the positive case the service provision is effective.²⁸
- **Flow of information about costs:** In addition this article examines in the course of the analysis of institutional alternatives for the operational service the criterion "flow of information about costs". The decision of the federal states for one of the governing structures purposed to manage the operational service has implications on the remaining possibilities of the Federal Government to monitor the costs arising during the operation of roads. In this context the criterion "flow of information about costs" should allow to evaluate to what extent the respective federal state has information about costs and to what extent again the Federal Government has access to cost data and can interpret these data.

²⁷ Cp. Brenck (2001, p. 1).

²⁸ Thereby the default level of quality does not have to be efficient.

3.2 In-house service provision run by public enterprises

SHORTCOMINGS OF IN-HOUSE SERVICE PROVISION BY PUBLIC AUTHORITIES AFTER THE TRADITIONAL MODEL

In the traditional model of the service provision by the public sector, bureaucrats have an information advantage towards politicians according to the theory of bureaucracy, which they can exploit on their own behalf.²⁹ Assuming that a bureaucrat intends to maximise his individual benefit, within his discretionary sphere of influence he aims at maximising his budget. To what extent the effectiveness and efficiency of service provision will be aggravated depends on the degree and structure of the bureaucrat's preferences for special resources. If the bureaucrat uses his additional budget for an increase of the productive capacity to strengthen his power, for instance employing more subordinates, the output will be too extensive, which means that the objective of effectiveness is missed, although the oversized supply could still be provided efficiently. If in contrast the extra budget funds are spent for operationally non-essential amenities, the service provision can be effective, but not efficient. In practise often both cases may occur at the same time, so that the service provision by public enterprises following the traditional way is neither effective nor efficient. Such behaviour of the bureaucrats is facilitated by the lack of incentive, control and sanctioning mechanisms.³⁰ Furthermore the flow of information about costs can be rated very low due to inappropriate instruments of supervision.³¹

CONCEPT OF THE NEW PUBLIC MANAGEMENT

The instruments of the so called New Public Management can be seen as one approach to solve the problems associated with the traditional service provision by the public sector. According to REICHARD (1995), the New Public Management is one perspective of administration that is more strongly oriented towards the rationality of a market economy and that supersedes – at least in parts – the bureaucratic understanding of administrative system.³² The theoretical background is provided by the Public-Choice-Theory as well as by several approaches of the Management Theory. The efforts of reform of the New Public Management comprise the creation of incentive systems for employees by introducing performance-linked types of remuneration, the merging of technical and resource responsibility, the reporting of cost and activity accounting, the management by objectives in the context of contract management as well as the implementation of market and competitive elements by increasing the importance of contracting out.³³ The objectives of the New Public Management, which can be achieved theoretically by an ideal-typical implementation of its components, consist in increasing the transparency, improving the comparability of the costs for internal and external service provision as well as enhancing the efficiency and effectiveness. Table 5 provides an overview of the

²⁹ For an illustration on the theory of bureaucracy cp. Blankart (2001, pp. 492) and Niskanen (1971).

³⁰ Cp. Bernhardt (2000, p. 45).

³¹ Cp. Blankart (2001, p. 492).

³² Cp. Reichard (1995, p. 65).

³³ Cp. Budäus / Grüning (1998, p. 7).

drawbacks of the traditional model and the according efforts of reform following ideas of the New Public Management.

Shortfalls of the traditional model	Reason for the deficits / problems in the traditional model	Counter actions in the line of the New Public Management
High personnel costs	Shirking	Creation of incentive systems for employees (performance-linked remuneration, fixed-term contracts, no political ban on staff layoffs)
		Merging of technical and resource responsibility
Discretionary sphere of influence for bureaucrats	Lack of transparency about costs of service provision for politicians and citizens	Cost and activity accounting
		Transparency by information disclosure
		Introduction of market and competitive elements (e.g. benchmarking and contracting out of services)
Low productive and cost efficiency	Budget maximising bureaucrats	Contract management (management by objectives, budgeting and output controlling)

Table 5: Actions of the New Public Management to solve the critical issues of the traditional model (Source: own chart following Bernhardt (2000, p. 11))

3.3 Contracting out

A possible alternative for the service provision by the public sector is the so called contracting out of services, whereby long-term contracts for the provision of services are awarded to private companies by tender action for a limited period of time.³⁴ In the following the term contracting out will refer to contracts, which assigns the task execution and service provision respectively to the private sector for a long-term period.³⁵ An advantage of the contracting out compared to the in-house service provision by the public sector that can be observed quite often in practice is the increased flow of information about costs. By awarding a contract to private bidders information about the cost of a service can be obtained, which cannot or only insufficiently be monitored if the service is provided by public enterprises due to the missing signalling function of the price mechanism.^{36, 37} To what extent the costs can be actually projected ex-ante depends decisively on the prior selection of the type of remuneration. In case of fixed price agreements – insofar renegotiations are not expected – the costs can be predicted ex-ante relatively easily, but which is not necessarily guaranteed in case of unit price

³⁴ The fostering of the contracting out can be seen as part of the New Public Management (NPM). A complete contracting out and the abandonment of the possibility for a service provision by the public sector goes beyond the basic ideas of the New Public Management and will not be discussed as a form of the NPM in this article.

³⁵ The more general term awarding of contracts comprise not only contracting out but also the invitation for tender of individual tasks that have to be rendered in a shorter period of time.

³⁶ Cp. McAfee / McMillan (1988, p. 143).

contracts and a cost-plus type of remuneration. Moreover it is not possible to evaluate the effectiveness of the contracting out without taking into account the type of remuneration.

In contrary to the prevalent opinion, studies, e.g. conducted in the UK, show that the service provision by private companies does not necessarily result in efficiency gains.³⁸ On the basis of the following aspects it can be checked from the outset if by contracting out efficiency increases can be expected:³⁹

- **Well-structured catalogue of services and good descriptiveness of quality:** If the activities can be described elaborately and if the quality can be measured and recorded thoroughly, then a contracting out tends to be successful
- **Investments of low specificity required by the tenderer:** If the successful tenderer has to make high specific investments, a long contract duration that allows for amortising the investments is reasonable. But in that case the uncertainty about environmental circumstances is getting higher and it becomes more difficult to codify the terms of services to be rendered in a contract. Therefore contracting out tends to be more successful if the contractor does not have to make any or just minor specific investments.

Unless specific investments in human resources have to be executed, but only those in equipment and machinery, also the public sector can perform such investments in advance and leave them to the successful tenderer for the contract period. But this method is only reasonable, if through the pre-selection of investment goods by the public sector the possibility of the bidders to seek for more efficient procedures is not all-to limited. Furthermore it has to be guaranteed that after the expiration of the contract and the obligatory return of the investment goods their level of asset depreciation and quality condition can still be assessed.

- **High intensity of competition:** If during the tendering process the intensity of competition is fairly high, then the submitted bids of the private companies tends to be relatively low and accordingly the expenditures of the public sector are also lower. In young and emerging markets there is the danger that a competitor with a fairly broad market share has a know-how advantage. Other companies would be forced to firstly invest into the generation of idiosyncratic knowledge which could even prevent them from entering the market.

If services are well-structured and thus can be set-up more easily into contracts, then the fixed price agreement or the unit price contract is suited for the sought-after type of remuneration which creates

³⁷ To what extent information about the costs of in-house service provision by the public sector in the line with the New Public Management can be gathered depends on the degree of the implementation of essential elements of the NPM.

³⁸ Cp. Martin / Parker (1997, pp. 204).

³⁹ Cp. Domberger / Jensen (1997).

high incentives for an efficient provision of service.⁴⁰ But if in contrast a cost-plus agreement is applied or if due to frequent renegotiations the remuneration is quasi oriented to the arising costs then it is arguable whether the cost-efficiency will increase after the contracting out of services.

4 Discussion about the relationship between federal government and federal states regarding the order administration

This chapter focuses on the relationship between the Federal Government and the federal states within the presently applied framework of a decentralised solution in Germany. At first section 4.1 will describe the legal instrument of the federal order administration, which is used by the Federal Government to assign the federal states with tasks of the O & M on FTR. Subsequently section 4.2 will illustrate the allocation of budget resources, which the federal states receive from the Government for the O & M of FTR. Finally section 4.3 will summarisingly evaluate the relationship between Federal Government and federal states.

4.1 Responsibility of federal states for operating federal trunk roads

Although the Federal Government as the legally and financially responsible body for road management delegates the activities of construction, operation and maintenance of FTR to the federal states by aid of the federal order administration principle (article 90 BCL), the FMTBH is responsible for the centralised and coordinating management of the FTR. Again on the level of the federal states the respective state ministry is the top level responsible body for road management.⁴¹

In the line with order administration the federal states which are in charge of the management of roads act on their own responsibility and execute the tasks which were assigned to them with an independent administration, i.e. with a separate structure of authorities.⁴² The federal states basically perform all tasks in an external relationship fashion, i.e. they have the so called competence to administer, which comprises for instance to conclude contracts. But the order administration differs from the enforcement of federal laws by the federal states as their own affair according to article 83 BCL, since the so called internal competence stays with the Federal Government.⁴³ The internal competence of the Federal Government on the one hand assigns the financial responsibility to itself, but at the same time allows the FMTBH as the superordinate responsible federal ministry to exercise

⁴⁰ Applying unit price contracts several problems can arise, especially unbalanced bidding. For a detailed discussion on unbalanced bidding cp. Burnett / Wampler (1998), Diekmann et al. (1982) and Ewerhart / Fieseler (2003).

⁴¹ According to article 22 paragraph 1 and 4 FHA.

⁴² Cp. Schüler (2004, pp. 4-5).

⁴³ Cp. Zech (1987, p. 1090).

hierarchical direction and control functions towards the federal states.⁴⁴ Thus, the federal order administration can be seen as an attempt of combining a central governing power and a uniform procedure for the management of FTR with a decentralised structure of authorities. From an economic point of view the federal order administration results in a two-stage principal-agent-relationship.⁴⁵

- In the relationship Federal Government – federal state, the national government acts as the principal and the individual state as the agent.
- The second principal-agent-relationship occurs between the federal state or the responsible state authority respectively as the principal and the institution which was assigned with the task execution as the agent. The position of the agent can be assumed by either the subordinate authority or the private company who has won the award of contract.

4.2 Allocation of resources to the federal states by the Federal Government and regulations for the provision of service

With regard to the order administration of FTR, the Federal Government as the legally and financially responsible body for road management activities bears all the arising costs with the exception of administrative expenses of the federal states.⁴⁶ The federal states have to pay the costs of their administration on their own.⁴⁷ The Federal Government provides the federal states with quality specifications as part of the system specifications for road O & M, but the federal states do not apply the specifications what is justified with the lack of practicability by them.⁴⁸ Moreover the Federal Government does not monitor the quality of the O & M on FTR in the individual federal states and allocates the resources regardless of the management quality of O & M.

The budget resources to the federal states are allocated by the Federal Government via specific budget items. Traditionally two kinds of items can be distinguished – the so called O & M item (“UI-Titel” – resources for operation and maintenance) and the R & E item (“UA-Titel” – resources for reconstruction and extension). Albeit the term O & M as well as the R & E item do not occur any longer in the budget, the terms for the items are still in use. In a circular from November 22nd, 1994, the FMTBH gives provisions, which service costs have to be settled via which item.⁴⁹

⁴⁴ Cp. for detailed information regarding the federal order administration article 85 BCL.

⁴⁵ Cp. Bernhardt (2000, p. 74).

⁴⁶ According to article 104a paragraph 2 BCL. Extract from the Basic Constitutional Law, article 104a, paragraph 2 BCL: “If federal states act on behalf of the Federal Government, the Federal Government has to bear the arising costs.”

⁴⁷ According to article 104a paragraph 5 BCL. Extract from the Basic Constitutional Law, article 104a, paragraph 5 BCL: “The Federal Government and the federal states respectively pay the expenses which originate from their own authorities (...).”

⁴⁸ According to information by Mr Stefan Zirngibl in a conversation on 15/06/2004 as well as according to statements by Mr Uwe Drescher in a conversation on 26/05/2004.

⁴⁹ Cp. Kutter (2004, p. 935).

- **O & M items:** The O & M items comprise resources for operational service activities as per current definition of the FMTBH, i.e. operational service in the broad sense, which consists of the operational service in the narrower sense, the constructional and operational maintenance as well as the preventive maintenance. Excluded from the accounting via O & M items are the service activities of constructional maintenance which are performed by private companies instead of public authorities.
- **R & E items:** R & E items are used beside service activities of maintenance in the narrower sense for the reconstruction and extension of roads.

In practise there is scope for interpretation of classifications, so that activities can be partly paid from both O & M funds and R & E resources,⁵⁰ whereas shifting of activities between O & M items and R & E items is only possible within certain limits.⁵¹ The FMTBH intends to assign the constructional and operational as well as the preventive maintenance to the overall domain of maintenance, so that all the maintenance activities would fall clearly into the scope of R & E resources, which would reduce the scope of interpretation remarkably.⁵²

The level of O & M and R & E funds will be firstly estimated by the Federal Government in the course of arranging the budget based on the expenditure of previous fiscal periods and will be submitted to the budget plan.⁵³ The submitted funds constitute the basis for the subsequent applications of demand of the federal states. The allocation of the eventually passed O & M resources complies with a allocation key, which takes into account the length of FTR as well as the number of lanes regardless the side-strips.⁵⁴ In this way, for the year 2002 an O & M ratio of 28,590 €/km arose for FM and a ratio of 9,320 €/km for the FR.⁵⁵ The R & E funds are distributed specifically for the individual federal states according to the planned construction projects.⁵⁶ The following table 6 gives an overview of the absolute levels of the respective budget resources, divided according to purpose and type of road network.

⁵⁰ According to information by Mr Hans-Reinhard Reuter in a conversation on 04/05/2004. For instance according to Roland Berger & Partner (1996, p. 4 and pp. 13-14) in Thuringia in the year 1995 budget items which included among others R & E items of the Federal Government were accessed to a great extent for the service provision of O & M activities, so that they accounted for approx. 30 % of the total costs of O & M services in the end.

⁵¹ According to information by Mr Uwe Drescher in a conversation on 26/05/2004.

⁵² According to information by Mr Stefan Zirngibl in a conversation on 15/06/2004.

⁵³ Cp. Bernhardt (2000, p. 95).

⁵⁴ According to information by Mr Gunnar Loichen and Mr Thomas Schütt in a conversation on 17/05/2004.

⁵⁵ Cp. Kutter (2004, p. 933).

⁵⁶ Cp. Humborg (2003, pp. 94-95).

Type of road network	Expenditure for maintenance as per definition of the FMTBH		Expenditure for operation as per definition of the FMTBH	
	Total	Average (R & E ratio)	Total	Average (O & M ratio)
Federal trunk roads	€1,580 mn		€ 760.5 mn	
thereof: Federal motorways	€ 956 mn	~ 70,000 €/km	€ 379.8 mn	28,590 €/km
Federal roads	€ 624 mn	~ 14,300 €/km	€ 380.7 mn	9,320 €/km

Table 6: Expenditure for operation and maintenance of federal trunk roads in 2002

(Source: own chart following FMTBH (2004, p. 55) and Kutter (2004, p. 933))

4.3 Discussion about the relationship between Federal Government and federal states

EVALUATION OF EFFECTIVENESS, COST EFFICIENCY AND FLOW OF INFORMATION ABOUT COSTS

Within the relationship between Federal Government and federal states the experience shows that the appropriated resources for O & M are exploited almost exhaustively.⁵⁷ Thus, the quality of road O & M is adjusted to the available funds. In this respect the effectiveness of service provision has to be rated relatively low from the perspective of the Federal Government, whereas an exact evaluation of the effectiveness is hampered due to the lack of precise objectives describing the requested level of quality.⁵⁸

Theoretically the federal states could have high incentives for a cost-efficient provision of service under the current system of resource allocation. With a fixed level of available federal budget funds and a missing monitoring of effectiveness by the Federal Government, the respective state government could attain a high quality of the road network and thus enhance the chances for its re-election. Otherwise decisions of the state government which lead to cost savings and efficiency gains in the operation of FTR, as for instance staff cuts, might result in a loss of votes which again reduces the probability to win the next election. Thus, one cannot expect that with the present organisational design of the relationship between Federal Government and federal state, all states will act in the interest of the national government and will aim at saving costs.

The current flow of information about costs within the relationship Federal Government-federal state is to be evaluated negatively. Due to the lack of control by the Federal Government and the direct responsibility of the federal states, which results from the order administration, the states can exploit

⁵⁷ According to information by Mr Stefan Zirngibl in a conversation on 15/06/2004, by Mr Hans-Reinhard Reuter in a conversation on 04/05/2004 as well as by Mr Uwe Drescher in a conversation on 26/05/2004.

⁵⁸ If the present quality of road condition and possibly future defaults of the Federal Government will fit the willingness to pay of the user and thus will be effective from a user point of view, has to be separated from this question and will not be issue of this survey.

their information advantage, so that the national government does not receive sufficient information about costs and the scope of service provision.⁵⁹

FALSE INCENTIVES DUE TO THE DESIGN OF RESOURCE ALLOCATION TO FEDERAL STATES

Another critical point concerning the design of resource allocation between Federal Government and federal state is the influence of the current system of resource allocation on the decision about the appropriate institutional solution for the management of operation on the federal state level. The obligation of the federal states to assume the costs of administration can create false incentives for the federal states to choose the solution related with the lowest administrative costs which is not necessarily the economically most cost-efficient solution. Also coupling the accounting of constructional maintenance activities with the mode of service provision – in-house performance or contracting out – in the context of setting the appropriate ratio for contracted out to in-house services tends to result in false incentives and thus should be suspended.

DISCUSSION ON THE IMPLEMENTATION OF AN INCENTIVE-ORIENTED RESSOURCE ALLOACTION SYSTEM

For the future the FMTBH intends to increasingly demand from the federal states a more efficient service provision based on an advanced specification catalogue.⁶⁰ Furthermore it is planned to provide the state authorities with more precise defaults for the transmission of information on cost developments and to impose respective obligations, which shall lay the foundation for the request of a more efficient resource employment by the federal states. Certainly, this approach has to be looked upon favourably, but the implications on the choice of the institutional option for the management of the operational service in the federal states are to be surveyed more closely.

As illustrated in section 3.3, more precise information on costs will be available for the federal states and will also be comprehended more easily by the Federal Government as the superordinate principal, if O & M road services are contracted out. Thus, with regard to a system of contracted out O & M road services, the information deficits of the Federal Government could be relatively low. If in the course of a competitive tender procedure an efficient company is selected for the management of the operational service, the Federal Government could appropriate funds to the federal state which exactly matches the level that is required for an efficient provision of that service. But the federal state would gain an advantage if the Federal Government allocated more funds than the level of actual costs or if in the course of an inefficient service provision unreasonably high costs arose, so that the federal state could employ more staff than needed. Hence, ensuring the information head start and the linked information surplus would be rather possible for the federal states if they manage the O & M service on their own responsibility.⁶¹ In this respect, a resource allocation of the Federal Government to the federal states, which considers more carefully the cost statements of the states and which is combined with a monitoring of the effectiveness, could create incentives for the federal states not to contract out

⁵⁹ Cp. Bernhardt (2000, p. 74).

⁶⁰ According to Mr Stefan Zirngibl in a conversation on 15/06/2004.

⁶¹ For an illustration on the information surplus cp. Laffont / Tirole (1993).

the operation of roads. An enhanced system for the allocation of funds should eliminate such false incentives. Regarding the allocation of federal budget funds a distinction should be made. The federal states, in which cost savings were achieved, should be allowed to retain parts of the economies whereas in the federal states, in which there have not been any progresses in productivity, not all the costs should be compensated. Such a system of resource allocation would inspire the federal states to implement that institutional option for the road operation management which induces the lowest expenditure. The implementation of such an incentive-oriented resource allocation requires the introduction of a benchmarking system.⁶² The FMTBH already contemplates introducing a suchlike system in the long run.⁶³ Although it stays unclear whether an appropriate benchmarking system can eventually be developed and implemented. The federal states which might loose their information surplus could try to resist being benchmarked.

5 The traditional organisation model of the operational service on federal motorways – general remarks and the example Brandenburg

This chapter examines the traditional organisation model of the operational service on FM. At first section 5.1 provides a general overview of similarities of all federal states which organise their operational service according to the traditional model. The following section 5.2 contains a case study on the organisation of the operational service on FM within the federal state of Brandenburg as a specific example of the traditional model. Finally section 5.3 delivers a compromising assessment of the traditional model.

5.1 Similarities of the traditional model

Due to the "federal order administration" and the resulting autonomy of the federal states there is no standardised model for the conducting of the operational service within the various federal states.⁶⁴ However, it is possible to note miscellaneous similarities of the service provision by the public authorities.

ORGANISATIONAL STRCUTURE: FROM MINISTRY TO DIVISION

Conducting the operational service on FTR according to the traditional model there is in general a strict separation between the FM and the FR. The service of FM falls into the area of responsibility of the FMMD while the FR are maintained by the RMD. Superior to the divisions are the federal motorway maintenance offices in the area of the FM similar to the responsible road construction offices in the area of the FR. A junction of the organisational separation of the FM and the remaining

⁶² A benchmarking system of the O & M on trunk roads was introduced for instance in Austria; cp. Dirnböck (1997, pp. 33).

⁶³ According to information by Mr Stefan Zirngibl and Mr Gregor Schröder in a conversation on 26/07/2004.

⁶⁴ Cp. Bernhardt (2000, p. 91).

road network usually starts at a medium level and at the level of the responsible federal state department respectively. These federal state authorities act from a hierarchical point of view as a link between the federal state ministries and the FMMD or RMD respectively. The federal state ministry receive as the supreme authority the fundings from the FMTBH for the ensuring of the operational service.⁶⁵ Figure 4 gives an overview of the multi-level organisational structure of the road administration.

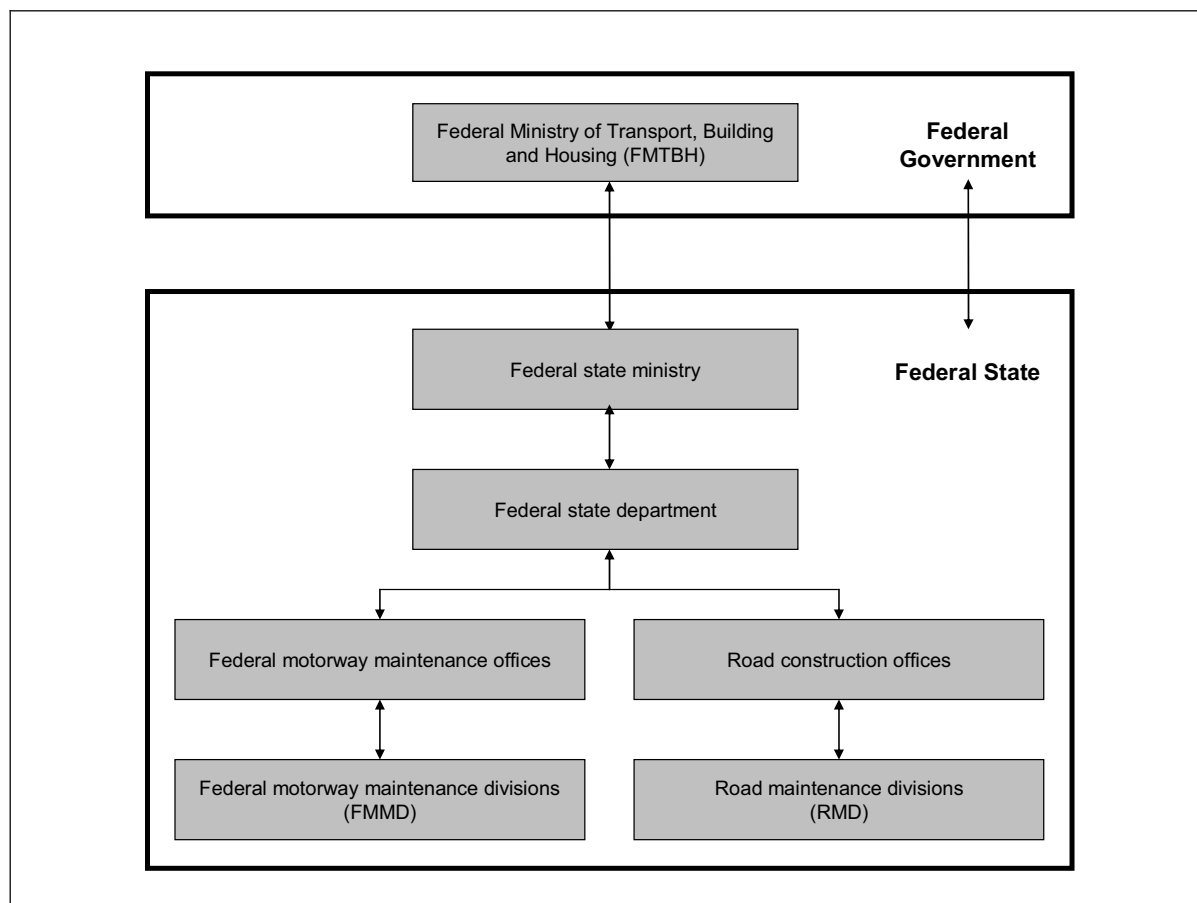


Figure 4: Sample of an organisational structure of a road administration within the federal states (Source: own chart following Mummert + Partner (2002, p. 27))

THE INEFFICIENCY OF THE PUBLIC SECTOR REGARDING O & M ACCORDING TO THE TRADITIONAL MODEL

Within the scope of O & M operational services are mostly provided by the public sector itself, while maintenance especially activities of larger scale are awarded to private companies. In this context the weaknesses of the traditional service provision of the public sector as described in section 3.2 can be noticed as well for the area of road maintenance.⁶⁶

⁶⁵ Cp. Mummert + Partner (2002, p. 27).

⁶⁶ Cp. here as well the criticism of Hanke (2001, p. 12) regarding the traditional model.

- As public companies the divisions have to use the principle of fiscal accounting and are bound to the budget of the federal government as well as to the budget of the respective federal state.⁶⁷ Cost and activity accounting exists at best partially and without the simultaneous use of double entry bookkeeping which leads to the result of insufficient information about existing costs.
- Due to the fact that public employment contract law applies to the public sector the establishment of remuneration systems considering incentives and sanctions for non-compliance are missing in the personnel department. Therefore the incentives of an efficient service provision are small.⁶⁸

5.2 The example Brandenburg

This case study about O & M according to the traditional model within the federal state of Brandenburg firstly describes in section 5.2.1 the organisational structure of the road administration in Brandenburg. Afterwards the organisation of the operational service (section 5.2.2) as well as the organisation of the maintenance and construction activities (section 5.2.3) will be introduced. The different forms of remuneration used in this context will be highlighted in section 5.2.4. Section 5.2.5 concentrates on the bundle of different incentive, monitoring and sanction instruments used within the road administration of Brandenburg, while in section 5.2.6 the usage of the federal fundings is discussed.

5.2.1 Overview and organisational structure of the road administration of Brandenburg

The organisational structure of the road administration of Brandenburg differs just marginally from the previously introduced sample of the organisational structure in the traditional model. The responsible federal ministry is the Ministry of Urban Development, Housing and Transport, which is in addition responsible for the supervision and the political coordination of the concerns of the road administration.⁶⁹ In contrast to the normal structure of the traditional model the federal motorway maintenance office of Brandenburg and the six road construction offices are directly responsible to the Ministry of Urban Development, Housing and Transport.⁷⁰ The federal motorway maintenance office of Brandenburg plans and prepares the new and extension road construction measures as well as the maintenance measures and is in addition responsible for the supervision of the operational service of the twelve FMMD, which maintain a total length of 791 km. The O & M of the 2,809 km FR is handled by 33 RMD, which are directly responsible to the road construction offices.⁷¹ The medium-level instance, the State Department for Building, Transport and Road Affairs carries out planning,

⁶⁷ Cp. Bernhardt (2000, pp. 92).

⁶⁸ Ibid. pp. 102.

⁶⁹ Cp. Mummert + Partner (2002, p. 18).

⁷⁰ Ibid. p. 27.

⁷¹ Cp.. Reuter (2004, slide 7) and Mummert + Partner (2002, pp. 18).

monitoring and documentation tasks, without being directly superior to the federal motorway maintenance office of Brandenburg and the six road construction offices.⁷² Figure 5 gives an overview of the organisational structure of the road administration of Brandenburg.

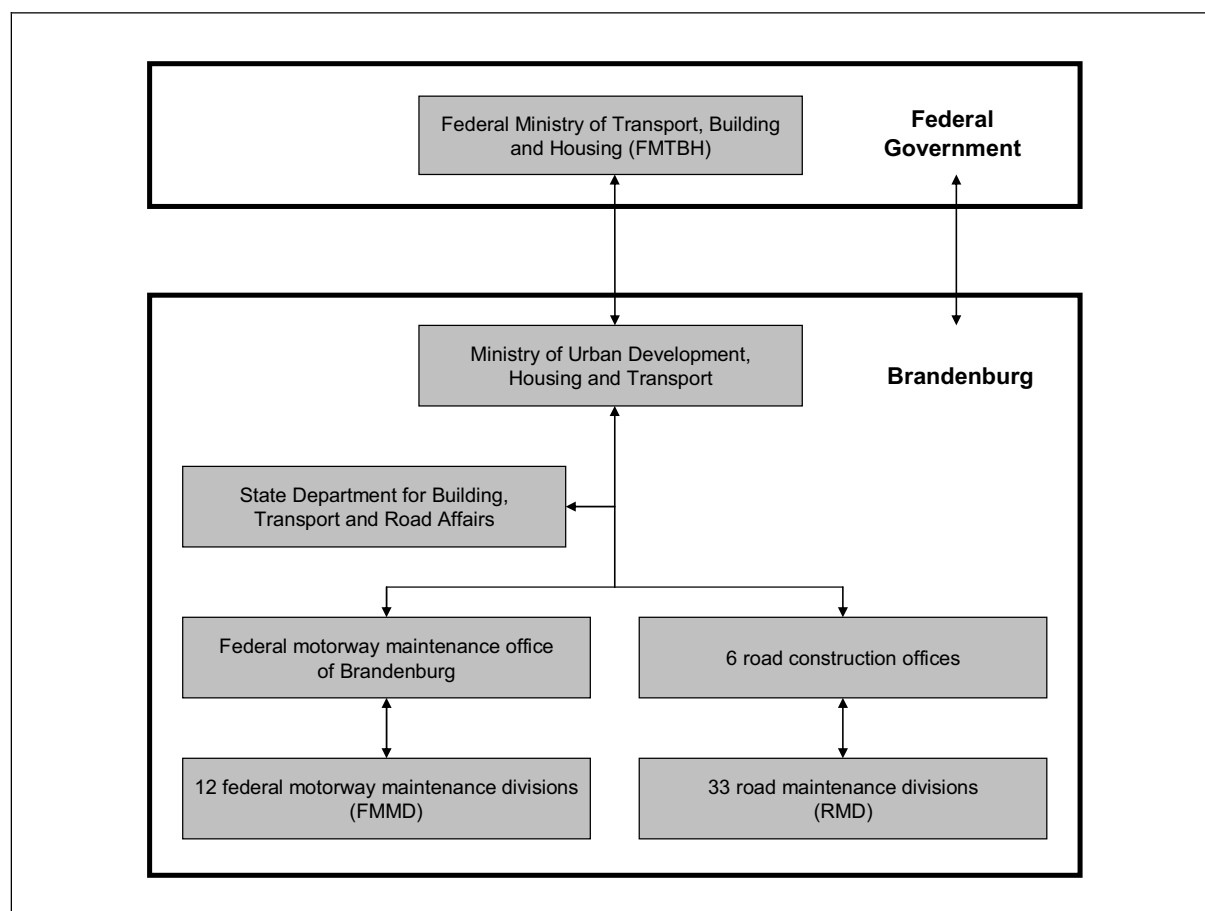


Figure 5: Organisational structure of the road administration of Brandenburg
(Source: own chart following Mummert + Partner (2002, p. 15))

According to this the State Department for Building, Transport and Road Affairs has no authority over the federal motorway maintenance office of Brandenburg and the road construction offices, which means that the Ministry of Urban Development, Housing and Transport directly decides on the recommendations of the State Department for Building, Transport and Road Affairs and as the case may be put changes into place.⁷³ As the State Department for Building, Transport and Road Affairs carries out typical tasks of a medium-level office it is just in exceptional cases able to realise the theoretical possibility of a decrease of the transaction costs as a result of shortening the internal principal agent chain. In fact, problems often occur because of the missing authority regarding the distribution of competencies between the ministry and the local authorities, which results in double work, confusion over competencies and delays. This leads to a decrease of the productive efficiency

⁷² Cp. Mummert + Partner (2002, pp. 16).

⁷³ Ibid. pp. 81.

as well as an increase of the transaction costs. To resolve these problems there are according to MUMMERT + PARTNER (2002) several imaginable possibilities:⁷⁴

- Direct authority for the State Department for Building, Transport and Road Affairs over the federal motorway maintenance office of Brandenburg and the road construction offices.
- The fortification of the local authorities based on task responsibility. This increase of responsibility in the sense of the New Public Management would reduce the necessity of examining and monitoring tasks for the State Department for Building, Transport and Road Affairs and would at least lead to a reduction of the described problem.
- Or the introduction of a state company ("Landesbetrieb"), which organises all operative tasks itself including the examining and monitoring tasks.

At the moment the federal state of Brandenburg plans the implementation of the last option and the introduction of a state company commencing at 01/01/2005. A detailed description of the basic idea of a state company gives chapter 6.

5.2.2 Operational service

The overall organisation of the operational service on the FM in Brandenburg is the task of the federal motorway maintenance office. The whole network length encompasses 791 km of FM with more than 600 bridges. In comparison to the size of the federal state of Brandenburg that means a relatively low network density of 0,029 km per km².⁷⁵ Nevertheless the average size of one FMMD in Brandenburg is approx. 65.9 km which almost meets the average federal size of one maintenance division of 66.5 km.

INSUFFICIENT INFORMATION ABOUT THE COSTS OF THE INDIVIDUAL OPERATIONS

Regarding the individual trades of the operational service it is not possible due to an insufficient cost and activity accounting within the federal motorway maintenance office to give exact figures of their share of the overall costs.⁷⁶ In the same way it is not possible to collect comprehensive data about the costs of in-house service provision and its share of the overall costs.⁷⁷ In theory, the costs of contracted out activities could be reconstructed by evaluating every single contract, which in practice is not done or if contracts are evaluated, insufficient data is recorded. Therefore it is difficult to state any precise comments about the impact of the contracting out of operation services within the federal motorway maintenance office. In the area of the road construction offices a cost and activity accounting exists but due to software problems it was not possible to extend the existing system so that it includes the data of the federal motorway maintenance office.

⁷⁴ Cp. Mummert + Partner (2002,pp. 81).

⁷⁵ North Rhine-Westphalia provides for example a network density of 0,062 km/km² and Hesse one of 0,044 km/km². The federal average network density is 0,034 km/km².

⁷⁶ Cp. section 5.2.5 for the scope of performance data recording within a cost and activity accounting system.

The base for the calculation of the personnel requirements of the federal motorway maintenance office and the FMMD is the complete ensuring of the winter road clearance with own staff.⁷⁸ In this respect the estimated share of in-house service provision is very high because of the large labour resources required during the winter months. Within the scope of operational services solely individual green space upkeep, service and maintenance of street furniture and cleaning services are awarded externally. In the area of service maintenance of street furniture the maintenance of crash barriers, oversized road signs as well as the replacement of accidentally destroyed road signs are assigned to private companies. Further tasks possibly carried out by private companies are the securing of road works and the clearance of accidents if not an immediate removal of the accident is required. Any other services are generated internally. Here are to mention the remaining green space upkeep, service and maintenance in the area of the operational service and in the area of the miscellaneous services any duties as regards cleaning, winter road clearance and urgent measures.

NEGATIVE EXPERIENCES WITH THE CONTRACTING OUT OF CLEANING SERVICES

In the early 90ties the cleaning of toilets of lay-bys were awarded to external companies. The crucial criterion to choose the private companies was the lowest price offered during the tendering process.⁷⁹ Due to major quality problems after the contracting out of this service today's cleaning of toilets on lay-bys in Brandenburg is provided public enterprises again. In principle cleaning is a service which can be described and codified easily and therefore contracting out should not cause any major problems. This leads to the assumption that in the named case the quality problems occurred because of poor selection of the private company, poor contracts and / or insufficient monitoring of the private company. So a failure like this can not mean that (under the assumption of constant quality and with respect to monitoring costs) it is not possible to gain efficiency increases by contracting out cleaning services.⁸⁰

WINTER ROAD CLEARANCE AS AN OBSTACLE FOR THE CONTRACTING OUT OF SERVICES?

The low proportion of contracting out within the operational services is founded on the statement that all labour resources have to be fully utilised and that the amount of staff is calculated by the requirements for securing the winter road clearance even in peak times.⁸¹ This raises the question if the contracting out of the winter road clearance is truly not possible. The non-applicability of contracting out in the area of winter road clearance in Brandenburg is justified with the high specific investments in vehicles and the necessary know-how of the employees. However, the experience in

⁷⁷ Cp. Mummert + Partner (2002, pp. 132).

⁷⁸ According to information by Mr Gunnar Loichen and Mr Thomas Schütt made in a conversation on 17/05/2004.

⁷⁹ According to information by Mr Hans-Reinhard Reuter made in a conversation on 04/05/2004.

⁸⁰ Cp. Domberger / Jensen (1997, p. 71).

⁸¹ According to information by Mr Gunnar Loichen and Mr Thomas Schütt in a conversation on 17/05/2004 as well as Mr Hans-Reinhard Reuter in a conversation on 04/05/2004.

Thuringia, which will be discussed in section 7 shows that a contracting out of the winter road clearance is in principle possible.⁸²

5.2.3 Maintenance and construction measures

Surveying in the area of maintenance of roads is predominantly done by the federal motorway maintenance office and the various FMMD.⁸³ Small services and maintenance activities of the roadway are provided internally or are directly awarded to a private company using a fixed price remuneration. In contrast extensive maintenance works as well as reinstatement and renovation measures are mostly competitively awarded in connection with unit price contracts or so called stand-by contracts. Unit price contracts are also used in tenders for the construction of new roads.

5.2.4 Competencies at the awarding and monitoring of services as well as applied forms of remuneration

The federal motorway maintenance office is responsible for the tendering of maintenance services and the few tasks of the operational services which are typically outsourced if the services in questions exceed a value of € 2,500, while services with a lower value are tendered by the responsible FMMD itself. The monitoring of the service provision is carried out by the FMMD. In Brandenburg different forms of remuneration for the external awarding of construction, maintenance and operational measures are applied:⁸⁴

- **Unit price contracts:** The crucial criterion for awarding these contracts is the expected overall price, which is figured out over the calculated quantities. Scenario analyses are not applied. In some cases the calculation of bidding offers is questioned to prevent unbalanced bidding. Furthermore there are no optional positions to avoid speculative bidding. To reduce complexity of contracts unit price contracts often contain lump sum positions, e.g. for the securing of road works. Increasingly services especially maintenance services are awarded through contracts which encompass less unit price position and fewer contingencies.
- **Stand-by contracts:** Frequently the federal motorway maintenance office solicits quotations for individual positions within the scope of so called stand-by contracts. These quotations are only considered if a specific order is supposed to be released in the near future. In these cases the preferred company is identified on the basis of the lowest overall price, which is determined with the assistance of the needed quantities and the offered unit price positions. Normally templates exist for these contracts which also may be adjusted in some cases to meet certain requirements.

⁸² Mummert + Partner (2002, pp. 129) also point out the necessity of winter road clearance with own staff.

⁸³ Cp. Mummert + Partner (2002, p. 52) and according to information by Mr Gunnar Loichen and Mr Thomas Schütt made in a conversation on 17/05/2004.

⁸⁴ According to information by Mr Gunnar Loichen and Mr Thomas Schütt made in a conversation on 17/05/2004.

- **Fixed price contracts:** Only small scale activities on short notice are sometimes rendered with fixed price contracts. Fixed price contracts allow supplements if the quantities deviate more than 20 % from the original calculation. This is supposed to lower the costs of risk bearing of the private companies. To prevent unrealistic offers the tendering authority demands in reasonable cases the disclosure of the quotation costs at the time of the offer.

The experiences in Brandenburg show that unit price contracts possess high importance in practice despite of the existing theoretical problems. In the case of Brandenburg the theoretical problem of strategic bidding behaviour in tenders for unit price contracts are tried to get under control by rather simple means such as the questioning of the quotation costing. These “counteractive measures” can be explained with the relatively low transaction costs involved with this procedure.

5.2.5 Information flow and mechanism of incentives and sanctions within the road administration of Brandenburg

Major shortfalls of the public sector can also be observed within the road administration of Brandenburg. Costs as well as activities are not recorded systematically in the road administration of Brandenburg.⁸⁵ Therefore the cost and activity accounting as the major management accounting instrument should be expanded to improve transparency and the operating efficiency.⁸⁶ An effective cost and activity accounting would allow cost comparisons between internal and external provision of services with the result of a better information flow about costs.⁸⁷ An essential prerequisite for an efficient cost and activity accounting system is an improvement and a standardisation of the available IT-infrastructure.⁸⁸

As regards mechanisms of incentives and sanctions in the area of personnel policy, the possibilities to enforce such mechanisms are limited due to the public employment contract law requirements and political guidelines in Brandenburg. According to a current agreement operational notices of cancellation are not possible until the end of the year 2009.⁸⁹ As well anti-personnel notices of cancellation are unlikely due to the influence of the staff council. In addition the likelihood of shirking in the public sector is increased by missing performance-related forms of remuneration. People in charge within the road administration in Brandenburg mentioned major cost saving potentials if the personnel policy would not be restrained by the public employment contract law and the political guidelines.⁹⁰

⁸⁵ Cp. Mummert + Partner (2002, p. 31).

⁸⁶ Ibid. pp. 57.

⁸⁷ According to information by Mr Hans-Reinhard Reuter made in a conversation on 04/05/2004.

⁸⁸ Cp. Mummert + Partner (2002, pp. 61).

⁸⁹ According to information by Mr Hans-Reinhard Reuter made in a conversation on 04/05/2004.

⁹⁰ According to information by Mr Hans-Reinhard Reuter made in a conversation on 04/05/2004.

5.2.6 Discussion of the usage of the federal fundings

In 2004 the budget accounted for € 22.6 mn for the operational service of the FM in Brandenburg. Over the last few years the available fundings for the operational service on FM were always sufficient.⁹¹ As soon as a shortage of fundings was foreseeable the ratio of contracting out was reduced. According to information of the federal motorway maintenance office a reaction on shortages of funding was the delay of necessary maintenance repairs by the realisation of short-term repairs and the reduction of repairs to a minimum respectively.⁹² This shows on the one hand an inconsistent quality of the service provision on the other hand it illustrates the transfer of tasks which were formerly awarded to external firms onto own employees an under-utilisation of the FMMD.

5.3 Assessment of the traditional model of the operational service in general and in Brandenburg in particular

The consideration of the O & M of FM in Brandenburg as an example of the traditional model verifies the theoretical derived shortfalls of the traditional model of internal services provision by the public sector. Possible increases of the productive efficiency remain unused due to shortcomings of the applying public employment contract law which prevents a sensible personnel policy. Furthermore cost saving potentials are not utilised or remain undiscovered because of a missing or an inadequate cost and activity accounting, a low ratio of contracting out services and the resulting lack of an information flow about costs. Regarding the effectiveness of the operational service a clear conclusion is not possible because the federal government has not yet defined any detailed guidelines with respect to the default requirements. As a result of the poor mechanisms of providing incentives and sanctions in line with a high degree of information asymmetry within the multi-level organisational structure between federal government and the FMMD the reached effectiveness is supposed to be low.

6 Reform efforts for the organisation of the operational service on federal motorways – general remarks and the example Brandenburg

This chapter examines the efforts of reforming the traditional model of the organisation of the operational service on FM, which continue to be operated mainly by the public sector. At first section 6.1 provides a general overview of nationwide developments in this respect, while section 6.2 exemplifies the reform efforts of the federal state Brandenburg. Comprising section 6.3 will conclude with a general evaluation of the illustrated efforts.

⁹¹ According to information by Mr Hans-Reinhard Reuter made in a conversation on 04/05/2004.

⁹² According to information by Mr Gunnar Loichen and Mr Thomas Schütt made in a conversation on 17/05/2004.

6.1 Incorporation of state companies and the formation of mixed divisions

6.1.1 Incorporation of state companies as nationwide predominant reform approach

In the course of the administration reforms several federal states have implemented alternative solutions for the reorganisation of the operational service on FTR. The most commonly used action of reform is the incorporation of so called state companies (“Landesbetriebe”). In North Rhine-Westphalia a state company was founded on 01/01/2001, which is responsible for planning, construction, operation and maintenance of FM, federal, state and a few municipal roads.⁹³ The state enterprise is a “legally dependent and organisationally separated part of the state administration, whose actions are profit-oriented or at least aimed at cost recovery”.⁹⁴ Thus it is directly subordinated to the State Ministry of Transport, Energy and Land Use Planning. The ministry governs the state company particularly via agreements on objectives. Other features of the state corporation are beside a stronger self-responsibility of decentralised organisation entities primarily the existence of a cost and activity accounting. Following the example of North Rhine-Westphalia, state companies were also incorporated in Rhineland-Palatinate on 01/01/2002 and in Saarland on 01/01/2003.⁹⁵ Moreover along with the federal state Brandenburg, Schleswig-Holstein has decided to go over to the model of a state company by 01/01/2005.⁹⁶ Additionally several other federal states intend to reorganise the road operation and maintenance by means of state companies.

6.1.2 Formation of mixed divisions – current debate and locally limited implementation

As another approach of reform in the course of the incorporation of state companies the formation of mixed divisions come to the fore increasingly to allow for utilising synergies between different road categories at the level of production. The only federal state, which has constituted mixed divisions up to now, is Hesse, although this formation was not linked to the incorporation of a state company.⁹⁷

From the point of view of the FMTBH, there are certain synergies between the different types of roads, but to a great extent a variety of different equipment is still needed, so that mixed divisions are not always appropriate and should not become a standard model in Germany.⁹⁸ But the individual examination of potential location sites for merging FMMD and RMD can be absolutely reasonable primarily in metropolitan areas, where the characteristics of FM resemble those of urban motorways

⁹³ Cp. Landesbetrieb Straßenbau Nordrhein-Westfalen (2003, p. 1).

⁹⁴ According to paragraph 14a of the North Rhine-Westphalian State Organisation Act. The same definition can be found in § 13 paragraph 1 of the State Organisation Act Brandenburg. (Cp. Reuter 2004, slide 12.)

⁹⁵ Cp. Landesbetrieb Straßenbau Nordrhein-Westfalen (2003, p. 3) and also Mummert + Partner (2002, p. 153).

⁹⁶ According to information by Mr Stefan Zirngibl in a conversation on 18/08/2004.

⁹⁷ Cp. Hanke (2001, p. 12).

⁹⁸ According to information by Mr Stefan Zirngibl in a conversation on 18/08/2004.

and thus those of FR. Moreover mixed divisions can also come into consideration in far remote areas, where for instance only a short federal motorway section runs through so that a simple RMD can perform the required O & M activities more efficiently.

Prior to the formation of mixed divisions their potentially prohibitive effects on alternative organisation models for the management of the operational service on FM should always be taken into account. After having set up a joint administration for the operational service on FM and the remaining road network, the implementation of concession models and privatisation models respectively, which involve the assignment of the service provision of O & M activities to private corporations, would only be possible by assuming high transaction costs.⁹⁹

6.2 The example Brandenburg

The impulse for reorganising the operational service on FM in Brandenburg was a comprehensive reform process of the state administration, which according to MUMMERT + PARTNER (2002) aims at a complete task and activity evaluation and the layoff of 8,000 administrative staff positions in total by the year 2005.¹⁰⁰ In this respect all the activities of the road administration were put to the test in the course of the official expertise of MUMMERT + PARTNER (2002) for "optimizing the road administration". One of the essential recommendations of MUMMERT + PARTNER (2002) is the transition of the Brandenburg road administration into a state company.¹⁰¹ The implementation of this recommendation is intended to be completed by 01/01/2005.¹⁰² By founding the state company 2,700 jobs shall be laid off in the medium term just within the road administration body and whereby from 2008 on about € 12 mn per year shall be saved in personnel costs.¹⁰³ The tasks of the future state company comprise in analogy to North Rhine-Westphalia the operative activities as planning, construction, operation and maintenance of the FM, federal and state roads as well as optionally selected other road categories.¹⁰⁴ The administrative and to a limited extent the technical supervision as well as political-strategic tasks remain with the Ministry of Urban Development, Housing and Transport.

The Brandenburg state company will be subdivided into the present federal motorway maintenance office and six branch offices for the domain of federal and state roads, the current road construction offices. The formation of mixed divisions is not intended yet, the service of O & M on FM continues to be provided by the FMMD separated from the O & M for the remaining road network, which is

⁹⁹ For a detailed survey on concession models cp. Beckers / Hirschhausen (2003a) and Beckers / Hirschhausen (2003b).

¹⁰⁰ Cp. Mummert + Partner (2002, p. 11).

¹⁰¹ Ibid. p. 162.

¹⁰² According to information by Mr Hans-Reinhard Reuter in a conversation on 04/05/2004.

¹⁰³ Cp. MSWV (2004).

¹⁰⁴ Cp. Reuter (2004, slides 17-18).

performed by the RMD. The incorporation of the state enterprise should result in the following advantages:

- By merging administrative bodies into a state company synergies shall be achieved at the level of administration.¹⁰⁵
- For increasing the efficiency, instruments of the New Public Management shall be applied to a great extent. The junction of technical and resource responsibility with the aid of minimal interfering supervision and management by objectives between the Ministry of Urban Development, Housing and Transport and the state company should provide the state corporation with a higher degree of autonomy.¹⁰⁶
- The introduction of a managerial accounting system including a fully computerised cost and activity accounting should allow for a cost comparison between the in-house service provision by public entities and the contracting out of services performed by private companies and should provide the decision basis for a potential predominance of the contracting out.¹⁰⁷

Regarding the personnel policy modifications of the traditional model as well as the creation of incentive and sanctioning mechanisms within the state corporation are not possible, since the public employment contract law still comes into application.¹⁰⁸

6.3 Evaluation of the incorporation of state companies as reform approach in general and for Brandenburg in particular

With the reform actions in the course of the foundation of state companies essential drawbacks of the traditional model of service provision by the public sector can theoretically be eliminated. The implementation of a complete cost and activity accounting system increases the flow of information about costs as well as the overall transparency. From the point of view of the Federal Government with regard to a possible introduction of a benchmarking system a harmonisation of the several different approaches for implementing a cost and activity accounting would be desirable, since it would enhance the comparability between the federal states.¹⁰⁹ A modification of the personnel policy and the creation of incentive systems as the core components of the New Public Management are not possible in Brandenburg for the short and medium term due to the continuing application of the public employment contract law as well as political guidelines. To which extent other key components of the New Public Management – like the implementation of market and competitive elements by promoting a higher portion of contracting out as well as an internal contract management within the

¹⁰⁵ According to information by Mr Hans-Reinhard Reuter in a conversation on 04/05/2004.

¹⁰⁶ Cp. Reuter (2004, slide 18).

¹⁰⁷ According to information by Mr Hans-Reinhard Reuter in a conversation on 04/05/2004.

¹⁰⁸ According to information by Mr Hans-Reinhard Reuter in a conversation on 04/05/2004.

¹⁰⁹ According to information by Mr Hans-Reinhard Reuter in a conversation on 04/05/2004..

administration in line with the idea of management by objectives – will be able to be introduced depends mainly on their degree of implementation.

However, it has to be doubted whether an advanced break-up of old-grown structures within the administration will be possible in view of the still lasting restrictions for the public employment policy. On this account it remains to be seen if the theoretically derived improvements of efficiency and effectiveness can be realised in practice by founding state companies.

7 Contracting Out of the operational service on federal roads and state roads: the example Thuringia

In Thuringia, in contrast to other federal states, the reform of the O & M on FR and on state roads is based on a transformation of former public RMD and administrative units into a company of limited liability and its privatisation together with a complete contracting out of all trades of the operational service. In this chapter the collected experiences with the contracting out of operational service of roads will be presented in depth and evaluated afterwards. As the winter road clearance service for both FR and state roads is contracted out together, state roads will be included into examination. The road maintenance is going to be involved only if interdependencies to the operational service exist.

Firstly in the course of this case study, section 7.1 will describe the initial position, the motivation and the procedure of the administration for the reorganisation as well as the structure of the present model for the operational service on FR and state roads. This part will also put a focus on the process of the privatisation of the Service and Maintenance Corporation of Thuringia Ltd (Thüringer Straßenwartungs- und Instandhaltungsgesellschaft mbH – TSI GmbH) emanated from former public RMD. Subsequently in section 7.2 the used types of contracting-out agreements and the process of contracting-out will be illustrated and evaluated. Section 7.3 again will deal with the effects of contracting-out of FR on the relation of the federal state Thuringia and the Federal Government. Furthermore the operation on several newly built sections of the Thuringian federal motorway network was contracted out in long term agreements, which will be investigated in section 7.4. Concluding, section 7.5 will close this chapter with an overall assessment of the contracting-out of road operation in Thuringia.

7.1 The initial position and the reorganisation of the operational service of roads

7.1.1 Old-fashioned organisation as well as motivation for modifications and the needed course of action

ORGANISATIONAL STRUCTURE PRIOR TO THE REFORM OF THE OPERATIONAL SERVICE

Until 31/12/1996 the organisation of the O & M was structured according to the traditional model. The Thuringian State Department for Road Construction (TLSB) was incorporated hierarchically between the responsible federal ministry – The Thuringian Ministry of Economics and Infrastructure (TMWI) –

and the federal motorway maintenance office as well as the seven road construction offices.¹¹⁰ The operative tasks of the operation and maintenance service of roads were assigned to the four motorway and 28 road maintenance divisions, which were subordinated to the motorway and road maintenance offices.¹¹¹

REFORMATIONAL IMPETUSES AND DEVELOPMENT OF IMPLEMENTING ALTERNATIVES BY MEANS OF RESEARCH STUDIES

The first steps of the reorganisation of the operational service in Thuringia goes back to the year 1995, when in May the Thuringian Ministry for Economics and Infrastructure instructed DURTH ET AL. (1996) to develop a preliminary study investigating the potentials of rationalisation of the O & M in Thuringia.¹¹² Reasons were the scarcity of budget resources and the related political guidelines of the Thuringian government codified in the Budget Act of the Free State Thuringia 1996 which arranged for a reduction in staff at the federal motorways and road maintenance divisions.¹¹³ Hence, in spring 1996 a first round of 110 positions (12 at the FMMD and 98 at the RMD) and later on further 180 jobs at these divisions should be cut.¹¹⁴

Thereupon ROLAND BERGER & PARTNER (1996b) – by order of the TMWI from August 1996 – developed an implementation concept for the reorganisation of the Thuringian road administration.¹¹⁵ The essential part of the recommendation by ROLAND BERGER & PARTNER (1996b) was the formation and the subsequent material privatisation of a limited liability corporation, which should assume responsibility for the operational service tasks on federal trunk and state roads.¹¹⁶ The portion of activities of the operational service, which would be assigned to the limited company without a competitive tender, should be reduced gradually in a transition period to expose the company to increasing competition without jeopardising its existence in the time of conversion.

¹¹⁰ Cp. Roland Berger & Partner (1996a, p. 6).

¹¹¹ Cp. Durth et al. (1996, p. 5).

¹¹² Cp. Durth et al. (1996).

¹¹³ Ibid. p. 1.

¹¹⁴ In July 1995, 70 employees and 805 workers were employed in the Thuringian road maintenance agencies, so that *ceteris paribus* the supervision ratio of the 28 agencies would have deteriorated from 9.1 km per worker to approx. 13.6 km per worker in average depending on the allocation of the savings decisions of the second round to motorway and road maintenance divisions (Cp. Durth et al. 1996, pp. 6, 18 and appendix 19).

¹¹⁵ Cp. Roland Berger & Partner (1996b). Prior to the final, report a preliminary study was already published, cp. to this Roland Berger & Partner (1996a).

¹¹⁶ Cp. Roland Berger & Partner (1996b, pp. 8). Both studies ROLAND BERGER & PARTNER (1996a) and ROLAND BERGER & PARTNER (1996b) left out an economic analysis of the different institutional arrangements for the operational service (in-house production, contracting-out etc.). Presumably it was taken for granted that privatisation and contracting-out always bring about cost savings.

7.1.2 Overview of the new system and the reorganisation of administration

The recommended solution for the creation of a limited liability company was realised by the delegation of the operational service tasks to the TSI GmbH on 01/01/1997.¹¹⁷ Through outsourcing of the operational service on FR and state roads to a limited corporation (GmbH), the scope of activities changed for the administration which called for an adjustment of the existing organisation.¹¹⁸ Along with the current range of operations several new activities were added primarily the management of the tender procedure, the awarding of contracts, the monitoring and billing of services of the TSI GmbH and other contractors as well as further sovereign duties.

Due to the complete contracting-out of the operational service, the former RMD became dispensable and could be suspended, whereas the entire staff was taken over by the TSI GmbH or the administration as the case maybe. Sovereign duties of the RMD had to be reassigned within the administration to the Thuringian State Department of Road Construction (TLSB) and the remaining four road construction offices respectively, which are subordinated to the TLSB. Each of the road construction offices is responsible for four to five of the total 17 rural districts in Thuringia.¹¹⁹ The 17 rural districts are equivalent to the 17 areas in which the individual trades are now contracted-out separately. Each area has in average one district engineering officer, two road surveyors as well as two road work officers, which bear the responsibility for the operational tasks of the remaining sovereign duties. The road surveyors are in charge of the monitoring of road condition, whereas the road work officers assume supervision of road work sites. With a length of 1,950 km FTR in total and 5,492 km of state roads, each of the 17 areas accounts for an average of approx. 400-450 km per area which is far above the 263 km per RMD in July 1995, just slightly more than a year before the reorganisation.¹²⁰ The O & M of the FM in Thuringia works mostly in compliance with the traditional model, with the exception of the Thuringian federal motorway maintenance office which was closed and incorporated into the TLSB including its subordinated administration and FMMD.¹²¹

7.1.3 The privatisation of the TSI GmbH

After the formation of the Service and Maintenance Corporation of Thuringia Ltd (Thüringer Straßenwartungs- und Instandhaltungsgesellschaft mbH – TSI GmbH) in November 1996 as a wholly owned corporation of the federal state Thuringia, the limited company was assigned to the operative tasks of the operational service on FR and state roads in Thuringia as from 01/01/1997.¹²² Immediately TSI GmbH modernized its vehicle fleet in the framework of service leasing contracts, which imply the maintenance of the leased automobiles by the lessor. Moreover the real estate

¹¹⁷ Cp. Roland Berger & Partner (1997, p. 5).

¹¹⁸ Ibid. pp. 25.

¹¹⁹ According to a statement by Mr Uwe Drescher made during a meeting on 26/05/2004.

¹²⁰ The values originate from 01/01/2004; cp. TLS (2004) and Durth et al. (1996, p. 5).

¹²¹ According to a statement made by Mr Lutz during a meeting on 04/06/2004

¹²² Cp. TSI (2004, p. 2) and Roland Berger & Partner (1997, p. 9).

concept was adapted by merging the former 28 RMD to only 17 operating sites.¹²³ Considering the manning level, all employees from the RMD were adopted by the TSI GmbH, with the result that TSI employed 597 workers in 1997.¹²⁴ In the course of modernisation of the car pool and further measures of rationalisation and restructuring, the net working hours per employee could be increased in average from 4.0 h to 6.5 h according to information by TSI GmbH, which allowed for a reduction in staff to 380 employees at present. Provided that the path of improving productive efficiency can be continued, it is intended to cut back staff numbers down to 330 employees by the end of 2004. The realisation of cost saving potentials was hampered by the application of the restrictive public employment contract law, which arranged for remuneration of employees according to the 'Bundes-Angestellentarifvertrag' (BAT) – the German civil service pay scale – and of workers following the 'Manteltarifvertrag Ost' (MTLO) – the sector-wide collective agreement for the public service workers in the Eastern part of Germany. The TSI GmbH attained after long-lasting negotiations with the ÖTV – the trade union for public service workers – the conclusion of a company agreement in September 1998, in which the wages and salaries are linked to the level of the collective industrial agreement of the building sector. Furthermore elements of performance-linked payment could be incorporated, which allowed for an up- and downgrading of several wage groups increasing the incentives for employees.

The privatisation process of the TSI GmbH was completed with the material privatisation executed on 01/01/2002.¹²⁵ In the course of a bidding procedure, a consortium, consisting of Bickhardt Bau Thüringen (Schwabhausen), Poßögel & Partner Straßen- und Tiefbau (Hermsdorf) and STRABAG (Cologne), took over TSI GmbH for approx. € 900,000.

7.1.4 The change for competition of contracting-out

Following ROLAND BERGER & PARTNER's (1996b) recommendation, the portion of contracts awarded directly to the TSI GmbH was reduced step by step.¹²⁶ At present about 63% of the total scope of services are assigned directly to the TSI GmbH without a competitive tender.¹²⁷ Whereas on FR all trades are advertised for bids in each of the districts, on state roads all summer trades, i.e. trades with the exclusion of the winter road clearance, are awarded directly to the TSI GmbH.¹²⁸ The winter road clearance on state roads is advertised along with the FR to make use of synergies between the two types of roads. Starting from January 2005, also on state roads all trades will be tendered competitively.

¹²³ Cp. TSI (2004, p. 3).

¹²⁴ According to information by Mr Ludwig Winter and Ms Annette Dietrich during a conversation on 26/05/2004.

¹²⁵ Cp. Humborg (2004, p. 115).

¹²⁶ Cp. Roland Berger & Partner (1996b, p. 10).

¹²⁷ According to information by Mr Uwe Drescher in a conversation on 26/05/2004.

¹²⁸ According to information by Mr Ludwig Winter and Ms Annette Dietrich as well as Mr Uwe Drescher during conversations on 26/05/2004

7.2 Detailed analysis of the contracting out – structure, risk allocation and award of contract procedure

This subchapter focuses on the examination of the contractual relationship between the federal state Thuringia and the service providers, i.e. TSI GmbH and other private companies. Therefore the classification of trades which are contracted out regularly in Thuringia will be illustrated in section 7.2.1. Afterwards in section 7.2.2 the used forms of remuneration will be surveyed, while in section 7.2.3 the procedure of awarding contracts to the individual trades will be discussed. Lastly in section 7.2.4 the special features of contracting out the winter road clearance service will be highlighted.

7.2.1 Structure in detail

The classification of trades in Thuringia differs in some points from both the current task catalogue of the operational service by the FMTBH as well as the categorisation applied in this report. Within the scope of contracting out, the following six trades are presently advertised for bids separately in each of the areas:¹²⁹

- Winter road clearance,
- lawn mowing,
- grove maintenance,
- street furniture (e.g.: reflection posts, traffic signs),
- roadway maintenance and
- cleaning work.

The awarding of contracts for the summer trades is effective for a period of one year, whereas the winter road clearance service is awarded for three years. Conspicuously the green space upkeep service is subdivided into the trades 'lawn mowing' and 'grove maintenance'. Moreover the trade 'roadway maintenance' contains classical smaller maintenance workings. Presently the task 'street furniture' includes the immediate measures. Concerning the current classification, the Thuringian State Department of Road Construction (TLSB) shows intentions to reclassify the trades, which includes among others single batch tasks like "immediate measures for roadway repair" and "immediate remedy of obstructions to traffic".¹³⁰ Additionally the maintenance of engineering work shall be contracted out as an extra trade in the near future. Only remaining activities like the monitoring of the road condition would stay in the area of responsibility of the federal state Thuringia with respect to the

¹²⁹ According to information by Mr Uwe Drescher in a conversation on 26/05/2004.

¹³⁰ Cp. TLSB (2004) and according to information by Mr Uwe Drescher in a conversation on 26/05/2004.

legal duty to maintain road safety. Due to the separation of immediate measures from the rest, according to TSI GmbH, the costs of plannable works could be significantly reduced.¹³¹ Table 7 shows the planning to reclassify the trades.

Procedure of tendering and awarding of contract to a third party							Sovereign duties
Averting dangers	Single batch tasks (multi-batch awarding of contracts reserved)						Monitoring of road condition
Remedy of obstructions	Winter road clearance (VOL)		Immediate measures for roadway repair (VOB)	Remedy of obstructions to traffic (VOL)			
Non-plannable workings							
Maintenance of assets	Single batch tasks (multi-batch awarding of contracts reserved)						Fulfilment of the legal duty to maintain road safety
Ensuring functional operability	Lawn mowing (VOL)	Structural maintenance (VOB)	Roadway maintenance (VOB)	Maintenance of street furniture (VOB)	Wood and grove maintenance (VOB)	Cleaning (VOL)	
Plannable workings							

Table 7: Planning of the future task allocation for the operational service in Thuringia (Source: TLSB (2004))

7.2.2 Remuneration regulations, order processing and treatment of principal-agent-problems

7.2.2.1 Choice of remuneration regulations

In general, private entities are remunerated by means of unit price contracts, which list 290 unit price positions combined for all trades.¹³² The remuneration is almost exclusively based on execution, whereas the payment does not depend on the employment of input factors (e.g. working hours) but on the provision of a certain service and a certain output (e.g. snow clearing) respectively. A remuneration based on input factors is applied only in exceptional cases like catastrophes. An remuneration linked to functional demands (e.g. provision of snow clearing in a certain time period) is rare to find.

In 1996, when the privatisation process of the TSI GmbH was initiated, only insufficient information about the amount of the required service was available due to inadequate documentation.¹³³ The

¹³¹ According to information by Mr Ludwig Winter and Ms Annette Dietrich during a conversation on 26/05/2004.

¹³² According to information by Mr Ludwig Winter and Ms Annette Dietrich as well as Mr Uwe Drescher in conversations on 26/05/2004.

¹³³ Cp. Roland Berger & Partner (1996b, p. 11) and also according to information provided by Mr Ludwig Winter and Ms Annette Dietrich during a conversation on 26/05/2004.

performance was recorded on the basis of working hours, so that round figures were known, but for a detailed measuring and billing the change from an input-oriented to an output-oriented activity recording was indispensable.¹³⁴ According to information by the TSI GmbH, 80,000 working hours were required to gather the information needed for a bill of quantities. The TSI GmbH had to disclose the results of its calculations for the settlement of its accounts in the framework of unit price agreements, so that in the beginning of the reorganisation with respect to incentive effects several elements of a cost-plus regulation can be recognized.¹³⁵ According to the TSI GmbH, TLSB and the road construction offices could benefit from the information collected and provided by TSI GmbH to improve the quantity catalogues as well as the terms and conditions of the bidding documents.¹³⁶

According to the TLSB, strategic bids are fairly common in the course of unit price biddings, but the importance of such strategic bidding behaviour – compared to the building sector - is relatively low.¹³⁷ The TLSB aims at reducing the present number of 290 unit price positions, which should primarily decrease the complexity concerning the framing of the unit price contracts, although the probability of renegotiations might increase and the creation of optional positions might be necessary.¹³⁸ Following notions of the TLSB, in the long run services should be awarded on a functional basis and the remuneration ought to be based on fixed price agreements.

7.2.2.2 Order release

By using unit price contracts for the remuneration, incentives for private parties could arise to provide too much of the service, i.e. producing too much quality or too low efficiency. To prevent such misleading incentives the road construction offices release the final orders.¹³⁹ After monitoring trips by district engineering officers and road surveyors, private companies are notified about the required workings. In practice, the private company often informs the respective road construction office about deficiencies on the road, which then if necessary releases the service order.¹⁴⁰ In the course of the order release, in general the road construction office and the service providing company agree upon the scope of the performance quantities.¹⁴¹ To improve the efficiency, the TLSB has ambitions for the medium term to implement a GPS-based computer system which can be used during the monitoring trips by district engineering officers and road surveyors to release orders to the service providers. At present a software company checks the technical feasibility of this solution.

¹³⁴ In 1996, 597 employees worked 922,000 hours, but whose performance could not be related directly to the provided output, according to information by Mr Ludwig Winter and Ms Annette Dietrich in a conversation on 26/05/2004.

¹³⁵ According to information by Mr Uwe Drescher in a conversation on 26/05/2004.

¹³⁶ According to information by Mr Ludwig Winter and Ms Annette Dietrich in a conversation on 26/05/2004.

¹³⁷ According to information by Mr Uwe Drescher in a conversation on 26/05/2004.

¹³⁸ According to information by Mr Uwe Drescher received in a conversation on 26/05/2004.

¹³⁹ According to information by Mr Uwe Drescher received in a conversation on 26/05/2004.

¹⁴⁰ According to information by Mr Ludwig Winter and Ms Annette Dietrich in a conversation on 26/05/2004.

¹⁴¹ According to information by Mr Uwe Drescher received in a conversation on 26/05/2004.

7.2.2.3 Electronic recording of performance data as well as quality and monitoring of service provision

After the provision of service, the quantities are tested prior to acceptance by district engineering officers and road surveyors, usually taking place during the fortnightly inspection of road condition.¹⁴² The total costs for monitoring private companies were underestimated by the TLSB according to its own information.¹⁴³ Despite an adjustment of staff for the tendering process and for the monitoring of private service providers, the administrative costs remained static on the level of 1996.

The billing at TSI GmbH is facilitated by means of an electronic recording of performance data and quantities.¹⁴⁴ The provided quantities are saved on site in a mobile device which can be readout and used later on for invoicing as well as for cost and activity accounting by computer systems. At TLSB, the invoices of the private companies are analysed without the aid of computer systems.^{145, 146} According to market participants, there have not been conflicts so far, at most supplements on a small scale.¹⁴⁷ Although following information of the ordering TLSB, for trades with little controllability the stating of slightly excessive figures cannot be fully eliminated, in general the risk of losing reputation prevents far too high quantity overstatements in the long run. In this context, it has to be noticed that due to the multitude and regularity of bid invitations, the importance of a good reputation is relatively high.¹⁴⁸

With respect to the quality of service provision, hardly any statement is possible. As data material in this regard is not available, assumptions that the quality of the operational service of roads has been deteriorated cannot be either confirmed or disproved.¹⁴⁹ But no significant change in quality has been observed in comparison to road conditions before the contracting out of the operational service.¹⁵⁰

¹⁴² According to information by Mr Ludwig Winter and Ms Annette Dietrich in a conversation on 26/05/2004.

¹⁴³ According to information by Mr Uwe Drescher received in a conversation on 26/05/2004.

¹⁴⁴ According to information by Mr Ludwig Winter and Ms Annette Dietrich in a conversation on 26/05/2004.

¹⁴⁵ According to information by Mr Uwe Drescher stated in a conversation on 26/05/2004.

¹⁴⁶ It should be mentioned at this point that efficiency gains can be realised if the administration pays attention to the necessary compatibility with accounting computer systems used by private service providers when planning the implementation of own computer systems for the invoice management.

¹⁴⁷ According to information by Mr Ludwig Winter and Ms Annette Dietrich as well as Mr Uwe Drescher in conversations on 26/05/2004.

¹⁴⁸ According to information by Mr Uwe Drescher received in a conversation on 26/05/2004.

¹⁴⁹ The FMTBH assumes, that the contracting out of road operation service in Thuringia causes deterioration of quality; according to Mr Stefan Zirngibl and Mr Gregor Schröder in a conversation on 26.07.2004. Also Humborg (2004, p. 118) assumes decreasing quality without reasoning this statement.

¹⁵⁰ According to information by Mr Uwe Drescher received in a conversation on 26/05/2004 as well as by Mr Lutz Irmer during a meeting on 04/06/2004.

7.2.3 Procedure of awarding contracts

Contracts are awarded according to regulations for public tendering procedures and depending on the respective trades following the provisions of the public procurement laws VOB or VOL.^{151, 152} The award procedure has only one stage without a pre-qualifying step. The primary factor for the selection of a company is the bid price level, but also other criteria are taken into account as for instance the local presence, the reliability, the experience as well as the financial and technical strength of the tenderer.¹⁵³ But the exact assessment criteria are not publicly available to the bidders. In the course of negotiations with the tenderers – after the submittal of quotation – additionally to aspects of content, the bidder's skills and qualifications are evaluated. As experience shows, inappropriate bidders can be identified during such negotiating rounds, according to information by TLSB.¹⁵⁴ During awarding procedures following the principles of the VOB in contrary to those following the VOL, bidders are allowed to observe the opening of the offers.

Although the TSI GmbH wins the majority of bid invitations for summer trades on federal trunk roads, presently approx. 60-65 %, the figure shows also that competitors managed successfully to enter this market and that a fair competition in the market segment for summer trades has been evolved. Table 8 illustrates the modalities of the bidding procedure, the intensity of competition as well as the average financial scope of awarded contracts regarding the several trades on FTR.

Trade	Contract period	Average number of bidders for several trades per regional district	Type of bidding / Assessment criteria used	Importance and portion of trades in 1,000 Euro
Winter road clearance	3 years	2	VOL	6,210
Lawn mowing	1 year	6	VOL	700
Grove maintenance	1 year	11	VOB	1,180
Street furniture	1 year	4	VOB	665
Roadway maintenance	1 year	5	VOB	4,550
Cleaning work	1 year	3	VOL	810

Table 8: Modalities and results of contract awards on federal trunk roads

(Source: own chart)

¹⁵¹ VOB - official contracting terms for the award of construction performance contracts. VOL - official contracting terms for the award of service performance contracts.

¹⁵² According to information by Mr Ludwig Winter and Ms Annette Dietrich as well as Mr Uwe Drescher in conversations on 26/05/2004.

¹⁵³ According to information given by Mr Ludwig Winter and Ms Annette Dietrich during a meeting on 26/05/2004.

¹⁵⁴ According to information by Mr Uwe Drescher received in a conversation on 26/05/2004.

7.2.4 Detailed survey of the contracting out of winter road clearance

Basically the winter road clearance consists of four tasks:¹⁵⁵

- Snow clearing,
- winter gritting,
- snow clearing and gritting as well as
- monitoring trips by private company to ascertain the need for winter road clearance.

The remuneration of these main tasks is based each on different kilometre-oriented unit price positions. Additionally there are further unit price positions for separate services, e.g. erecting snow warning signs, which amount to a total sum of 60 unit price positions just for the winter road clearance. One position included stands for the on-call service staff of winter road clearance. Hereby the private company receives a monthly lump-sum for an availability period of five months. The exact starting date of the period of this position is set by arrangement between the private service provider and the responsible district engineering officer at the beginning of the winter road clearance period.

Only for the winter road clearance, no single orders are released. For this trade the obtainable quality is specified functionally in advance. Then, depending on the environmental conditions, particularly the weather conditions, services are provided by private companies if necessary. The provision of this service is based partly on contract agreements, partly on tacit consent between principal and agent. The remuneration is paid according to the activities actually rendered (procedure-based remuneration).

The performance data of services rendered as for instance the amount of scattered salt and grit, the time for snow clearing and / or gritting will be recorded by dint of GPS and a digital map of network knots, so that they can be assigned geographically and chronologically to the according road sections.¹⁵⁶ The application of a satellite-based activity recording for winter road clearance is specified in the contracting terms for the award of service performance contracts which allows for trouble-free controlling of the rendered quantities. However, the district engineering officers and road surveyors have an information deficit regarding the exigency of these quantities. But according to public authorities, private companies exploit their information advantages in this field at worst only to a small extent to preserve their established reputation.¹⁵⁷

¹⁵⁵ According to information by Mr Ludwig Winter and Ms Annette Dietrich from a conversation on 26/05/2004.

¹⁵⁶ According to information by Mr Ludwig Winter and Ms Annette Dietrich as well as Mr Uwe Drescher in conversations on 26/05/2004.

¹⁵⁷ According to information by Mr Uwe Drescher in a conversation on 26/05/2004.

As table 8 shows, in average only two bidders per district apply for the provision of winter road clearance.¹⁵⁸ In 15 of 17 districts, TSI GmbH has won the awarding of contracts for the winter road clearance.¹⁵⁹ Additionally one district award has gone to a managing partner of TSI GmbH, so that the winter road clearance in solely one district area is provided by a competitor of TSI GmbH, which originates from the waste disposal sector. Hence, the results of contract awards indicate a competitive advantage of the TSI GmbH as the incumbent. For promoting the competition, TLSB offers as part of the tendering package the utilisation of the state-owned salt repositories. But the rents are partially very high, as they calculate from a default percentage of the market value of the salt storehouses and not from fair market values.¹⁶⁰ For this reason only about 40 % of the salt storehouses used by TSI GmbH are leased from the federal state Thuringia.

For the tendering TLSB aimed at a five year duration period for awarded contracts, to increase the market appeal for competitors, since with longer contract durations, the readiness of companies to make necessary investments in human capital and equipment rise.¹⁶¹ Whereas the FMTBH regards a contract period of only one year as reasonable due to the existence of a leasing market for machinery.¹⁶² Eventually, TSI GmbH could stand up with its demand for a three year duration period for the winter road clearance.¹⁶³

7.3 Effects on the relationship Federal Government – Federal State

In the context of the contracting out of operation on FR, the question arises, which repercussions on the relationship between the federal state Thuringia and the Federal Government may unfold in comparison to the traditional model. With respect to cost charging, there have not been any dissensions with the national government so far according to information of the TLSB, since the contracts for summer trades on FR are awarded separately and the costs for winter road clearance can be easily allocated to the respective legally and financially responsible bodies due to the GPS-based activity recording.¹⁶⁴ An advantage of the contracting out consists in the improved flow of information about costs. Although TLSB and the road construction offices do not issue a cost and activity accounting, the cost of operation can be taken from invoices of the private companies. However, the Federal Government does not make use of this gain in information about the cost of service provision and continues to allocate budget resources for the operational service on FTR to the federal state Thuringia in the form of a lump-sum, according to the length and number of lanes on

¹⁵⁸ According to information by Mr Uwe Drescher in a conversation on 26/05/2004.

¹⁵⁹ According to information by Mr Ludwig Winter and Ms Annette Dietrich as well as Mr Uwe Drescher in conversations on 26/05/2004.

¹⁶⁰ According to information by Mr Ludwig Winter and Ms Annette Dietrich in a conversation on 26/05/2004.

¹⁶¹ According to information by Mr Uwe Drescher in a conversation on 26/05/2004.

¹⁶² According to information by Mr Stefan Zirngibl and Mr Gregor Schröder in a conversation on 26/07/2004.

¹⁶³ According to information by Mr Uwe Drescher in a conversation on 26/05/2004.

¹⁶⁴ According to information by Mr Uwe Drescher in a conversation on 26/05/2004.

these roads.¹⁶⁵ In practice, the provided resources are utilised almost exhaustively.¹⁶⁶ An essential indicator for the application of funds assigned to the operational service within a fiscal year is the cash position in spring after the completion of the winter road clearance period. Depending on the cost of winter road clearance rendered, the quality for operation of roads will be adjusted. Insofar the Federal Government passes up the emerging opportunities for both a more effective and a more efficient allocation of resources, which arise from the contracting out of the operational service in Thuringia.

7.4 Operation on federal motorways

The majority of the 383 km FM in Thuringia are operated according to the traditional model.¹⁶⁷ Only for two sections of newly built routes, the operation has been contracted out entirely, as the intended FMMD have not been completed yet.¹⁶⁸ On motorway A73, approx. 10 km are affected by the contracting out of operation, while on A38 approx. 23 km have been tendered. Since on the newly built routes in many trades there have not been any tasks yet, the tenders have been limited to cleaning, lawn mowing and winter road clearance. Here, TSI GmbH won all the tenders. Other projects of contracting out the operation on motorways are not planned for the short and medium term.¹⁶⁹ Moreover, due to the Federal Government's scepticism towards the contracting out of operation on motorways, the operational service on FM will be completely provided according to the traditional model after the start-up of the new FMMD. In this context, the TMWI intends to conclude treaties with the adjacent federal states for the O & M of FM, so that within the traditional model at least the enterprise size of the FMMD can be optimized across the federal states.¹⁷⁰

7.5 Evaluation and conclusions

EVALUATION OF THE DEVELOPMENT OF COSTS IN THE RELATIONSHIP STATE – SERVICE PROVIDER

The expenditures for operational service on FR and state roads have not changed yet by introducing the contracting out and the competitive tendering procedure. From an economic point of view, the costs even have lowered, as now private companies have to pay value added tax (VAT) for the entire range of provided services, while in the past only for the purchase of external services by the public authorities VAT had to be paid.¹⁷¹ An evaluation of the effects of contracting out on the productive efficiency of the operation on FR and state roads in Thuringia is not possible, since the exact data for

¹⁶⁵ Cp. Humborg (2004, pp. 118-119).

¹⁶⁶ According to information by Mr Uwe Drescher in a conversation on 26/05/2004.

¹⁶⁷ The number is dated from 01/01/2004; cp. TLS (2004).

¹⁶⁸ According to information by Mr Ludwig Winter and Ms Annette Dietrich as well as Mr Uwe Drescher in conversations on 26/05/2004.

¹⁶⁹ According to information by Mr Uwe Drescher in a conversation on 26/05/2004.

¹⁷⁰ According to information by Mr Lutz Irmer in a conversation on 04/06/2004.

¹⁷¹ In the course of the service provision by the public sector, the responsible bodies paid taxes on purchase without deduction of input VAT for the acquisition of equipment, services, raw materials etc. though the payment was limited to only few expenses of the operational service.

the development of quality are not available. But it can be mentioned, that the quality has not changed – at least not obviously.¹⁷² For a detailed assessment of effects of contracting out on the productive efficiency further studies have to be conducted which show whether the cost savings originate from efficiency gains and / or declines in quality.

TOO LOW INTENSITY OF COMPETITION IN WINTER ROAD CLEARANCE

While for the tendering of summer trades competition exists between the bidders, the experience in awarding of contracts for the winter road clearance indicates considerable advantages for the TSI GmbH as the incumbent in the market for this trade. The fact that one competitor has won a tender for winter road clearance suggests that TSI GmbH is partly limited in its price setting by its rivals, nevertheless the federal state Thuringia should promote stronger competition for the winter road clearance service in the years to come. To attain this objective the introduction of a fixed remuneration position for the provision of equipment within the winter road clearance service would be imaginable. That would reduce the dependency of incomes and profit contribution margins on weather and thus, the risk for companies, which again would lead to an increased rivalry without causing incentive problems. To avoid problems with strategic bidding behaviour, one could think of placing a remuneration position for the provision of equipment into the bidding documents. The tenderers would effect a compensation for the deviation of their costs from the default level by adjusting their bids for the other positions of the tender. A default value for the remuneration position of equipment provision should stay below the level of the actual costs of the bidders for this provision to avoid false incentives and not to prevent companies from providing the winter road clearance service.

Furthermore a too short contract period for the winter road clearance service could be the reason for the strategic advantages of the incumbent, since on the one hand specific investments into the human capital and for the acquisition of idiosyncratic knowledge are necessary and on the other hand transaction costs for the purchase or leasing of equipment and the preparation of bidding documents have to be borne by the new market entrants. If other companies than the TSI GmbH should manage to enter the market, they would also acquire specific knowledge about the operation of roads in Thuringia and the relationship towards the public tendering principal, which again would intensify the competition in the market. Against this background an extension of the contract period should be considered. As also contrary proposals for intensifying the competition are submitted regarding the duration of contracts, longer contract periods could be tested in selected district areas. By benchmarking several districts, a detailed evaluation of this idea would be possible.

Moreover it could be considered to circulate more information regarding the implementation of the required GPS for the activity recording among all bidders, which would additionally reduce the advantages of the incumbent TSI GmbH. Besides, introducing a pre-qualifying stage would increase the intensity of competition. If potential competitors had the certainty, that only a limited number of bidding companies will participate on the last stage of tendering, according to ARNEK (2002), both

¹⁷² According to information by Mr Uwe Drescher in a conversation on 26/05/2004 as well as following information

their chances to win the award of contract and also their readiness to invest time and money for the tendering process would increase.¹⁷³ But it is not clear how strong these effects may be, if only a small number of companies are interested in participating in the tender anyway.

JOINT TENDERING OF TRADES AND / OR FUNCTIONAL TENDERING?

In contrary to TLSB, TSI GmbH favours a joint tendering of different trades, since they claim that considerable potentials for exploiting the synergies between the trades might exist.¹⁷⁴ But there is a trade-off between the realisation of synergies and the intensity of competition in the tendering process, as the complexity of service provision rises for a joint tendering of trades.¹⁷⁵ Moreover the complexity of unit price contracts would increase remarkably. Thus, a joint tender of several trades does not seem to be necessarily reasonable despite possible synergies. This holds true against the background of the anyway lacking competition in particular for the joint tendering of the winter road clearance service together with other trades. Only the grouping of selected summer trades could be surveyed more closely. In addition, TSI GmbH supports for joint tenders the idea of a functional tendering including a fixed price remuneration agreement.¹⁷⁶ Although in that case the incentives for an efficient provision of service would increase, the complexity of service and thus, the risk and the costs of risk bearing for private companies would grow significantly which would lead to a reduction in the intensity of rivalry. Therefore this demand has to be seen critically. Implementing such ideas would only lead to cost savings, if a sufficient competition in the market can be ensured. That again might only be the case in the long run, when similar organisational models and a contracting out of operation in other federal states will have been implemented, so that companies compete in a sufficiently broad market across federal state boundaries.

***EFFECTIVENESS, FLOW OF INFORMATION ABOUT COSTS AS WELL AS INCENTIVES IN THE RELATIONSHIP
FEDERAL GOVERNMENT – FEDERAL STATE***

The budget funds for the operational service on FR in Thuringia continue to be calculated from the default key of financing and are fixed for a fiscal year, so that by fully exploiting the provided budget resources the quality of operation deviates around the defaults of the FMTBH. Hence, from the perspective of the Federal Government, the effectiveness of the operation on FR is as low as in the traditional model, as the federal state Thuringia – regardless of the quality level of the operation of roads – continues to apply for all the available funds and the Federal Government does not conduct a more in-depth analysis of the quality level. The Federal Government does not make use of the flow of detailed information about costs and expenditures, which exists between the public authorities in Thuringia and the service providers and cannot adjust the resource allocation according to the actual

by Mr Lutz Imer during a meeting on 04/06/2004.

¹⁷³ Cp. essay 2 in Arnek (2002).

¹⁷⁴ According to information by Mr Ludwig Winter and Ms Annette Dietrich in a conversation on 26/05/2004.

¹⁷⁵ In this context, statements of the TSI GmbH have to be evaluated carefully, since the interests of the limited company differ from those of the public authorities.

¹⁷⁶ According to information by Mr Ludwig Winter and Ms Annette Dietrich in a conversation on 26/05/2004.

costs. However, this has the advantage that the federal state Thuringia will continue to have high incentives to seek for cost-efficient solutions.

BASIC ASSESSMENT OF THE PROCEDURE FOR THE REORGANISATION

Although there are still potentials of improvement for the contracting out of the operational service on FR and state roads, the basic procedure for implementing the reorganisation seems to be practical. The combination of privatising the TSI GmbH together with the gradual introduction of competitive elements allowed for the transformation of a former public management into a private company. In doing so there have not been any incidents so far that might have caused far too high transaction costs or the non-compliance of the legal duty to maintain road safety. Regarding the portability of these results, there are not any evidences standing against an analogue application for the operation on FM, although an adjustment to the motorway specific conditions would be necessary.

Concluding it should be mentioned that by reorganising the road administration in Thuringia numerous insights in respect of contracting out the operational service were gained, which can provide valuable indications for a reasonable procedural design of a possible contracting out of the operational service in other federal states or on FM. Thus the federal state Thuringia creates positive external effects in terms of generating knowledge. In Thuringia a systematic analysis of the results of the contracting out of road operation has not been conducted yet. Furthermore – according to information by the TLSB – the institution has not been able to find out how the tendering procedure might be improved by testing contract modifications due to the lack of personnel strength. Hence, it can be recommended that more detailed surveys of the Thuringian reforming model have to be carried out.

8 Conclusions from the analysis of the institutional options for the management of the operational service

IMPLICATIONS OF THE CONTRACTING OUT AND THE NEW PUBLIC MANAGEMENT ON INFORMATION ABOUT COSTS, EFFECTIVENESS AND COST-EFFICIENCY

Concerning the institutional option for the management of the operational service, the responsible public authorities can choose between an in-house solution and various types of externally acquired service provision. As shown in the theoretical analysis, more precise information on costs would be available by a contracting out of services, but in practise obtained data is hardly edited and interpreted systematically. By designing contracts accordingly, public authorities would be able to decide whether the tenderers provide services in the required quality and thus effectively. However, exact statements towards the development of quality after the introduction of contracting out are often fairly difficult in reality due to poorly recorded quality data prior to the beginning of tender actions.

The experience in Thuringia indicates that by contracting out an increase of cost efficiency seems to be possible, but which cannot be projected with reasonable certainty. It can be assumed that the details in the design of the contracting out have considerable influence on the end result. Hereby the structures of the contracts, e.g. the included trades, the contract duration and the spatial dimensions, as well as the rule of remuneration are of particular importance.

For the operational service the monitoring of services rendered as well as the examination of the actual need for the service provision, which both is important for the applicability of unit price contracts, can be managed relatively easily, although problems might occur for individual trades. It can be assumed that among the various possibilities of contracting out – particularly in developing service markets – the procedure-based types of remuneration for individual trades seem to be superior to performance-based remuneration for the entire operational service. But it continues to be unclear whether contracting out the complete operational service based on functional requirements combined with fixed price remuneration might be a reasonable option.

In Germany individual federal states, as for instance Brandenburg, attempt realising ideas of the New Public Management to increase the cost efficiency while remaining the in-house service provision. In Brandenburg several steps of reform as the introduction of a cost and activity accounting can be looked upon favourably, but the public sector pass up much potential to reform. Particularly political restrictions aggravate a more efficient and cost-oriented personnel policy.

ECONOMIC POLICY RECOMMENDATIONS: REFORMING THE PUBLIC SECTOR, CONTRACTING OUT ONLY WITH THOROUGH PREPARATION AND ENHANCING THE STANDARD OF KNOWLEDGE

Against the background of ambiguous results, the question arises how the responsible bodies for the FTR, i.e. the respective federal states, shall organise the operational service in the future. Beyond dispute is the fact that an in-house service provision of the public sector approximating the basic ideas of the New Public Management e.g. increasing the information level about costs and enhancing the effectiveness and cost-efficiency, predominates the traditional model.

Transitions towards the contracting out of complete trades or even the suspension of the public RMD have to be prepared with great care. If managed appropriately, as the example of Thuringia shows, the transition does not result in cost increases and at least not in obvious declines of cost-efficiency. But proper planning of the single steps, monitoring of the results of reform and adjusting of contracts are necessary and reasonable to increase cost-efficiency. Moreover various types of contracts should be applied and evaluated afterwards to identify the optimal structure by a comparative analysis. The Thuringian experience demonstrates that for contracting out the operation there is no need for an oversized administrative organisation, whereas in Thuringia probably a little bit too less funds are appropriated for planning, evaluating and advancing the tender contracts. Additionally a fast information interchange within the administrative organisation should be enabled to improve the overall bidding procedure based on the previously gathered experience.

For implementing a contracting out elsewhere, the Thuringian procedure for privatising the limited corporation TSI GmbH can serve as a paradigm for transferring public RMD to private entities and for the gradual transition to competition. On the international stage, to some extent even public service providers, which are often subordinated to regional authorities, compete for the management of

operation on trunk roads.¹⁷⁷ Due to the positive experience in this respect, this option should be considered more closely for Germany.¹⁷⁸ In this way cost increases can be limited for the public sector, if a low intensity of competition or even monopoly positions of individual private companies might loom. Therefore the public authorities should contemplate not privatising all the production capacities at once and to keep some of them, which still can be disposed later on. However, also several drawbacks are involved if public entities participate in competitive markets. Insofar it cannot be satisfactorily conveyed to private competitors that a permanent market will emerge, they will not even enter the market. That is why the simple participation of the public sector can be the reason for a lack of competition itself. Following this approach, the contracting out would converge with the idea of the New Public Management, which demands to foster competition with private service providers as an essential aspect for achieving efficiency gains in the public sector. Against the background of these numerous unanswered questions it becomes clear that public authorities should advance their standard of knowledge about the pros and cons as well as the appropriate types of contracting out.

9 Discussion about the centralised and decentralised model with regard to the management of the operational service

Up to this point this article has examined the relationship between the Federal Government and the federal states as well as the institutional options for the management of the operational service by the responsible governing level, which by now are the respective federal states in line with the order administration principle. Concluding the light will be shed on the question whether with regard to the management of the operational service it might be reasonable to deviate from this principle and instead to reassign the administration of FTR to the Federal Government. Thereby the national government could decide whether it provides the operational service by public entities in-house or if it awards contracts to private service providers. In this layout referred to as the „centralised“ option, the Federal Government would administer the management of the FTR, in the traditional case of the „decentralised“ alternative the principle of order administration would continue to apply for the management of FTR.

With the aid of the five criteria a comparison of the centralised and the decentralised alternative will be conducted below, hereby the several aspects are always related to cost-efficiency:¹⁷⁹

- **Flow of information about costs and effectiveness of service provision:** In the centralised model the Federal Government would have the control over cost information, the quality and thus the effectiveness of the management of the operational service. Contrary to

¹⁷⁷ For this and the experience with contracting out in Denmark cp. Holmboe (1997) and for the experience in Sweden cp. Österberg (2003).

¹⁷⁸ To give an answer to the question whether and how public entities might compete with private companies for awarded contracts in the operational service, juristic clarification is needed.

¹⁷⁹ These criteria are partly based on considerations of Schüler (2004, pp. 62).

that in the decentralised model certain information deficits would always sustain for the Federal Government, although the contracting out of the operational service by the federal states could create the basis for providing the Federal Government with information of high quality. All in all within the scope of the centralised model the Federal Government could enforce an efficient service provision more easily and would not have to pay the information surplus to the federal states due to the absence of the principal-agent-relationship Federal Government-federal state.

- **Identification of cost-efficient organisational models:** After successfully introducing a benchmarking system the federal states would have incentives to implement the institutional solution for the management of operation with the highest possible cost-efficiency. Although – as discussed in section 4.3 – it is unclear if such a system can be introduced anyhow. Also in the centralised model it would be possible to test different institutional options in several district areas. Against this background none of the models can predominate the other regarding this criterion.
- **On-site knowledge:** In the decentralised model more detailed on-site knowledge could exist, which would allow for a more efficient service provision. However, it can be assumed that also in the centralised model local branch offices would be operated by the responsible centralised institution, so that it can be doubted to identify remarkable differences between both options.
- **Exploitation of knowledge and information exchange:** The analysis of the institutional alternatives for the management of the operational service showed that for a successful contracting out details in the procedure and in the contracts are highly important and thus the authorities issuing the invitation to bid have to be strongly skilled in their field. Within the scope of a centralised model one can assume that the knowledge transfer among regional branch offices works better than among the federal states. In addition specific knowledge could be concentrated in a central entity. Also in the decentralised model a knowledge exchange among the federal states with the FMTBH as the superior governing institution is certainly possible, but which will work out not as good as in the centralised model. In Germany the FMTBH seems to appropriate rather too less funds as to fulfil the role of the coordinating institution properly.
- **Consideration of interdependencies:** The management of the operational service exhibits certain interdependencies between the individual federal states. If in Germany a contracting out across federal state boundaries would be allowed, it could be assumed that more companies would enter the accordingly broader market and the intensity of competition would be higher. Such a concerted action would be rather feasible in a centralised model.

Reaching a clear judgment about the predominance of one of both alternatives just based on the qualitative appreciation of the aspects above is fairly difficult. But more and also the more crucial arguments militate in favour of a centralisation of the administration of FTR with respect to the management of the operational service, particularly the better utilization of knowledge and the better

information position about costs and effectiveness of service provision on the part of the Federal Government. Moreover it is not clear whether in the decentralised solution a benchmarking system could be incorporated, which would provide the federal states with incentives to implement cost-efficient organisational models. Although for the decision between the centralised and decentralised administration of FTR, more aspects have to be taken into account, primarily the implications on the other levels of the value chain as planning, construction and maintenance. Hereby the operation has only a minor significance for the decision between abolishing and retaining the principle of the federal order administration.

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Drescher, Uwe (Senior executive, TLSB – Thuringian State Department for Road Construction): Conversation on May 26th, 2004 at the TLSB in Erfurt. The conversation was held by Thorsten Beckers and Jan Peter Klatt.

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