

THE REGIONALISATION OF PUBLIC TRANSPORT IN GERMANY – CAN SOUTH AFRICAN PUBLIC TRANSPORT BENEFIT FROM THE GERMAN EXPERIENCE?

A Albers and R Del Mistro

Department of Civil Engineering, University of Pretoria, Pretoria, 0002

1. INTRODUCTION

Regionalisation of passenger rail transport in Germany has become a keyword in any discussion on public transport. The main reasons for reorganising public transport in Germany were the unsatisfactory economic results of the German railway, the problems in public transport which resulted from the reunification of Germany and the deficiencies in rural public transport service. These factors provided the stimulus to improve public transport services in a way that would foster patronage and improve public transport quality to meet the standards of competing modes of travel. (DVWG 1999, Aberle 1998; Lindemann and Oelschlager 1998)

In this paper it is intended, after a short description of the situation in Germany at the time when the decision was taken to regionalise rail- (and road-) based public transport, to describe eleven functional aspects where this strategy has had an effect. The paper concludes with a discussion on the lessons that can be learnt which might be applicable in South Africa.

2. SITUATION OF PUBLIC TRANSPORT IN GERMANY

After a steady decrease in population during the late seventies and early eighties, population increased by 8,3% between 1988 and 1996 to 66,6 million inhabitants in area of the former Federal Republic. While the population in the area of the former German Democratic Republic decreased by 7,5%, the total population of Germany grew from 79,8 million to 82,0 million between 1990 and 1996. The growth in population in the urban regions resulted in the demand for more efficient public transport services.

The car ownership rate increased to 455 vehicle/1000 people for eastern Germany and 510 vehicle/1000 people in western Germany in 1996. It must be mentioned that the total number of vehicles in Germany increased by approximately 23% during the nine years between 1989 and 1998. This posed a serious threat to public transport usage.

To put this into context, it can be noted that in 1996 the number of workers was 34,5 million, the number of pupils and students (which because of their lack of car availability contributed considerably to public transport passenger figures) was 11,7 million, and the number of unemployed was 4,0 million.

The following socio-economic aspects had an effect on public transport:

- ◆ Growing population in western Germany and decreasing population in eastern Germany.
- ◆ On-going and rapid increase of car ownership in both parts of Germany.
- ◆ Increasing unemployment rates.
- ◆ Stable pupil and student figures.

The total number of passenger trips was 59,5 billion in 1996 with 9,3 billion trips by public transport. This represents an increase of 13,4 % in total trips and a decrease of 8,5% in public transport trips compared to 1988

In Germany, 16,6% of the total area was classified as “conurbation”, which accommodates 43,5 % of the population and accounts for 63% of all public transport services.

In 1996 public transport services were provided by 5 groups of operators,

- ◆ Transport companies run by local authorities,
- ◆ Privately owned railways,
- ◆ Private transport companies,
- ◆ Regional transport operators (incl. buses operated by the German railway company) and
- ◆ *Bundesbahn Deutsche* (German railway company).

The transport companies run by local authorities and the German Railway had the biggest share of the passenger trip volumes amounting to 33 billion pass-km and 31 billion pass-km respectively, while the three other groups provided between 5 and 9 billion pass-km each.

3. RAILWAY STRUCTURAL REFORM

In 1989 the Federal Government commissioned an in-depth investigation into the situation of German Railway with regard to its disastrous financial losses and its declining share of the transport market. As a result it was decided to implement the *Bahnreform* (Railway Reform) aimed at:

- ◆ Boosting rail transport’s share in future transport growth.
- ◆ Converting the state-owned railways into an efficient competitive company.
- ◆ Complying with EU regulations in terms of:
 - Entrepreneurial independence of the railways.
 - Separation of operation of infrastructure and operation of services.
 - Financial recovery of the railways.
 - Opening of infrastructure to others.

It was obvious that a clear separation was necessary between those transport services which can be provided in a way that was economically viable and those services which are a service to the community and which need to be subsidised.

Furthermore, the provision of infrastructure for public transport had been the responsibility of the Federal Government. By transferring the regional rail transport from the federal to the provincial tier of government, the allocation of these funds had to change accordingly.

The Federal Government decided in 1993 to privatise the German Railways and to transform it into the *Deutsche Bahn AG* (DBAG), with the Government being the only shareholder. The assets of the *Deutsche Bundesbahn* were divided into independent organisations for:

- ◆ Passenger transport (long distance)
- ◆ Freight transport
- ◆ Regional passenger transport
- ◆ Infrastructure.

In the course of the Railway Reform, the regional rail passenger transport was transferred from the Federal Government to the provincial governments.

4. REGIONALISATION

4.1. Accumulation of public transport responsibility on provincial level

Local transport authorities had often complained about the quality of passenger transport services in their areas (particularly in rural areas); including poor timetables, insufficient services during peak hours and lack of integration into other public transport systems. As such the responsibility of regional authorities for regional rail transport had to be increased. Eventually, the Federal Government devolved the responsibility of regional and local urban transport completely over to the *Bundesländer* (provinces); which could choose different ways to fulfil this responsibility.

This transfer of responsibilities to the provinces necessitated a restructuring of public transport. Transport had been provided by state-owned organisations and was highly subsidised to provide services for which hardly any alternative was available. After German reunification, private vehicle ownership increased rapidly, resulting in an uncompetitive public transport system, while at the same time the road infrastructure became inadequate.

By the end of 1995, the provinces (except Hamburg) had introduced their own provincial public transport legislation (German DOT 1999). The major aim of this legislation was to ensure that:

- ◆ The responsibilities for the whole of public transport were concentrated in one authority,
- ◆ In future public transport would be open to competition, by separating the political level (where the transport services are specified and procured) and the operator level (where transport services are delivered),
- ◆ Negotiations with the major rail transport provider, the DBAG could be more successful.

The provincial public transport legislation also determined how the responsibility for public transport authority was distributed within the *Bundesland*. Depending on the spatial structure of settlements in the province and on the existence of effective transport organisations (e.g. *Verkehrsverbände* in the Ruhr Region), responsibility was either transferred to the local level (cities and districts or their joint organisations) or kept at the provincial level (e.g. in Bayern) (sometimes with the option to transfer the responsibility partially or entirely to the local level at a later stage).

The degree of the delegation of responsibility for public transport by the provinces can be grouped into three categories; namely:

- ◆ Responsibility for rail delegated to the regions; be they urban areas or districts
- ◆ Province retains responsibility until regional authorities are in place to take on the responsibility
- ◆ Provinces retain the responsibility for rail.

Even within this structure provinces have generally elected that major urban areas that already had a functional transport authority should retain that authority, i.e. that the responsibility for rail in those areas remain/be allocated to that authority (e.g. Hanover, Brunswick, Stuttgart). There should be some common logic in the structure of the legislation adopted by the provinces. It would appear that

besides the normal political processes that would be in play in these circumstances, the devolution of authority is probably considered appropriate where one or more of the following conditions exist:

- ◆ An urban area is large enough to have the critical mass to also manage a rail enterprise
- ◆ There exist clusters of urban areas in the province within which commuting occurs and which over time will probably find the need to form closer associations within each cluster to ensure improved public transport services
- ◆ Where there is not a single major centre in a generally rural province

Besides existing transport authorities on the level of coherent transport regions; towns and districts now in charge of rail transport for the first time established further organisations on an intermediate level between the local and the provincial level. For example, the town of Soest (50 000 inhabitants) together with four more cities and a district form their transport authority (Zweckverband SPNV) for rail transport as one of nine co-operation areas in Northrhine-Westfalia. Towns and districts retain responsibility for road-based transport and care for an integration of different public transport modes in terms of time-tables, fares and passenger information (Wutschka, 1999).

4.2 Financing Public Transport

The total annual turnover in public transport amounts to DM 40 billion; equalling approximately DM500/person/year (Ewers and Ilgmann 2000). Nearly one third is spent on regional rail. A little less than a half of this amount is recovered from fares, while the rest is received in the form of subsidies.

The enabling legislation to provide transport infrastructure for the communities is the Local Transport Finance Act, (GVFG) which allocates funds from national level to the local level which are administered by the provinces. These funds are used to build public transport infrastructure (in particular major subway and LRT projects), local roads, and to renew the vehicle fleet towards low-floor technology and modern urban rail vehicles. All funds that are applied for must be complemented by own funding, i.e. 60% national (Local Transport Finance Act), 30% provincial and 10% local funding.

The GVFG is in effect a statutory commitment to public transport. Through the GVFG, funding amounted to DM 6,28 billion in 1996. This amount would be reduced to DM 3,28 billion per year after 1996. These funds are complemented by regionalization transfer funds of DM 8,8 billion in 1996 increasing to DM 12,0 billion in 1997 and to DM 14,7 billion in 2001. Table 1 shows the expected allocation of funds for public transport.

Table 1: Public transport funds (DM Billions) (after German DOT 1999)

	1996	1997	1998	1999	2000	2001
Regionalization transfer funds	8,80	12,10	12,07	12,37	12,70	13,00
GVFG-funds (incl. funds for road building by local authorities)	6,28	3,28	3,28	3,28	3,28	3,28
Overall funds for public/local passenger transport	15,08	15,38	15,35	15,65	15,98	16,28

Furthermore public transport benefits from the 20% of the government funds in the Rail Infrastructure Improvement Fund which has to be spent on regional transport infrastructure.

4.3. Separation of political and operational level

Although different models of organisation of public transport exist, the most common model of organisation of public transport is the so-called three-level model consisting of the *level of politics*, the *level of management* and the *level of delivery* (see Figure 1). The level of politics has been allocated the responsibility for planning and procuring public transport and the administration of federal funds. On this level, the quality of public transport supply is specified and its financing is guaranteed. It can consist of city or district authorities or their joint organisations.

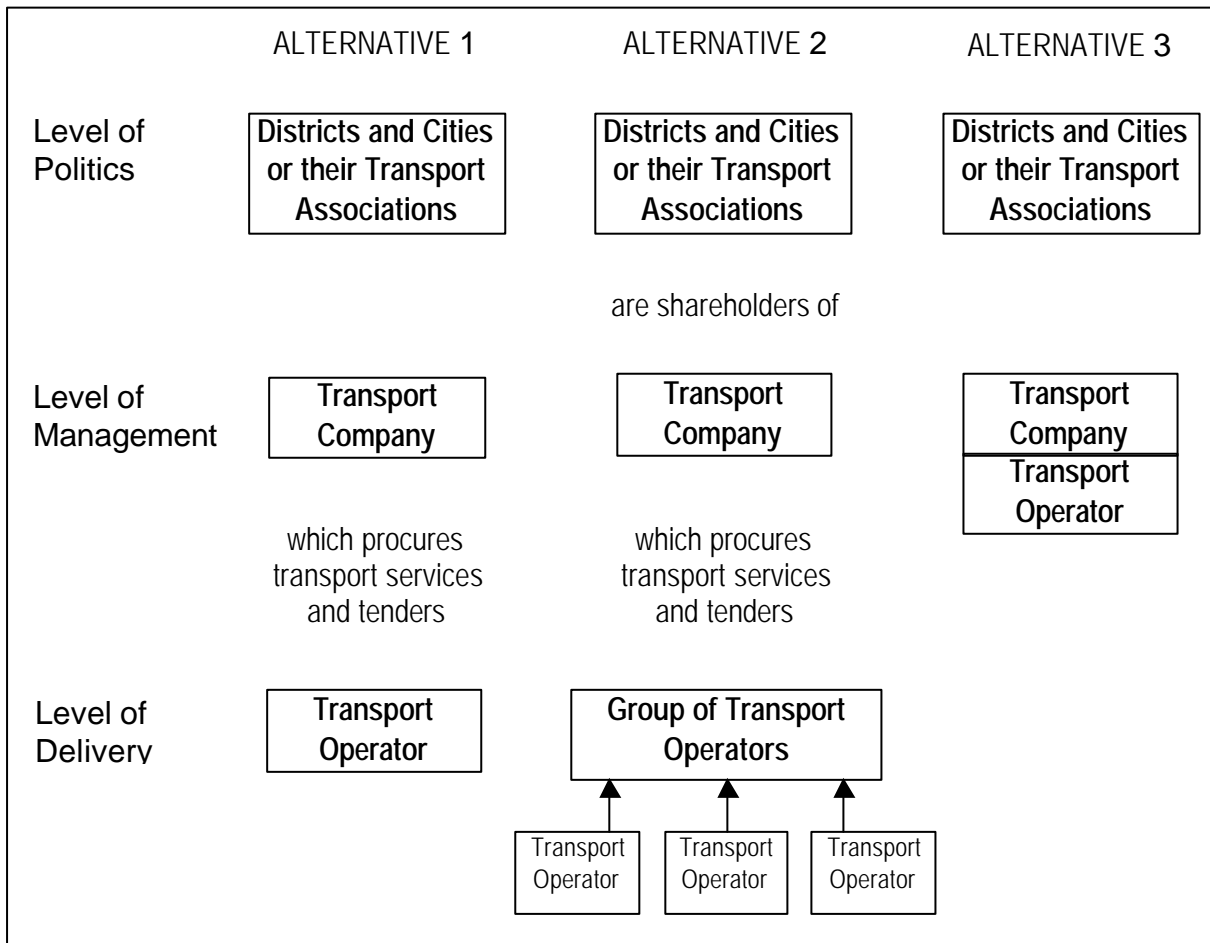


Figure 1: Models of public transport organisation

The middle level of management implements the political targets. It is usually a limited liability company based on civil law with the partners at the higher level being its only shareholders. This level is responsible for continuous development of public transport, marketing and building image of public transport in the area, and tendering by operators.

The level of delivery is where personnel and vehicle scheduling, service delivery, fare management and monitoring of quality is done.

It is also possible to have a four-tier system where the operators group together or a two-tier system where management and delivery are combined. All forms of organisation attempt to ensure the separation of political and entrepreneurial activity.

4.4 Compulsory Public Transport Plan

A most important instrument of the reform is the *Nahverkehrsplan* (Public Transport Plan) which must be prepared by all transport authorities. It requires every authority involved to deliver and agree to a specified analysis of the public transport available and the provision of future public transport services on an agreed basis. Through this, the local and regional tiers have greater opportunities to shape future public transport services.

In most of the areas, besides the local Public Transport Plan for urban and district public transport, a regional Public Transport Plan was also developed to determine the structure and the services to be provided by regional rail transport. Since the two levels, urban/district and regional are much closer than urban/district and national, the co-operation required between the transport authorities has been made much easier by the new legislation.

Regionalisation was introduced on 1 January 1996. The transport authorities had to ensure regional train services by means of contracts with the DBAG, since these services were considered services to communities (i.e. not economically viable). They usually entered into a two-year contract which gave the transport authorities the possibility to prepare tenders for regional rail transport. The first review of regionalization to verify improvements and to monitor whether the allocation of funds had been appropriate was scheduled for 1998 but postponed to 1999.

4.5 Integrated Basic Interval Timetable

The intensive planning for public transport on the provincial and regional levels generally resulted in better public transport supply using the railway as backbone. This was particularly true for the rural areas. A focal point of public transport planning is the integrated basic interval timetable (*Integraler Taktfahrplan (ITF)*). The ITF guarantees rail services on certain lines at defined times during the whole day and during all days of the week. The basic interval is ideally the one-hour interval. Furthermore, the ITF requires that lines meet at certain node stations to offer transfers with short transfer times. Even long-distance trains and urban bus and tram services need to be scheduled on the ITF. The obvious advantage is a reliable transport service with short transfer times and easily remembered departure times. This is especially important in polycentric conurbations.

On this basis, the idea is not only to have an integrated timetable but also to integrate fares, vehicles, stations, information and other aspects (e.g. single livery to promote public transport as a product with common marketing strategies). Since efforts for planning and upgrading of infrastructure are immense, ITF can only be introduced in stages. But with the necessary investment and a systematic “assembly-line”-like production of transport services, the trip costs can be expected to decrease and efficiency to grow.

4.6 New Developments in Regional Rail Technology

Following the introduction of the new public transport legislation, the strict separation of urban and regional rail began to soften where it proved to be useful. The “*Karlsruher Modell*” became famous throughout the world of public transport. It combines tram tracks as well as regional train tracks so that passengers can travel from the region and neighbouring cities to the many destinations in the city of Karlsruhe. This requires dual-system trains and a number of modifications to stations and the signalling system. Before the regionalization, this could only be achieved with exceptional permits from the railway legislation. Regionalization allowed this approach to be implemented in other cities; e.g. Kassel and Saarbrücken; and other cities are also considering implementing of this approach.

On the other hand, tracks with difficult alignment, typical of old railway lines in mountainous terrain, did not permit reasonable speeds to reduce travel times. For these lines, specific trains (e.g. NeiTec) were constructed with car bodies which are steered as a function of the curvature of the track. This allows an increase in the permissible speed of 22% compared to conventional trains.

4.7 Adopting Appropriate Standards for Regional Rail

Since the regionalization of rail transport it has been possible to classify rail tracks more specifically in terms of the sort of transport they carry. Where the track is only used by regional passenger trains, excessive safety specifications (designed for heavy freight transport and high speed train traffic) could be reduced, thereby saving costs without neglecting necessary standards.

Other cost savings can be achieved by reducing design specifications (due to higher vehicle braking rates, alternative measures to absorb forces and to dissipate energy in the event of collision, etc.) and other requirements that could be “down-graded”.

4.8 Tenders and Open Market

The regionalization process has allowed tenders to be called for public transport services; especially for rail services (Table 2). The separation of rail infrastructure and operation opens the infrastructure to any operator capable of providing the requested service. For urban transport “notice of possession” (ownership) was granted for those parts of the public transport which were operating viably. Those services that required public subsidies became subject to tenders.

To date, approximately 10 % of regional rail services have been tendered for. About half of this was awarded to the DBAG, while the other half was awarded to other bidders. The total train kilometres run by regional train services increased by about 10 % from 484 million train-km to 532 million train-km (German DOT, 1999). This proves that since regionalization, more train service is being delivered at the same costs.

Table 2: Calls for tenders in the local public transport sector: Bidders (VDV, 1997)

Current/Possible Bidders
<ul style="list-style-type: none"> ◆ DBAG ◆ Privately owned railways ◆ Privately owned railways/transport companies run by local authorities ◆ DBAG/ transport companies run by local authorities ◆ DBAG/ transport companies run by local authorities / foreign transport companies ◆ Foreign companies

The new allocation of transport responsibilities also ensures that whether a line is to be served by train or by bus is decided by the regional transport authority; i.e. a decision is made by one authority focussed on an integrated public transport service. Between 1994 and 1997, services on 2166 km were discontinued by the DBAG; 259 km of routes were taken over by new operators and some routes were revitalised for private rail transport operators.

4.9 Service Quality Monitored

The separation of the political and the operational level also allows quality levels to be specified in terms of punctuality, cleanliness, safety, equipment, etc. These standards have to be met by the operators who are charged a penalty when they are not met.

4.10 New developments in road-based transport

For road-based transport, the following impacts of the regionalization are evident:

- ◆ Since the rail transport with ITF is meant to be the backbone of public transport as a consequence of the Public Transport Plan, the bus-route network was oriented towards the rail stations and parallel services were eliminated where necessary.
- ◆ For rural areas with very little public passenger transport, new forms of services were introduced under the term of “differentiated services”. These include shared minibuses, request buses (e.g. dial-a-ride) and citizens’ buses (where volunteer-drivers provide cheap transport services using community owned vehicles).
- ◆ Many small and medium sized towns in Germany introduced city buses (*Stadtbus-Systeme*) to connect suburbs and city centre directly. They use modern marketing to promote services and improvements such as low-floor vehicles, attractive stops, easy-to-read information on the service and an easily accessible central transfer station, called “*Rendezvous-Platz*”.

4.11 Other measures to improve public transport and its cost-efficiency

Table 3 contains a list of measures produced by VDV (Association of German Transport Operators) to improve public transport operation and to save cost. Numerous examples already exist where these measures have been successfully applied by local authorities and transport operators.

Table 3: Strategies to improve competitiveness (VDV, 1997)

In-House Measures	Outsourcing	Insourcing
<ul style="list-style-type: none"> ◆ Streamlined hierarchy ◆ Business process organization <ul style="list-style-type: none"> ◆ Work organization ◆ Group-/ Teamwork ◆ Multi-tasking ◆ The Kaizen principle ◆ In-house competition <ul style="list-style-type: none"> ◆ Customer supplier relationship ◆ Organizational units responsible for own activities (in-sourcing) 	<ul style="list-style-type: none"> ◆ Contracting out to third parties (outsourcing) ◆ Contracting out to partly owned subsidiaries (outsourcing to associates) <ul style="list-style-type: none"> ◆ associated companies ◆ joint ventures ◆ Public Private Partnership ◆ contracting out to subsidiaries 	<ul style="list-style-type: none"> ◆ Expansion of existing areas of business ◆ Development of new areas of business
	Combination of outsourcing and insourcing	
<ul style="list-style-type: none"> ◆ Controlling, benchmarking ◆ Total quality management 	<ul style="list-style-type: none"> ◆ Co-operation with manufacturers/suppliers ◆ Workshop co-operation (between transport companies) 	

5. SUMMARY AND CONCLUSIONS

The supply of public transport services in Germany had been split into the German Railway Company (*Deutsche Bundesbahn*) for most of the rail-based services and local authorities and operators for the road-based services (including tramway and LRT systems). The German Railway Company operated with unsustainable losses, which made reform inevitable. The Railway Structure Reform resulted in the separation of public transport into four organisations which can operate independently.

The responsibility for regional transport was transferred from the Federal Government to Provincial Government (i.e. allocated to the *Bundesländer* (provinces)), where the responsibility for all public transport can be held by one authority. By bringing the responsibility to a level closer to the user it was possible to redistribute resources from services that were over-funded to services better able to serve community needs. Federal funds were allocated to enable the *Bundesländer* (provinces) to fulfil their tasks. The major impacts of this process were:

- ◆ Extensive opportunities for the local and provincial level to shape public transport according to their needs.
- ◆ The separation of the political level of specifying and procuring public transport services and the operating level of delivery of services created far more transparency in controlling and monitoring costs.
- ◆ Furthermore, this separation was a pre-condition to open up public transport to competition and thereby to reduce costs.
- ◆ The concentration of transport responsibility in one authority ensures integrated decision making on services (e.g. rail-based or road-based) for a route, and integrated planning of the public transport for an area.
- ◆ Although tendering to-date only comprises about 10% of the rail network, many changes have occurred. New vehicles have been developed and deployed to provide comfortable, fast and cost-efficient services.

- ◆ The public transport supply has increased by 10% and quality has improved (e.g. integrated headway timetables, passenger information systems, differentiated ticketing, etc.)
- ◆ These quality improvements have raised the image of public transport from a neglected service for underprivileged population groups (such as pupils, the elderly and the unemployed) to being an attractive competitor with private transport for many types of trips.

Nevertheless, experts and representatives of transport authorities have justifiable complaints about remaining deficiencies: namely (DVWG, 1999; Ewers and Ilgmann, 2000):

- ◆ The rail vehicle industry was not prepared to deliver the required number of vehicles within the required time (and) to the specifications.
- ◆ The quality of rail infrastructure in rural areas and the cost of providing it is still a complaint of the transport authorities. Funds for improvements to rail infrastructure were mainly used for long-distance tracks and the share allocated for regional tracks was unfair.
- ◆ Local transport authorities strive to improve public transport quality at access points, stops and stations, but co-operation with the *Bahnhöfe AG* is still unsatisfactory.

The results of the regionalization of rail public transport have been positive and trends to privatise road-based public transport are to continue. The pace at which local authorities will privatise road-based transport services and the role of private companies and foreign operators will need to be monitored over the next few years.

From this the following lessons can be learnt:

- ◆ There is merit in having one authority that has responsibility for public transport in an area/region.
- ◆ The political level must be separated from the management and delivery level.
- ◆ The political level should be responsible for setting standards and for making the funds available for subsidising those community services that are not able to totally finance themselves.
- ◆ The management level should be a private company owned by the authorities in the region which it serves. It would be responsible for procuring the services that are required to meet the levels of service specified by the political level.
- ◆ The delivery level should comprise transport operators which might or might not form associations to provide services under tender (or concession?)
- ◆ Providing a public transport service in a region requires funding; especially during the transition between the status quo and the “regionalised” format. This funding will need to be provided by central government and administered through the provinces.
- ◆ Each region needs to prepare a public transport plan.
- ◆ The possibility of simplifying public transport schedules for a regions so that they work on an integrated format with departures at major nodes at at least hourly intervals all day and every day.
- ◆ It is possible to be innovative in the technology that is used; but this needs to be developed to suit the problem rather than finding problems to suit a solution.
- ◆ The standards for rail vehicles need to be re-assessed. If it can be guaranteed that they will be operating on dedicated regional (metropolitan) passenger tracks, this could result in savings in vehicle costs and operating practices.
- ◆ Separating the operators from the managers of public transport in a region results in the need to call for tenders for the supply of services. This should produce savings in the cost of services. However the saving might only be of the order of 10%.
- ◆ Part of the conditions of tender will be a mechanism for monitoring the delivery of service as per tender and an appropriate set of penalties.

- ◆ Where rail is to be the backbone of a public transport system, road-based vehicles must be routed and selected to support this principle.
- ◆ Overseas experience can provide further ideas about ways of providing better public transport services at the same or even lower cost.

REFERENCES

1. VDV- Verband Deutscher Verkehrsunternehmen (Association of Transport Operators) (1997); *Zukunftsfähige Mobilität-Sustainable Mobility, Menschen bewegen- People in Motion*; Alba Fachverlag, Düsseldorf.
2. German Federal Government-Department of Transport, Building and Housing (German DOT 1999); *Bericht der Bundesregierung über den Öffentlichen Personennahverkehr in Deutschland nach der Vollendung der deutschen Einheit* (Federal Government's report on the situation of public transport in Germany after German reunification), Berlin.
3. Deutsche Verkehrswissenschaftliche Gesellschaft (DVWG 1999) (German Transportation Society) (1999); *Drei Jahre Regionalisierung im SPNV-eine Zwischenbilanz* (Three years of Regionalization of Regional Rail Transport – a provisional appraisal) Proceedings of the conference on 14-15 January 1999 in Karlsruhe, Publication No. B221 of the DVWG, Bergisch Gladbach.
4. Lindemann H and Oelschläger D (1998); *Auf neuen Gleisen in die Zukunft: Bahnreformen in Europa* (New rails to the future: railway reforms in Europe); In: *Internationales Verkehrswesen*, Vol.50, No. 7+8
5. Aberle, G. e.a. (1998) (Wissenschaftlicher Beirat beim Bundesminister für Verkehr-Scientific advisory committee at the Department of Transport); *Bahnstrukturreform in Deutschland-Empfehlungen zur weiteren Entwicklung* (Rail structure reform in Germany -Recommendations for further development), In: *Internationales Verkehrswesen*, Vol. 50, No. 6
6. Eisenkopf, A. (1999); *Faire Preise für die Infrastrukturbenutzung* (Adequate charges for using transport infrastructure facilities), In: *Internationales Verkehrswesen*, Vol. 51, No. 3
7. Ewers H-J and Ilgmann G (2000) Wettbewerb im Öffentlichen Nahverkehr: Gefordert, gefürchtet und verteufelt (Competition in short-haul transport: An essential requirement yet feared and maligned), In: *Internationales Verkehrswesen*, Vol 52, No. 1+2
8. Wutschka J (1999) ÖPNV-die Zukunft liegt in einer verstärkten Kooperation (Public passenger transport- the way ahead with increased co-operation) In: *Annual report of Kreis Soest*.