

APPROACH TO THE FUTURE ROLE AND CHARACTERISTICS OF REGIONAL RAILWAY
TRANSIT - CASE STUDY : FEDERAL REPUBLIC OF GERMANY

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1. Background

The invention and introduction of the railways brought a new dimension into the transport system in the course of the 19th century. The speed of travel leapt by about 5-10 times, transport capacity by about 100-1,000 times. The railways constituted the precondition and the motor of the expansion of the industrial revolution. They brought about fundamental changes in the settlement structure and the movement of persons and goods.

After more than a hundred years of successful railway history, another revolution has started to succeed in effecting changes on a similar scale : private car ownership. In the Federal Republic of Germany the number of cars has increased from 2.4 million in the year 1950 to about 30 million today. The road network has been totally renewed and also extended by about 140 thousand kilometers up to a total of 500 thousand kilometers. Between only the years 1960 and 1985 the network of the Federal Highways was extended by 26% and that of the Autobahnen by as much as 228%.

At the same time, the railways rapidly lost their market position :

- the performance position of passenger transit has decreased from 40% in 1950 to less than 7% today,
- that of goods transport has decreased from about 60% to less than 38%.

This development has resulted in a progressive deterioration in the economic situation since the early 1960s. Whereas the fiscal year of the Federal Railways still closed with a balanced result in 1960, the deficit in 1982 reached a level of 4.2 billion DM - in spite of increased subsidies from the Federal government - and the indebtedness reached the amount of 35 billion DM. A continuation of this development would have led to bankruptcy by the end of the 1980s. A fundamental change in the activities and orientation of the enterprise was absolutely essential.

2. Situation of Regional Transit

The organisation of regional transit was inevitably one of the focal points of the necessary changes. In this sector the economic situation was - and still is today - exceptionally poor. Beyond the agglomeration areas, the railways today cover 45% of the passenger kilometers on 80% of their network. The revenue to cost ratio amounts to only 22%, whereas it amounts to 38% accordingly in the densely populated areas.

The main reason for the problems in regional transit are as follows :

- the fundamental changes in the conditions of competition on the transit market, in conjunction with a marked change in the demand profile, and not least
- the fact that the Federal Railways have failed to adjust their supply profile to the changed situation within the framework of their organizational and systematic capacities.

Regional areas are characterized by a relatively low density of population and an wide spread in the demand for transit services. In the Federal

Republic of Germany a quarter of the total population inhabits two thirds of the area. The proportion of housing areas in these parts amounts to less than 5% of the overall community area. In comparison, in the agglomeration area the figure reaches an average of almost 38%. The density of population has shifted substantially within the last 30 years in favor of the agglomerations and away from regional areas.

The railways reacted to the changing conditions as wrongly as automobile planning and policy did until recently, only in the opposite direction. Both adapted only to the changing demand without altering their systematic characteristics. Ever more and ever better roads have been built for automobile traffic. Cities and landscapes have been unscrupulously destroyed, considerable strains have been placed on the environment, road accidents have reached catastrophic levels. 1970 saw an all-time high of nearly 20 thousand deaths and 530 thousand injuries. Since additionally the oil crisis occurred, numerous experts in the transit field judged it to be only a question of time until their undoubtedly more reasonable mode of passenger transport would undergo a great new renaissance followed by improved profitability. However, these expectations have proved to be misleading. The planning means and vehicle techniques in the automobile sector have been improved and extended step by step to reach a level where the necessity of mandatory political intervention is no longer justified.

Nevertheless, the railways continued to react to the decreasing demand in regional areas by merely reducing their services, without changing their antiquated service profile. As a result, the modal split has continued to change in favor of the automobile because of the decline in attractiveness - a vicious circle.

3. Scenario Considerations

In the early 1980s, the Federal government replaced the top management of the Federal Railways. For the new management - some of whom were successful top managers from outside the enterprise - it was self-evident that it was necessary to look for fundamental new concepts in nearly all sectors of the railways' activities. The delegate was asked to assist them, mainly in the field of regional transit. The aspects already referred to above constituted part of his analysis. On the basis of this analysis, it was assumed as unavoidable to undertake systematic considerations about the future boundary conditions regarding the sectors which have - or will have - a significant influence on the railways' range of activities in regional areas.

As to the approach to be adopted for this task, it was decided to choose the instrument of scenario investigations - on the one hand because of the poor results of conventional prognoses, and on the other hand because of the complex nature of the subject.

The main elements in the methodical procedure were as follows :

- Determination of the prevailing sectors of influence.
- Investigation of the sectoral range of development in terms of relevance for the structure of future railway services on the basis of available prognoses, scenarios, own calculations and adaptations to the subject in question respectively.
- Formulation of 3 basic scenario-profiles founded on an integrated analysis and combination of the following sectoral ranges :
 - * scenario tendency
 - * scenario most favorable
 - * scenario most unfavorable.
- In depth investigation of the scenario "tendency" comprising a detailed check as to the extent to which plausible deviations from the tendency

within the sectoral ranges would be of major significance for the derivation of the general approach to a new service profile.

The sectors investigated were :

- population, sociography
- economy/technology/labor
- settlement structure/land use
- energy/environment
- standards of values/traffic behavior
- transport policy
- transport market.

The year 2000 and the "time thereafter" (within a range of 20-30 years) were chosen as the time horizons. Some of the assumptions within the scenario "tendency" regarding the period up to the year 2000 should be outlined below :

- Population/sociography

The number of inhabitants will only decrease marginally; the number of schoolchildren and trainees will decrease by the early 1990s by about 20-25% and increase afterwards up to a level of -15% against today; the number of employees will remain constant.

- Economy/technology/labor

The continuing structural changes in the economy, as well as the increasing introduction and use of new technologies, will not lead to any remarkable changes in the spatial and temporal patterns of transport demand during peak traffic hours, physical communication will not be replaced by non-physical communication; the economic boundary conditions will develop positively at least to such a degree that they will have no unfavorable influence on the trend of reaching a saturated level of car-ownership and on the freedom of modal choice; working and training times will be reduced by about 25%.

- Settlement structure/land use

The process of agglomeration will continue, but with a markedly reduced degree of intensity compared to the last 30 years; fringe-migration into the agglomeration areas will be increasingly compensated by migration back into the city centers; the big city centers will regain their former strength as focal points of trip production and attraction; restrictions on automobile traffic in these areas will be more and more intensified.

- Energy/environment

Neither the price of energy nor its availability will have a noticeable influence on the developments in the transport sector; temporary disturbances are nevertheless not to be excluded; the damaging environmental effects of automobile traffic will be tackled more or less according to the particular circumstances to the extent that thresholds for the necessity of mandating traffic-reducing measures remain unviolated, so that public transit will not profit from it.

- Standards of values/traffic behavior

The private automobile will continue to play an exceptionally important role as part of individual standards of values; furthermore, the latent rational consensus regarding the environmental incompatibility of the automobile will not result in appropriate traffic behavior in terms of modal choice ("everyone wants to go back to nature, but only within his own automobile!"); increased external determination, automation and impersonality in daily life will further the trend more and more towards increased individuality in private life and the demand for comfort, service and personal interaction.

- Traffic policy

The principle "priority for public transit" is still propagated as a cardinal point of traffic policy on all levels; as has been the case to date, however, it will nevertheless be counteracted by the results of a traffic policy which is contradictory within itself insofar as automobile

traffic will be supported to at least the same degree as public transit; over and above this, it is highly probable that tendencies towards liberalization and deregulation of the transport market will result in an increased willingness to reduce social transport services down to the minimum acceptable standard.

- Transport market

The increase in private car ownership will continue without any major friction and reach saturation point by the year 2000 at a level of approximately 5000 cars/1,000 inhabitants; motorized mobility will also increase continuously, but with a much lower intensity; the demand structure will continue to shift in favor of the spatially and temporally more flexible trip purposes (business, shopping, leisure); the demand for public transit services will decrease slightly overall, but will decrease markedly in the rural areas as far as the supply-profile of the competitors will remain more or less unchanged.

4. Approach to a new Profile

In the light of these expectations, two contrary basic strategies have been considered :

- a passive, or defensive, strategy, characterized by a continuation of the adaptation to the fall in demand without any changes in the traditional supply concept, meaning a progressive reduction of the service and closures respectively in favor of bus transit, and on the other hand
- an active, or offensive, strategy, characterized by systematic use of the advantages inherent in the railway system as against its competitors, by reducing its own weaknesses as far as possible and compensating for the unavoidable disadvantage inherent in the system by means of additional services.

The perspective of the defensive strategy was judged to be less promising. The requisite political support for an enforcement of the economically necessary reduction of the services would most probably not be available. Maintaining the antiquated service profile would have meant the continuation of presenting the results of their own failure to react rapidly enough to the changing demand. It would have been no less than a declaration of bankruptcy.

The advice to the Federal Railways and the decision made by its top management was therefore clearly in favor of the active or offensive strategy. The Federal Railways declared their willingness to accept the challenge of competitors on the transport market, in all areas where they are convinced to have chances - and such chances have been seen not least in regional transit.

The necessity of a fundamental change in self-understanding has been identified as a cardinal element in a new approach. To date, the Federal Railways have understood themselves above all as a transport enterprise and part of the Federal state transport infrastructure. In the future they will have to concentrate on being a comprehensive service company on the transport market. This means that their supply-profile will not only have to be orientated towards the mere transport of people, but also towards the wide variety of aspects affecting the demand-profile of the population as regards transport and transport-related services, traffic purposes and traffic behavior, and over and above this, the whole spectrum of influences on the individual's experience of the environment in the context of the movement of people.

The most important modal choice criterion is without doubt the travel time, followed by attractivity. The latter is a very complex criterion, comprising a wide range of factors - comfort and convenience, simplicity in

handling and orientation, minimum physical and psychological discomfort, safety in the social environment, interesting surroundings, modern design, exciting experiences and various other elements. They all have to be taken into account while determining a service profile. Public transit will remain unsuccessful as long as it concentrates on operation, organisation and maintenance. They are the precondition for running a proper public transit service. To be a successful competitor on the transit market requires being active beyond that basic level.

An increasingly service-orientated society demands brandmarked articles, characterized by:

- a clear profile,
- a high standard,
- a corporate identity.

This is also valid on the transit market. The railways must therefore offer brandmarked articles, carefully designed in all their components.

A highly developed transport-market is not based primarily on an "either-or" level in terms of transport modes, but more on an "as well-as" level. Competition does not exclude cooperation. The railways must abandon their fear of contacts with the competitor. They must offer close cooperation through intensified park+ride, kiss+ride, bike+ride as well as the improvement of the operational and physical interchange conditions with the bus services. This is the only way to reach a sensible distribution of functions within the passenger transport sector. In the field of regional passenger transit in particular there are good chances for the railways to profit from closer cooperation.

State railways, like the German Federal Railways, have seen themselves, to date, too much as independent state authorities and acted correspondingly autocratically. They have refused any cooperation with the local authorities exceeding the necessities stipulated by law. As a reaction, the local authorities have not supported the railways in their efforts to improve their economic situation; on the contrary, they enforced claims for better and more services, refusing any participation in bearing the financial consequences or only contributing to them. The realization of a new approach and concept for regional transit requires however—at least in the Federal Republic of Germany—close cooperation with, and the approval of the Federal-State- and local authorities. This is why the state railways must abandon their autocratic attitudes and behavior and offer fair cooperation, otherwise they will have no chance to succeed. The German Federal Railways have accepted this fact and embarked on the necessary measures.

Last year, the first contract between the Federal Railways and a single Federal State was signed regarding the future design of regional railway transit within the boundaries of the respective state; similar contracts with most of the other Federal States are currently being prepared or discussed.

5. Characteristics of the new concept

The new service concept for regional railway transit in the Federal Republic of Germany will be based on two focal points:

- the functional order of the regional settlement system and
- the competitive characteristics of railways, e.g. the ability to carry a large number of passengers at high speeds over great distances.

The order of the settlement structure in the Federal Republic of Germany is based on a hierarchical system of centres with service functions on different levels:

- agglomeration centers/upper centers,
- medium centers (county centers)

- small centers (local centers)
- rural centers

The service area of an upper center overlaps with service areas of a couple of medium centers. The medium centers serve a certain number of local and rural centers as far as the respective level of administrative, social and cultural services as well as the supply of goods is concerned.

The area of influence of the agglomeration centers or upper centers cover the whole of the Federal Republic. The upper centers constitute the employment, business, shopping, cultural and social -partly also leisure activity- centers for their whole service area. They are therefore also the logical focus of the regional railway transit network and the transit services, even though in most cases the maximum distances travelled exceed the range of 50 kilometers, which in our country has been taken as the threshold for the definition of short distance passenger transit, to date. Though this 50-kilometer limit was originally first of all a statistical figure - with a certain relevance for the fare-system- it is a remarkable step in the field of public transit in Germany to come to terms with the fact, that transit distances may range up to 200-300 kilometers, depending on the mode of transport and the travel-purposes.

Today, the German Federal Railways serve regional transit with a poorly arranged variety of rail train types with indefinite profiles. Regional transit currently takes place on rail busses, local trains, ordinary district trains, express district trains, ordinary regional trains, express regional trains and even long-distance express-as well as Intercity trains, mostly over and above in competition with local-, regional- and even long distance busses. In the future there will be a clear distribution of tasks with respect to the specific advantages of the different transit systems. The railways will serve the travel demands on the regional level mainly-connecting the county-centers to each other and to their upper centers. The bus will serve first of all the local travel demand and connect the medium center level to the regional system. The railways form the strong backbones of the regional public transport infrastructure by means of a network of regional express lines on a Federal State's area at least. Stations with low passenger frequency will be closed. Local trains will be substituted by bus services.

The network of express trains will be supplemented by special express bus services along those regional axes and between those centers of an upper order respectively, where the traffic demand does not allow an economic express railway service, where no, or no longer railway tracks are available or where in future the railway service will have to be closed on economical grounds. These bus services will be integrated into the brandmarked-article concept in all their components and they will be run by the Federal Railways Bus Services.

This year, the first "model" or "test"-operation for this new concept will be started within the framework of the above-mentioned contract between the Federal Railways and the Federal State Schleswig-Holstein. The service will be characterized mainly by the following elements:

- modern motor rail coaches or newly equipped express coaches for trains,
- remarkably increased performance in terms of train-kilometer,
- express services only,
- fixed cycle operation supplemented by demand orientated trains during peak-hours,
- integrated rail/bus time tables and fares,
- improved interchange-conditions between rail, bus, taxi, private car and bike,
- improved accessibility for the pedestrian,
- corporate-identity of all passenger-orientated components,
- intensified marketing activities (tourist arrangements, off-peak fares etc.),
- optional: cafeteria services and kiosk on the trains.

First tests with the introduction of single elements of this concept have

already shown remarkable results. Partrouage shot up by 30% and more. In some cases the reaction has been less satisfactory, however. The expectations of the German Federal Railways and their advisors are not so unrealistic as to assume it will be possible for regional railway transit to become a profit-making business again. The short term aim is to offer substantially better and more adequate services on the same level of revenue to cost ratio. Based on that, the next step will be to improve also the economical conditions and results.