2.5 REQUIREMENT FOR PKP PRIVATIZATION

2.5.1 History of Polish Privatization

The legislative framework for a comprehensive privatization program of the State Owned Enterprises (or SOEs), included in the Balcerowicz radical reform, was initiated by the Law on the Privatization of State Owned Enterprises passed on July 13, 1990 and followed by other laws. The modified new Law on the Commercialization and Privatization of State Owned Enterprises was passed on April 8, 1997.

The approach to the privatization processes in Poland has been determined by the existing social, political and economic conditions expressed by the existence of strong trade unions, numerous and large SOEs (8,441) and a very limited domestic capital for privatization by direct sale. The mass privatization concept could not be regarded as a completely alternative solution in the first stage of transformation due to the necessity of time consuming complex valuations of companies, not ensuring flows of new capital and management skills required for restructuring. The mass privatization program, however prepared in 1991, became an instrument of political controversy and was finally accepted in 1993 and established in 1994 in a form of the 15 National Investment Funds (NIF).

The government philosophy to the privatization processes in Poland, implementing a variety of privatization methods (multi-track), can be characterized by two decision elements - individually formulated general privatization program by the government for particular enterprises (case by case approach) and a relatively high degree of freedom given to the privatized enterprises concerning the detailed privatization program and choice of the privatization method. The reliance placed on voluntary participation by so called "insiders" represented by managers, employees and trade unions aimed at the acceleration of privatization processes by avoiding the unexpected conflicts which would result by the centralization of these processes.

The specific feature of the Polish ownership changes is a separation of the privatization competencies into different government institutions according to the scope of economic activity in particular sectors or branches. Decision centers are assigned to regional and local authorities. The execution, coordination and control of privatization processes have been designated to the following government institutions:

- Ministry of Treasury (until October 1, 1996 Ministry of Privatization)
  - implementing the transfer of ownership from the state into private hands

- preparation of privatization policy and capital cooperation with foreign partners
- representation of the State Treasury as shareholder in the privatization process
- coordination of the cooperation with trade unions and local authorities to incorporate private companies

- State Treasury Agricultural Property Agency
  - restructuring and the privatization processes of state owned agricultural property
- Ministry of Finance
  - privatization of state owned banks and insurance companies
- Selected ministries and regional authorities in charge
  - privatization processes of selected SOEs, e.g. the Ministry of Transport and Maritime Economy will be responsible for privatization of the Polish State Railways
- Anti-Monopoly Office
  - promotion of competition in the economy
- The Securities Commission
  - regulation of the securities and capital market

2.5.2 Various Methods of Privatization

The conducted privatization programs include the following methods:

(1) Indirect privatization (capital privatization)

This type of privatization, was intended for large and medium sized, relatively prosperous SOEs. First a SOE is transformed into a joint stock company with all shares owned by the State Treasury (see Fig. 2.5.1). A new company operates according to the Commercial Code.

The sale of shares must be preceded by a detailed analysis of the legal situation, current state and prospects of development, valuation and an estimation of obligations in respect to the environment.

The State Treasury shares, up to 80% (5% of the shares are reserved for restitution claims and 15% free of charge shares for company employees), can be sold to the third parties through the Initial Public Offering (IPO), tender or by invitation to negotiations. The payments can be made in tranches, if a potential buyer of at least 30% of the company shares is a Polish citizen or the buyer is a Polish company. The first tranche must amount to at least 20% of price and the next tranches must be paid within 5 years. In this case the interest rate can not be lower than the Industrial Price Index (IPI). The free of charge 15% of the shares for company employees can not exceed the product of number of employees multiplied by eighteen times average wages in the enterprise sector for the last six months. This part of the shares can not be sold during the two

year period and for management during the three year period.
This indirect privatization method has encompassed over 1.000 enterprises.

(2) Direct privatization

The direct privatization through liquidation according to the article 39 of the Law on Commercialization and Privatization is intended for relatively prosperous small and medium sized enterprises. This method can be executed through asset sale, contribution into a company or lease to a company created by a majority of the employees (see Fig. 2). Direct privatization is designated for companies with less than 500 employees, revenues not exceeding the equivalent of ECU 6 million and own funds less than the equivalent of ECU 2 million in the previous year. The privatization process must be preceded by a detailed analysis of legal situation, current state and prospects of development, valuation and an estimation of obligations in respect to the environment.
The asset sale of the company can be realized through tender or invitation to negotiations. In this case, the agreement must take into account the buyer's commitments for investment, protection of the environment and culture and protection of employment. The social commitments with employees are an integral part of the agreement. An amount equal to 15% of company value, limited to not more than the product of number of employees multiplied by eighteen times average wages in the enterprise sector for the last six months, must be submitted by a buyer to the company's social fund. The final price is reduced by this amount.
If a company has no obligations in respect to the State Budget, the above mentioned amount is equal to twenty four times average wages.

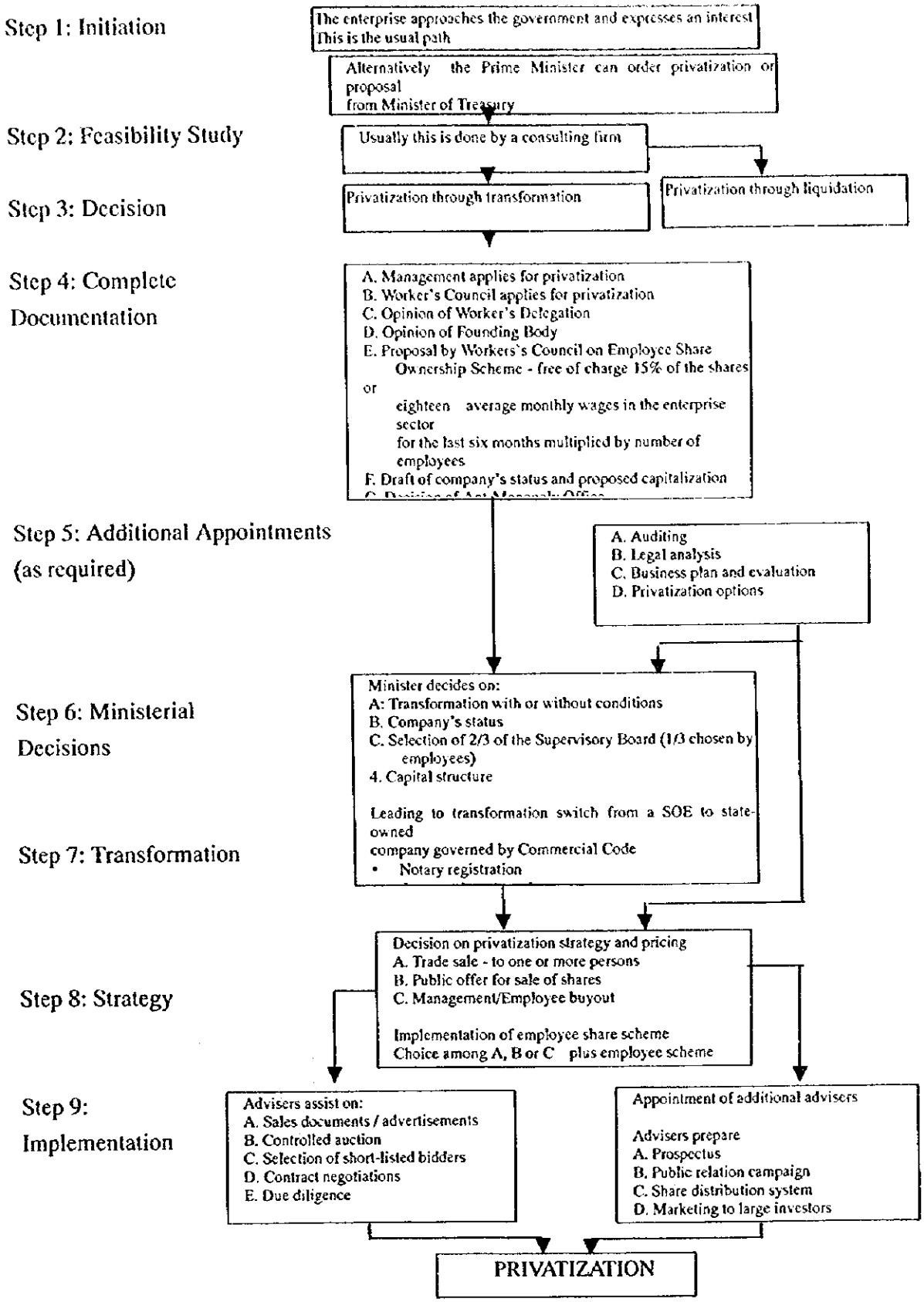


Fig. 2.5.1 Privatization Through Transformation

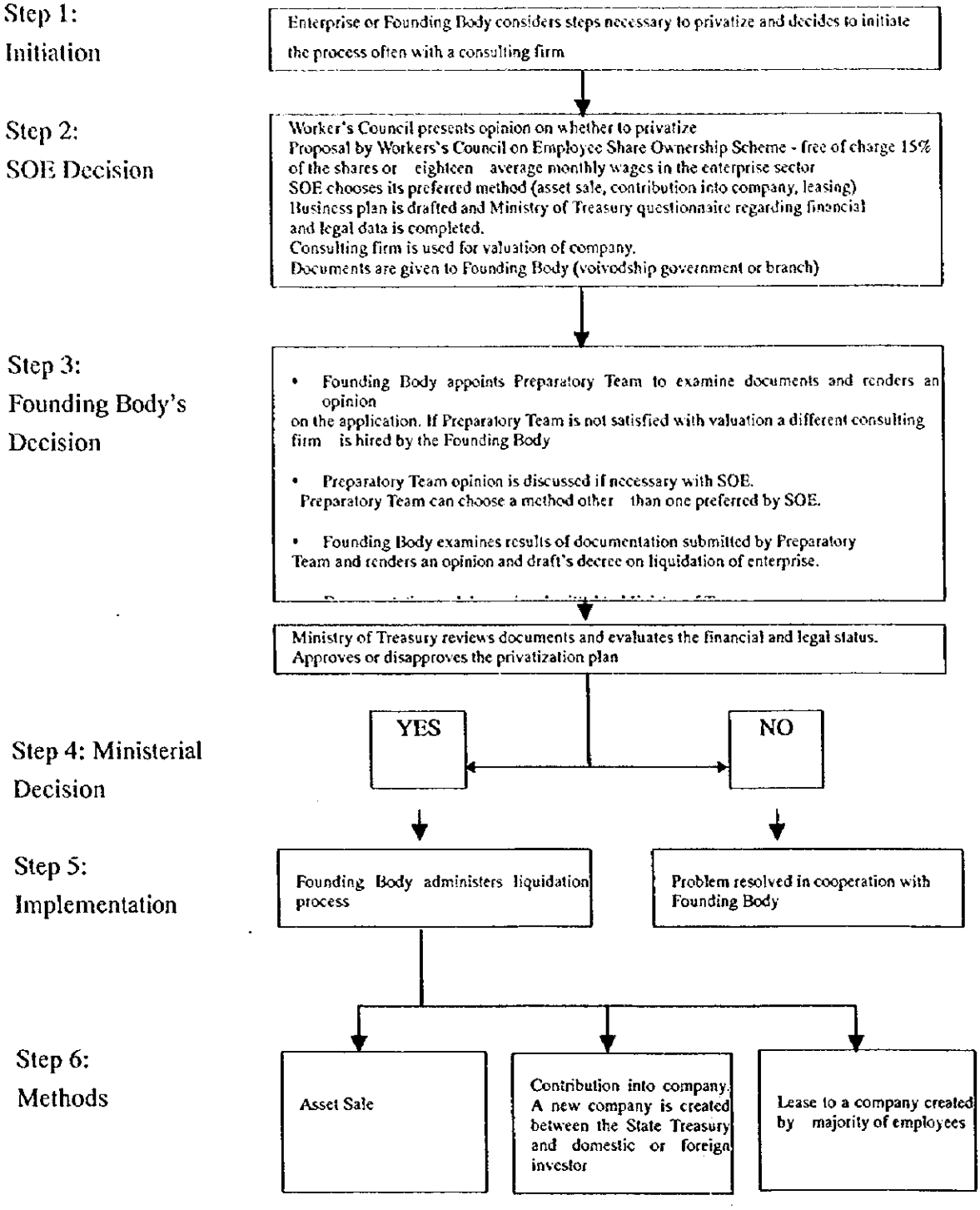


Fig. 2.5.2 Privatization Through Liquidation

The payment can be made in tranches, if the rest of price is secured after the first tranche. The first tranche must amount for at least 20% of price and the next tranches will be paid within 5 years. In this case the interest rate can not be lower than the IPI.

The contribution into company or lease of the business is realized through negotiations on the basis of public invitation. Potential shareholders should contribute in at least 25% of capital. The employees can receive free of charge up to 15% of the shares with the same restrictions as in the case of privatization by sale. The transfer can be conducted, if a new company is established by at least 50% of employees, shareholders live in Poland, equity capitalization is at least 20% of the establishment fund and at least 20% of shares are owned by persons not employed by the company.

Direct privatization through liquidation according to the Article 39 of the Law on Commercialization and Privatization, April 8, 1997 (earlier Law on Privatization, July 13 1990, Article 37), concerning enterprises in good financial condition, is one of the most popular privatization procedures in Poland and has already encompassed over 2,800 enterprises. Liquidation according to the Article 19 of the Law on State Owned Enterprises, September 25, 1981, covers the SOEs in poor financial condition. This bankruptcy procedure has been implemented for over 1,800 enterprises.

(3) Stabilization, Restructuring and Privatization Program

This program was approved in October 1994 and was aimed at companies in critical financial condition by providing appropriate management expertise, cash injections, and other tools. These enterprises, encompassing over 30 companies in 1996, will be privatized in two stages - in the first stage their shares will be bought by the Polish banks and at its discretion by the State Treasury or Agency for Industrial Development to several so called Investment Vehicles, created by the European Bank for Reconstruction and Development jointly with one participating bank. In the second stage these shares will be sold to private investors.

(4) Privatization through Restructuring

This method is for enterprises which require restructuring prior to privatization. The management group, responsible for restructuring, can buy up to 80% of shares. This option has been selected for around 20 companies.

(5) Bank Debt Agreement Procedure

This relatively new privatization technique, has been used for 164 enterprises during the period 1994 to mid-1996. SOEs are commercialized and a part of their shares is transferred to their creditors on the basis of equity swap procedures.

(6) The Mass Privatization Program (MPP)

This privatization program is applied for medium scale SOEs under National Investment Fund (NIF) Law of 1993. The MPP was created as a key element of the restructuring and acceleration of privatization processes through the 15 National Investment Funds (NIF) and was established in December 1994, encompassing 512 companies.

Each NIF, with one exception, is managed by the selected management consortium and holds 34 to 35 lead share holdings (33%) and almost 500 minority share holdings (together 27%) of the other companies in the NIF. The next part of 15% of shares will be distributed free of charge to company employees and 25% will be held by the State Treasury. Shares in the companies may be sold by the NIF directly to strategic investors, sold entirely to Polish or international companies or investors, remain as long term investment of the NIFs, placed in joint ventures or listed on the Warsaw Stock Exchange.

The distribution of 27.8 million Share Certificates, tradable in bearer form, started on November 22, 1995, priced at PLN 20 ($8). The successful sale of 95% ended after twelve months. The NIFs have been listed on the Warsaw Stock Exchange since June 1997. Their price oscillates between PLN 130-140.

2.5.3 Relationship with EU Directives

The EU railway policy, as a part of general transport policy, is composed of two essential elements:

- development of railway infrastructure
- liberalization of railway operation

The necessity of development for railway infrastructure has been expressed in the AGC and AGTC agreements on the main international railway lines - international railway network E.

The existing lines should be modernized in order to achieve a train speed up to 160 km/h. The construction of new lines should ensure the train speed up to 250 km/h. The main aim is a reduction of the road transport density towards an environment protection. In the consequence the network of high speed trains will be created. The development in high speed trains seems to be a key element for the future existence of railway transport as a mode for generating higher market shares in total transportation. The policy of liberalization postulates a substitution of the public service functions by an introduction of business oriented railway operations.

The main directions of transformation in the EU railways are presented in the following documents:

- Decree 1893/91 determines the commercial independence for railways and introduces the principle of contracts between the government and railway enterprises for the execution of public service.
- Directive 91/440 postulates the implementation of the following rules:
  a) guarantee for independence of railway management
  b) separation of infrastructure from railway operation. The accounting separation is compulsory, while institutional depends on railway management in particular countries. The government subsidy can not be transferred between infrastructure and railway operation.
  c) financial recovering towards a liquidation of debts
  d) guarantee for access to railway networks in particular countries for international railway enterprises
- Directive 95/18 determines the required conditions of concessions for railway enterprises:
  a) technical and operational requirements for railway service
  b) security of personnel, rolling stock and company organization
  c) social rights for employees and customers
- Directive 95/19 postulates:
  a) establishment of separate infrastructure unit (within or outside railway company) responsible for the allocation of infrastructure on non-discriminatory conditions
  b) introduction of infrastructure fees. The infrastructure fees will be determined by particular EU members, however the directive recommends:
     1) introduction of two level allocation procedure
     2) compulsory submission of security certificates from operators
     3) deposits or other assurance from operators

The railway infrastructure can be subsidized, if its financial loss is caused by the public services. The directive introduces a general rule that the sum of revenues and budget

subsidy should balance the infrastructure costs.

The present state and directions of development for railway transport were analyzed in the EU "White Paper. A strategy for revitalizing the Community's railways" in 1996. The document critically evaluates the railway insulation from market forces and stresses a certain government responsibility for imposed obligations without compensating fully for the costs. The proposed railway development should be determined by:

- creation of a new railway based on business orientation with independent management
- government aid intended to relieve the railways of debt and improve their finances and its linkage to restructuring program
- adoption of market forces by

a) open access for all freight and for all international passenger services, supported by the separation of infrastructure management and railway operations

b) open access for domestic passenger transport in respect to network benefits and public services

- generalization of public service contracts (PSC) between the government and railway operators
- full financial compensation of public services and exceptional social costs by the government
- integration of national railway systems
- establishment of government and EU programs for the redundant employment

The processes of PKP harmonization and adjustment to the EU standards are expressed by two legal acts:

- PKP Law of 6 July 1995
- Railway Transport Law, approved by the Parliament in July 1997

The PKP Law postulates a decisive autonomy of the company, however does not change PKP into a company operating according to the Commercial Code. The competencies of the PKP Council are similar to a supervisory board and the PKP Management to a board management in a joint stock company.

The problem of debts does not exist within PKP. It is mainly due to the former rules for PKP financing in the centrally planned economy. The government aid had a form of grants. The size of new loans, mostly from international institutions - World Bank, EBRD or EIB and guaranteed by the government, do not influence on the current finances in a significant way.

The separation of infrastructure sector is postulated by the PKP Law. This process, planned

to be terminated by the end of 1998, has been already advanced in the Lublin experiment. PKP restructuring plan assumes that the infrastructure sector will remain in the company structure. The Railway Transport Law determines the rules for infrastructure charges, following the EU directions.

The EU rule of an open access to the infrastructure is also included in the Railway Transport Law. This liberalization factor enables the open access to other operators, domestic and international, if they possess a proper concession. In the case of foreign operators the permission is issued by international (bilateral) agreements, in which Poland is one of the parties.

The principles of public service contracts are included in the PKP Law and executed by the annual agreement between PKP and the government (see section 5.8). The subsidy targeted to domestic passenger transportation covers agglomeration, regional and inter-regional transportation.

The agreement also determines government subsidy for investments on railway lines of national importance, implementing the AGC and AGTC agreements. The subsidy is not transferable (no cross subsidy), following the EU directives.

The table below presents a comparison of railway restructuring programs in some selected EU countries and Poland in accordance to the EU postulates and suggestions. The information on Polish program is based on the last version of PKP strategy documents (summer 1997).

Table 2.5.1. EU Directives and restructuring programs in selected EU members and Poland

Criteria	Germany DB	France SNCF	Great Britain BR	Sweden SJ	Greece CH	Spain RENFE	Poland PKP
Relations between the state and national railways							
privatized	X		X				X
autonomous state company		X		X	X	X	
integrated with state administration							
Ownership of railway infrastructure							
privatized	X		X *				X
state but institutionally separated				X			
state under railway management		X			X		
Infrastructure fees from private users							
total costs covered			X				
maintenance costs				X			X
symbolic fees					X		
Financing of passenger transportation							
totally from own revenues							
compensation for some services	X		X	X			X
general subsidies (not specified)	X	X				X	
Financing of freight transportation							
totally from own revenues	X		X	X		X	X
compensation for some services							
general subsidies (not specified)					X		
Sources of infrastructure investment financing							
open capital market							
mixed private and state	X	X	X	X	X	X	X
state subsidies							

* / executed in May 1996

Note: not fulfilled places denote a lack of statement in restructuring programs

Source: "PKP Restructuring. WDOKP Pilot Experiment", Lublin 1997 and documents of PKP (Strategy and Restructuring Department)

2.5.4 Requirement for the PKP Privatization

The PKP privatization should create a business oriented company with independent management operating according to market rules. The privatized PKP shall improve the enterprise performance in the following, widely accepted, scope (see also discussion in section 5.3):

- effective company management
- increase of efficiency
- development of competitive market position
- increase of quality for services
- satisfaction of customers
- access to capital and know-how
- cost rationalization
- maximization of profits

Let us consider the requirements of the PKP privatization for two possible kinds of the PKP transformation processes:

- privatization of PKP parts, called further small scale PKP privatization
- privatization of the entire PKP, called further large scale PKP privatization

The foundations for small scale PKP privatization are included in the PKP Law, 6 July 1995:

- Article 44, (Chapter 8: Amendments to the Existing Provisions. Temporary and Final Provisions):

until December 31, 1998, the Minister of Transport may (after consultation with the Council of PKP) separate from the PKP organization units or organized portions of assets in order to

a) use them for the establishment of separate state-owned enterprise or other state organization units
b) or use them as contribution to companies or transfer them to the separated entities
c) or lease them by an agreement, applying respectively provisions on privatization of state owned enterprises.

- Article 22, (Chapter 5: Organization)
  PKP may create business entities anticipated in the provisions of law

The privatization of the PKP parts, after separation from the company, can be further performed according to the Law on the Commercialization and Privatization. The privatization methods should be recommended in regard to employees` proposal, business

activity and actual market situation.

It is proposed to use two methods for small scale PKP privatization (see discussion in section 5.2.2):

- indirect (capital) method
- direct method

additionally completed in exceptional cases by

- bank debt agreement procedure

The indirect method is especially recommended as ensuring capital inflows. The direct method with its different paths can be applied only for PKP parts, which have less than 500 employees. The bank debt agreement procedure can be used in exceptional cases to cover possible PKP debtors.

The small scale PKP privatization path could be an effective instrument in the PKP restructuring process. It would create new economic units from the PKP assets, both with and without PKP shareholding. However this form of privatization has not been used for the last two years 1995 - 1997. In addition, the PKP restructuring plan limits separation and further privatization to the PKP social activities until the end of 1998.

The company argues that the small scale PKP privatization can not be conducted due to:

a) lack of acceptance from employees (trade unions) caused by the unemployment threat combined with loss of railway privileges
b) "bad experience" at the privatization of ZNTK in the early 1990´s.

The trade union acceptance could be however achieved by attaching some social commitments to privatization plans, following other non-PKP privatization cases, e.g. guarantee of no layouts for a certain time period, better motivation system etc. Similarly the loss of railway privileges can be compensated by expected increase of wages.

The privatization of the ZNTKs was conducted in the early 1990`s, at the beginning of the transformation period with a general lack of transformation experience. The negative consequences for employees as layouts and decrease of real wages have been observed. The PKP has not gained expected advantages in the form of decrease in costs due to a creation of quasi-monopolistic structure by the former ZNTK companies. Maybe it would not be a wrong response to separate and privatize (possible with PKP as shareholder) some traction and backup enterprises aiming at creation of market competition.

On the other hand there are also many positive examples of privatized PKP parts or with

PKP shareholding. The most spectacular case is a joint venture "Adtranz ZWUS Signal" in Katowice, which was established in 1991. PKP as the main shareholder (60%) transferred its assets and foreign partner brought know-how and cash inflow. Other positive examples are very profitable joint ventures like "Chem-Trans" or "Polzug" (Polish-German company for container dispatch).

The foundations for large scale PKP privatization (integrated or holding structure) are different due to the fact that the company acts according to its own PKP Law. The Commercialization and Privatization Law from April 8 1997 does not cover PKP according to:

- Article 3 pos. 7 as an SOE „acting under acts other than law on state owned enterprises

It means that the large scale PKP privatization requires a new PKP Privatization Law. Taking into account the size of PKP (over 500 employees) and the Polish Privatization Law, the indirect (capital) method can be only proposed (see discussion in section 2.5.2). The future PKP Privatization Law can be elaborated on the basis of the Commercialization and Privatization Law for indirect privatization method (see Fig. 2.5.1 presenting the privatization through transformation) combined with the existing PKP Law.

In the first stage of transformation the PKP must be corporatized into a joint stock company owned in 100% by the State Treasury and governed by the Commercial Code. Some elements of corporation procedure have been already included in the PKP structure (PKP Law). For example, the functions of the PKP Council are similar to a supervisory boards (including its composition needed to commercialization processes in Poland). Also the competencies of the PKP Management have many common features with management boards in joint stock companies.

The final goal of the large scale PKP privatization is the Initial Public Offering (IPO) and a successful listing on the Warsaw Stock Exchange (WSE). It means that the PKP should match all conditions of the WSE. The most significant conditions concern its financial results. According to the present state of WSE regulations, PKP S.A. must have registered a pre-tax combined profits for the past three financial years of at least PLN 5 million and a pre-tax profit for the last financial year (present state of the WSE rules). The future PKP S.A. must also have publicly disclosed audited annual financial reports for the last three financial years.

3. ISSUES TO BE SOLVED TOWARDS PRIVATIZATION

3.1 ROLES OF RAILWAY TRANSPORT

3.1.1 Railways Position in Transport System

(1) Commercial viability of railway business

From eras in which railways are the leading role in the land transport, today's transport policy has been changed to focusing on the competition of different transport means, assuming the development of airplane and automobile traffic. The conventional transport policy, which is based on the entry regulation with a natural monopoly of railways in the transport market as its background, have lowered its effectiveness under the current conditions that the competition of different means of traffic and the diffusion of private means of traffic have been progressed, and the fundamentals of the policy have became a policy to attach greater importance to optimization of welfare values on consumer and national economy through the deregulation to promote the competition between the traffic means and the transport enterprises .

It has been anticipated that the railway business also in Poland will face at competition among traffic means in the future, and the traffic system reorganization will advance on the basis of the commercial profitability by the principle of the survival of the fittest under the common rules.

On the other hand, however, because of external effects, etc. in the traffic market, considerable cases, in which market mechanism is not reliable, are expected, for that necessary public regulations are required in view of the point of view of social convenience and utility preservation.

1) Inter regional passenger transport

In general since the traffic demand between cities has a high elasticity against market related factors, for example, income level, quality and time of service, etc., a tight competition has been expected between transport means .

a) Focusing at characteristics of the railway system as a decreasing cost industry, in Poland, like Warszawa-Katowice and Warszawa-Gdansk, there are corridors to connect areas of high density distant from a few thousand kilometers. It is considered that such corridors create a prominent market to railway systems.

b) With regards to the predominant property of each means of traffic, its transport distance becomes the most important factor. It is said that the railway can compete predominantly against the aviation in a range of less than 300 km of the transport distance. The above-mentioned corridors have satisfied this criteria.

c) Concerning the competition with long-distance bus, the availability of expressways becomes a crucial element. If the long distance bus services can get high-speed advantage through the servicing of expressways, of which network is provided in short period in comparison to the railway network, there is a possibility that they becomes a strong competitor not to be ignored. Therefore, it is important to improve transport characteristics by means of the modernization of track, introduction of high-speed rolling stock, etc.

2) Intra regional passenger transport

The PKP has covered the transport network at present also at the intra regional level, and it is considered that it plays a significant role competing with the other means of traffic also after privatization. However, since the market scale extremely differs depending on areas and places, it is important to examine an adaptability of the railway system from the point of view of the demand or need. The urban traffic market has a large-scale traffic demand represented by the commutation, and it has been estimated that the railway can display a role by providing a large transport capacity. The railway can be said as the most suitable transport means to the public convenience in view of its mass transport capacity and being harmonious to the environment, and it is considered that in the big city area like Warszawa, the establishment of the municipal public transport system, incorporating the railway as a core system, is desirable. However, it is expected that the railway profitability is hardly maintained in the urban public transport similarly to the Western countries, it will be necessary that the urban transport is maintained by public assistance with the public interest aiming at superiority of railway as a public transport system .

On the other hand, as for local transport sectors of PKP, they do not meet the conditions for the railway business in view of the profitability because their demand characteristics are of short-distance type and of low-density transport,. From the economic viewpoint in traffic, it has to be said as very difficult to maintain the public transport network including the railway in the local traffic market. As this result, the demand shift has been continuing from the public transport to private transport means. However, it is also true that there are railway captives in part without the transport

means except the railway, it is necessary that the government clarifies the responsibility of role sharing between the railway business and the government as to keeping local railway networks with low profitable lines and should take initiative on the alternative transport provision, etc. when the railway has to be abolished.

3) Freight transport

As clarified by the present transport results, the main transport items of PKP are of bulk transport for coal, ores, oil, etc. It is expected that these key items will reinforce the importance of railway freight in the Polish industries in the future. Therefore, it is assumed that the bulk freight stands at the comparative predominance also in the railway industry. However, accompanied by the economic growth, main cargo item will shift from raw materials to the industrial product, it is considered that railway freight should maintain its position by developing the combined transport services in which railway freight has a close connection with road transport

(2) Perspective of car traffic

It is expected that the development trend of road traffic affects considerably to activities of the railway as a significant competitor against the railway transport. First, the car ownership has grown rapidly at present, and considering an increase in economic growth and average income in the future, it is supposed that much more cars will be owned in households in the future. As other factors related to the utilization of automobiles, changes in utilization trend and the progress in road provision are important. Concerning changes in utilization trend, in the case of passenger transport it is supposed that passenger cars attract more public interest as means of individual transport, accompanied with the rise in individual income and time value. Besides, while the urban structure becomes dispersion type more, specific land-use being adequate to car usage, will be developed, acting as an element to enhance car availability . As for the freight transport it is supposed that the unit of transport becomes smaller and higher quality is oriented for freight transport with transport items' being diversification and high value, accompanied with the economic growth . Relatively the railway transport will decline while the freight transport by truck obtains chances .

On the other hand, with regard to the progress to the road provision, it is pointed out that situation is not necessarily optimistic . Regarding the present situation of road network provision, domestic trunk line network is of approximately 367,000 kilometers (national roads to streets), the inter-city road has been provided by the Public Road

Bureau (GDDP), however, after 1986 the finance of road maintenance has been reduced, and as the results servicing level of roads has been considerably lowered. Among trunk roads, what is found at the satisfactory servicing level has remained at level of some 20% of the whole, taking account of the increase in road traffic demand, and there is no sufficient condition to keep higher car usefulness . Meanwhile,with regard to the provision of expressway network adequate to the high-speed traffic, the construction plan extending over 2,600 km has been publicly noticed, and as to the implementation there has been a plan by toll roads on the basis of the Expressway Law. (In 1994 the Road Agency ABEA as a servicing entity was founded). However, according to the figures publicly announced, the plan assumes to finish the construction of the road network within 20 years with total amount cost reaching to 100 billion US $, and it is considered that even apart from cost issue, the plan target, which is to provide road network in use at a base of 160 km of annual average, is remarkably difficult to be realized, when considering the necessary term for design and assessment process carried out before.

In particular since the toll road provision has depended on employment of private sector as the BOT, etc. the business profitability becomes a crucial factor, and it is remained uncertain whether the construction plan will develop or not according to the initial target plan . Assuming the above-mentioned, concerning the car transport in the future it is supposed that diffusion of automobiles themselves is progressed and the social and economic conditions act as a plus factor for the car use, however the perspective is not necessarily clear and lucid in the future because it has been unknown whether the road provisioning program favorably progresses or not . It is considered that at least since the entire expressway network will be hardly developed in these 10 years more or less, the car transport could not give a threat against the railway dealing with the medium and long distance traffic. (For the freight it is considered that the shift to automobile continues.)

(3) Role of railway from viewpoints of social economics

Rapid increase in car ownership has been progressed accompanied with the economic growth as seen clear in the present car registration state in Poland. It is foreseen that the present number of 7,000,000 units of cars more or less will reach to the level exceeding 12,000,000 units in the 21st century . If this increase continues in metropolitan areas like Warszawa, etc. the road congestion will be deteriorated more, and the lack of traffic capacity will become more serious. Apparently this trend gives unfavorable effect to the environment and the living, and it is clear that the relatively moderate road improvement scale, that has progressed in the present urban area, does not meet a rapid

increase of road traffic demand, and it is considered that the effective utilization of the mass public transport,including the railway network, should be taken as the standard of urban transport policy rather than the increase of road capacity, as suggested from the Western experience . In the urban transport policy in the EC, it has been suggested that the punctuality, frequency, safety and low pricing of the public transport, are enhanced from viewpoints of the urban environment and the attraction of the public transport should be enhanced. The investment cost for this purpose is not little, but will be justified from the viewpoint that effectiveness of railway and the impact to the environment being little. The railway network in urban area acts not only a simple industrial infrastructure, but also a close transport infrastructure for many urban activities, such as social activity, cultural activity, tourism, and others, thus it is considered to be justifiable that the state, local government and/or beneficiary enterprises support its provision.

3.1.2 Traffic Demand Outlook

(1) Traffic Demand Forecast

The detailed traffic demand forecast is shown in the Appendix and the main point is shown here:

The demand forecast for railway passenger was conducted by using "four-step method."

First Step : Trip generation/attraction forecast

Second Step : Trip distribution forecast

Third Step : Modal choice

Fourth Step : Traffic assignment

The potential number of the railway passengers was calculated by using the average number of trip for railway passenger over past 5 years of 0.0385 trip/day/person as a control total value. The number of the passengers who will transfer from the railway to automobile was assumed to be 130 million trips. Trip generation/attraction model were forecasted by using the multi-regression model assuming the population, the working population and GDP of each voivodship (prefecture) as independent valuables. The trip distribution model followed the present pattern method by OD table among main stations based on the PKP statistics for ticket sales. In the modal choice model, the improvement of the speed and the effects on the rise of the fare were investigated by making the multinominal logit model from SP (stated preference) survey. The traffic assignment was distributed on the link based on the PKP railway network by all-or-nothing assignment method.

On the other hand, the railway freight demand forecast employed "growth factor method" by the steps shown below:

First Step : Forecast on production volume by commodity

Second Step : Trip distribution forecast by commodity

Third Step : Traffic assignment by commodity

The production volume by main 17 commodities were used as a control total value. The production volume was revised by the GDP future forecast and several statistics of the newest GUS (Central Statistical Office) based on the numerical value which was forecast in "PKP Restructuring Project" in 1993 and in 1995 through the World Bank. The trip distribution model was based on the OD table among the main stations by the statistics on the PKP rail freight transport. The traffic assignment was distributed by main commodities on the link based on the PKP railway network through the all-or-nothing assignment method.

The results for the demand forecast on the railway passenger and the railway freight are shown in table 3.1.1-2. The number of passengers in 2005 will decrease by 8% over that in 1995 and passenger-kms in 2005 will increase of about 7% over that in1995. Meanwhile, though there will be many fluctuations of freight ton and ton-kms by each commodity, the total freight ton and ton-kms in 2005 will stay on the same level as those in 1995, respectively.

Table 3.1.1 Summary of projected railway passenger transport

	1995		2005	
	No. of Passengers in thousand	Passenger-kms in million	No. of Passengers in thousand	Passenger-kms in million
International Transport	5,049	857	7,500	1,273
Interregional Transport	64,266	15,617	75,500	18,347
Regional Transport *	395,744	10,149	344,000	8,822
Agglomeration Transport	262,969	6,425	263,000	6,426
Total	465,059	26,622	427,000	28,442

Note: Regional transport* includes agglomeration transport.

Table 3.1.2 Summary of projected railway freight transport

	1995		2005	
	Freight Tons in thousand	Ton-kms in million	Freight Tons in thousand	Ton-kms in million
Hard Coal	107,600	32,722	77,185	23,473
Other Commodity	116,745	36,372	146,526	45,650
Total	224,345	69,094	223,711	69,123

(2) Modal Choice

The curve on the railway utilization rate in 1995 and 2005 was made by using Railway OD forecasted in this survey and the Road OD Table forecasted in PHARE Programme of EC (Dec. 1996). The result is shown in Fig. 3.1.1-2.

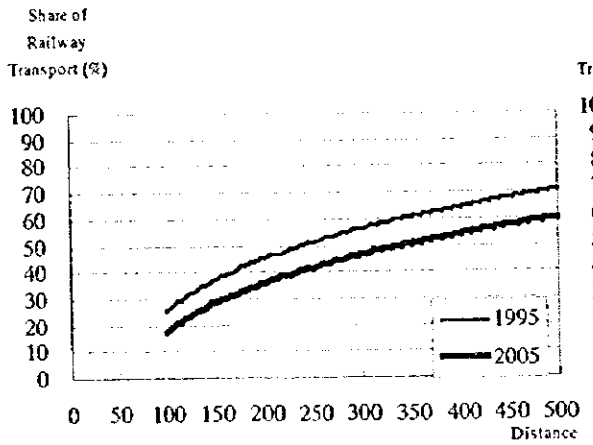


Fig 3.1.1 Railway Utilization Rate of Passenger Transport

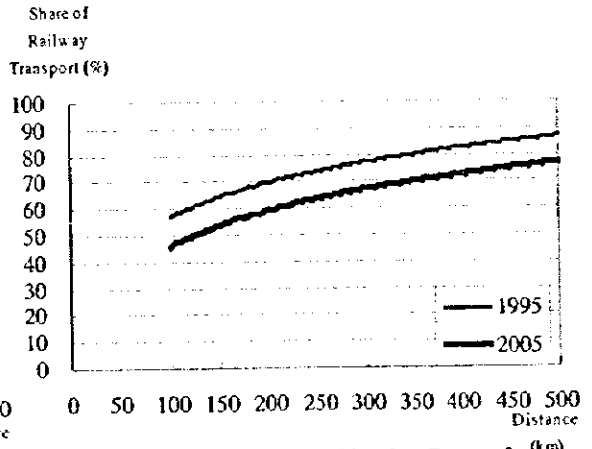


Fig 3.1.2 Railway Utilization Rate of Freight Transport

The share held by the railway system for passenger transport in 1995 is exceeding 50 % with trip length of more than 300 km. Likewise, the share held by the railway system for freight transport is 70 % with trip length of more than 200 km. The long distance transport by railway system is advantageous for passenger transport and freight transport. Although the number of registered cars is increasing year by year, the road development has not been progressed. The automobiles are used by commuting for short and medium distance.

In the passenger transport in 2005, the share held by the railway system is more than 40 % with trip length of 300 km. For the long distance transport, the share held by passenger transport will lose abuot 10 % against 1995. The share held by the railway system for

freight transport is about 10 % decrease. The share held by the railway system for freight transport is 60 % with trip length of 200 km. However, the number of the railway passenger and the number of freight ton will not be more decreased than those of the present situation. Because, the demand for passenger and freight of all transportation systems is increased as the future business activity and the GDP are developed.

From a viewpoint of the passenger transport leaving at Warszawa and the freight transport leaving at Katowice, the share of the railway system transported among main cities is shown in table 3.1.3-4.

Table 3.1.3 Share of railway passenger transport among main cities

Cities	Distance in km	Share of Railway in 1995	Share of Railway in 2005
Warszawa – Gdansk	326	46 %	34 %
Warszawa – Krakow	302	70 %	58 %
Warszawa – Katowice	300	54 %	40 %
Warszawa – Poznan	304	59 %	47 %
Warszawa – Szczecin	515	71 %	60 %
Warszawa – Wroclaw	378	70 %	59 %

Table 3.1.4 Share of railway freight transport among main cities

Cities	Distance in km	Share of Railway in 1995	Share of Railway in 2005
Katowice – Warszawa	300	97 %	93 %
Katowice – Gdansk	531	86 %	71 %
Katowice – Szczecin	532	91 %	82 %
Katowice – Poznan	318	89 %	77 %

(3) Investigation of Main Cause for Demand Fluctuation

As the main cause for the demand fluctuation of the railway system, the population, GDP, fare (tariff), traveling time (transporting time), the number of registered cars, the road development (motorway extension) are considered.

The population is expected the low growth at an annual rate of 0.23 % until year 2005 by the GUS. Generally, the number of the population and the traffic demand are the proportional relation. In Poland, the population is not expected to increase and it is thought that it does not contribute to the fluctuation of the traffic demand.

Regarding the influence of GDP, the lowering of the demand of all transport systems including the railway service before and after 1990 is caused by the decrease of the purchasing power by the stagnation of the economic activities accompanied by the rise

of the inflation. However, in the economy of Poland, the growth of GDP is expected to increase more than 5 % until 2000. The traffic demand per person is expected to increase. This survey forecasts on the premise that the growth per person will be recovered to the level of the average trip per person between 1990-1995. In the freight transport, it is thought the production volume is in creasing and the commodity flow is increasing in proportion with growth of GDP.

The recent rise in the railway fare has deteriorated the consumers' purchasing power. It is known that it is greatly related with the decrease of the railway passenger. It is understood from the SP survey that the passengers are sensitive to the railway fare. In summing up, if the fare will rise at 10 %, the number of the railway passengers will decrease at 10 %.

The freight tariff in Poland is politically decided upon the coal freight which amounts to 50 % of the railway freight transport and the relationship between the tariff and the freight demand is not clear. The detailed information will be referred in §3.3.

It is very important to shorten the travelling time for the railway passenger, specially for the passenger on business. Followed by the CMK (Central Trunk Line), E-20 and E-30 are being developed. As the commercial speed is improved, the number of the passenger is recovered. It was analyzed in the SP survey on the railway service that the number of the passenger will increase as the commercial speed is developed.
The shortening of the running time gives little effect on the freight transport. The reason is that in the freight transport, it takes much more time to handle the cargo in the railway yard. If the total transporting time is decreased, it will give the effect on the demand of the freight transport.

It is well known that the car ownership in Poland has rapidly increased these days. The number of registered cars shows the growth rate of more than 5 % per year since 1991. Likewise, the car traffic volume shows the increase rate of 7 % per year from 1991 to 1995. Although in the city such as Warszawa having the number of car spread rate of 300 cars per 1,000 population, the number of registered cars is increasing, the car traffic volume in the city hits the ceiling. Therefore, it seems that there has not been changed greatly in the intracity car transport. On the other hand, it seems that in the intercity traffic, as mentioned in (2), the share of the railway passenger will be decreased about 15 % and the share of the freight will be decreased about 10 % in 2005.

The national motorway construction plan has been proposed by AREA and motorway A1, A2 and A4 are specially important. Although the development of the ordinary road network is promoted year by year, the motorway construction has been delayed. This is mainly because of the fund for the construction. The construction method of BOT (Built-Operate-Transfer) is also applied, but it is still at the state of the shortage of the fund. It is speculated that it will be a competitor to the railway transport upon completion. It will be difficult to complete all facilities of the highways by 2005. Therefore, it seems it does not greatly influence the railway service except the particular intercity traffic.

3.1.3 Direction of Transport Market Policy

(1) Direction of market liberalization

According to the Polish transport policy, it has been suggested that as a target the policy aims at reorganizing the transport business, which is exposed to strict competition in intra-regional, inter- regional and international level, being adjusted to commercial rules at present and from now.

For this reason, it becomes important to arrange the fair market conditions for transport sector, coordinating effective linkage of the social conditions with transport market by accompanied with the development of market economy. That is to say, it is desired to make adjustment of competitive conditions between transport sectors, conducting the prevention from unfair business customs and keeping the level as to the safety, techniques and comfortableness, as well . As the basic principle related to the integration of competitive conditions among transport means proposed by the EC, it has been pointed out that each transport system should bear its cost accompanied with using the infrastructure as the absolute conditions in order to make the equilibrium market. In case it is limited to the land transport, a considerable difference has been observed in the infrastructure cost between the railway transport and the road transport in Poland, and the equilibrium of infrastructure cost borne between both parties will be required.

As a clue to consider the measures for this purpose, the following approach is assumed:

① The infrastructure cost has been constituted by two: fixed cost,including the sunk cost, and variable charge, which is accompanied with the utilization of vehicles. According to the basic concept of the EC, from a long-term viewpoint it shall be reasonable that all of this fixed cost + variable cost is borne by the utilizer. On the one hand, the marginal cost principle to bear only variable cost by the utilizer from

the viewpoint in terms of effective utilization of the traffic system is made important, and in this case it does not agree with the above-mentioned full cost principle. To cover the full infrastructure cost only by charging the marginal cost, the subsidy from the general source by the fee collection separately charged is made necessary and indispensable. However, such a cost transfer between economic sectors is not preferable as a whole, and finally the full cost principle shall be aimed, without some exceptions like reason on regional policy, etc. After all since the size of infrastructure utilization cost is not only crucial factor to utilize there, but also to determine the scale of railway traffic market, the more adequate direction shall be studied among financial and social conditions where Poland is found.

② For the equilibrium of costs, there is two typical approach, the first way is that the expenses at the railway side, which is supposed as much borne, are reduced, or the second way is that the extra cost at the road side is collected in form of duties or surcharges . For the Polish transport policy the increase in charge to the road side may be cause of inflation, etc., and it may be desirable to alleviate the infrastructure cost at the railway side. For this reason it has been pointed out that the infra cost is reduced through abolishing local routes with low demand density or the access right to PKP line is given to operators other than PKP.

It is pointed out as a more important side that raising of infrastructure cost shall not be considered only by making agree the competitive conditions of transport systems, but the investment for the preservation and expansion of the infrastructure is continued in considering the development with equilibrium of the traffic network in the future. Seeing from this point the actual situation is lacking of the investment for the preservation and repair both in terms of the railway and road, and in case of forecasting the traffic market and the domestic economic development in the future, the facilities investment of more than the present level becomes indispensable conditions. Therefore it shall be recognize that the cost charge of minimum limit assuming the expansion of transport infrastructure both for the railway and road is necessary, and among them it is desirable to make efforts for the realization of fair competitive conditions.

(2) Open access of railway infrastructure

In the EC the structural reform plan in the transport sectors, aiming at the EC's market integration in the future, has been already examined, and as concrete actions several directives and proclamations to member countries have been issued. Poland has declared as one of policy targets the matching with the EU standard in the transport

policy aiming at the future affiliation with the EU. Among directives up to now, as a directive to determine the proper way of the railway network in the future Europe, there is an EC's directive (91/440/EEC) (adopted in 1991 and proposed for revision in 1995).

The said directive is composed of the following:

①Granting the administrative independence right to the railway management

②Separation the operation sector from the infrastructure on accounting (vertical separation)

③Finance stabilization of railway business

④Guaranteeing the open access to the railway network of each country

the above is a suggestion with large influence on the way of being the railway in the transport market.

Regarding ② and ④, the liberalization (open access to the infrastructure) of railway transport in the EC's member countries by the directive No. 10 is proposed, and the type of access to the infrastructure as indicated below is being supposed to the railway business including the international railway enterprise group.

Table 3.1.5 Type of open access in the EC's directive

Division	Type of transport	Area where the transport is performed		
		Interested country of enterprise entity	In the group country	In the other member country
Domestic business entity	Passenger and freight transport	Access permitted	-	-
International transport group	International passenger transport	Access and passage permitted	Access and passage permitted	Only passage permitted
Enterprise in compliance with Article 2 1*	International composite freight transport	Access and passage permitted	Access and passage permitted	Access and passage permitted
	Cabotage transport *3	-	-	Access permitted
	International passenger transport *4	Passengers are possible to get on and off at all stations.		

Note 1* Business entity except enterprises performing only the area transport service within member countries

2* Railway enterprises included in the international group and international composite transport require agreements on management, techniques and finances with the railway infrastructure controller to avoid issues of traffic management and safety on the international transport service.

3* Freight transport entrusted to a third interested business entity, under examination additionally proposed from the EC's Association in 1996.

4* Is now under discussion based on the additional proposition submitted by EC committee in 1996

It is understood that the above-mentioned rules require the perfect liberalization saying of the internal and external and indiscriminate handling as to the infrastructure access of railway business entity. Against this the actual movement is negative as to the access to the infrastructure of the proper country by the international railway enterprise group

for each country, and it has been found in the trend that the establishment of open access right is not necessarily changed in a favorable way.

On the one hand, as a movement of servicing the Polish domestic laws, there is the establishment of the Railway Business Law, intending the legalization bearing in mind the vertical separation of railway, establishment of license system on railway business and realization of open access to the infrastructure on the basis of the EC's directive. Concerning the article of open access in it, what is intended on the liberalization equal or of more than it to the EC's member country is noted.

Table 3.1.6 Comparison between Poland and the EC as to the vertical separation

Division	Poland		EC	
	Applicable law	Contents	Applicable law	Contents
Open access	Railway Transport Law, Art. 10	An access is permitted with an assumption to the international agreement with Poland also to the overseas transport business entity. (Basically internal and external and indiscriminate)	Directive 91/440, Art. 10	For example, to the international transport business group that does not make Poland as the interested country inside Poland only the passage is permitted. (It is not perfect access free.)
Railway business license	Railway Transport Law, Art. 24	The general license rules against both the railway transport business and the railway infrastructure business are enacted.	Directive 95/18, Art. 4	The license rules against railway transport business entities of member countries are enacted. However, the access right to the infrastructure shall not be permitted.

That is to say, if there is an agreement with the railway infrastructure business entity, it has been provided that any railway transport business including the overseas business entity (the signing of international agreement is required) can be entered, it is supposed that the liberalization of railway transport in the territory of Poland rapidly advances, and it is guessed that the character of railway business in the future is sharply changed. In this respect, the permit of infrastructure business entity, being different from the EC's directive, is established by the general license rules including the railway transport, and it is mentioned that the infrastructure management is not separately handled. As this result, in addition to entry liberalization of the international operators, there is an issue of infrastructure license obtaining by overseas business entity as a possibility, and it could become a new issue at the stage which the infrastructure separation is carried out in the future .

(3) Pan-European international rapid transport network

Pan-European international rapid transport network is a concept that foresees the EC's

integration, and supports the increase of high speed transport demand in EC's countries after integration, aiming at connecting each country in Europe by the rapid railway network . The EC's committee announced the study report on the construction of European rapid railway network in 1990, and proposed was the rapid transport railway network composed of 9,000 km of new lines, 15,000 km of improvement for conventional lines and 1,200 km of connection lines by 2010 as the master plan in it. As a matter of fact, since the EC does not plan the international railway, but the practical planing and construction are carried out by member countries, the adjustment of routes between countries and/or the technical consistency become important issue. For this reason, indicated was the guideline of (interoperability) to make the mutual service of rapid railway system possible in the EC's Directive No. 96/48. According to this the level that shall provide the vehicle equipment and infrastructure of Pan-Europe rapid transport railway network and the function for the mutual service the rapid transport railway network connecting plural countries (operability), and the requisite, etc. to function these effectively have been prescribed, and the interested countries shall be required to make efforts toward the servicing. Poland, being located in the center of traffic corridor connecting the West Europe to the East Europe, has some international important routes in the territory as a concept route, and there is a possibility to become issues of domestic railway network servicing in the future in shape of the international pledge toward the formation of international rapid railway network. In particular, it is supposed that the installation of interoperability being necessary to form high speed railway network comes to be important, and as to routes corresponding to international important routes, the technical conditions in accordance with the international standards will be needed .

3.1.4 Consideration of Environment

(1) Preliminary Environmental Survey

1) The purpose of survey

According to PES (Preliminary Environmental Survey), the purpose of the survey is to size the essence of the negative impact to the environment, by the privatization of PKP and, in the same time, to make some preparation to decide a necessary clause by IEE (Initial Environment Examination) and EIA (Environmental Impact Assessments).

Therefore, in this section, necessary items are provided for the environmental screening and scoping of the options taken in PKP privatization plan, taking account

of the JICA environmental guideline which is to foresee environmental problems and provide the environmental protection scheme.

2) Environmental legislations and EIA screening system

In nowadays Poland, the law concern on the EIA was revised in 1995 and the environmental legislation came up as following:

- 1973 Statute on the Protection of Agricultural and Forest Lands (amended in 1982)
- 1974 Statute on Water(replaced in 1990)
- 1980 Statute on Environmental Protection and Management (amended in 1989, 1990, 1993 and 1994)
- 1990 Decree on Environment Impact Assessments (replaced in 1995)
- 1991 Statute on State Inspectorate for Environmental Protection
- 1991 Statute on Forests
- 1991 Statute on Nature Conservation
- 1994 Statute on Construction
- 1994 Statute on Mining and Geological Concessions
- 1994 Statute on Physical Development
- 1995 Decree on Environmental Impact Assessments

Present Polish EIA is mainly related to the produce for a matter of the land utilization, and is called OOS for environmental appraisal, when in America it is EIS (Environmental Impact Statement) and in Western Europe fall down under EIA (Environmental Impact Assessments).

This report is a preparation of the first step to decide and investigate developed regions. The main purposes of that are shown bellow:

- to specify the threat imposed to the nature by the applying development
- to define the way of avoiding this danger
- to presuppose changes which comes with the effects of the promoting development
- to describe the result implemented in the applying development

In case of OOS preparations, mutual related matrix, network analysis, agreements, lists, revisions, and standard techniques are used. As well, Polish OOS application methods are different from other countries. In case, environment or somebody is hurt, the investment matter is determined to be harmful, and the OOS is obliged to apply. In Poland, OOS assessment is applying toward the investment matter of the country,

countryside and area's level. Than, checking the standard conditions, Polish OOS is accepted by law and comes under control of the Ministry of Environmental Protection, Natural Resources and Forestry and the Chief Sanitary Inspector.

3) The enforcement of screening and scoping

Present situation of the Polish National Railway is understood from the collected materials and the field survey's data. (The environmental standard, nature protection areas, environment guideline, etc.) Basing on that, there is a possibility to size, among the others, the essence of the components of the social economy, natural environment, life environment and also to adopt JICA screening format, as well as, to rate the level (yes/no/unknown) for the negative impact to the environment that can happen because of the privatization.

As a result of the one mentioned above, the needs for applying IEE or EIA are decided. Consequently, in case there is a need to apply IEE or EIA, regarding to the scoping, the impact to each environment would be classify in 4 ranks. In the same time, according to applying of IEE or EIA, the important fields and items would be decided. From those results, grade of the environment impact, depending on the process of privatization, is judged and mentioned in this report.

a) Screening procedures

Screening is defined as a decision linked to the project requiring environment impact survey. Another words, screening is the first made decision taken under consideration to environmental problem and should be treated as the first an important step to consider. The Preliminary Environmental Survey based on screening set up following ideas:

- Ensure that the planned development does not adversely impact the survival and life of the inhabitants concerned and that social life receives full advantages while sustainable development and expansion for the local area are secured.
- Ensure that the planned development does not cause significant loss of the existing state of the natural environment and that a harmonious environment is maintained while rare environmental and natural resources are preserved.

Screening review connected to the process of privatization mentioned in this case, is putting in practice according to the concretely items and is put in order in JICA format in the Table 3.1.7, including the column with the effects of the environmental components' research.

According to that, there is mentioned as well as the stand of the influence to the

environment as, based on the general assessments, the need of implementation IEE or EIA. It is concluded with a short sentence.

Table 3.1.7 Result of screening

	Item	Content	Evaluation			Remark
Social environment items						
1	Resettlement of inhabitants	Resettlement accompanying site possession (transfer of right of residence and land ownership right)	Yes	No	Unknown	
2	Economic activities	Loss of land or other production opportunities; changes in economic structure	Yes	No	Unknown	Rationalization of management.
3	Traffic / public facilities	Impact on traffic congestion, accidents, and other transportation conditions and impact on schools, hospitals, etc.	Yes	No	Unknown	
4	Community division	Division in local society due to traffic obstructions	Yes	No	Unknown	
5	Cultural property	Loss of shrines and temples, buried cultural property, etc, and their depreciation in value	Yes	No	Unknown	
6	Water-use right and right of common	Obstruction of fishing right, water-use right, mountain and forest right of common, etc.	Yes	No	Unknown	
7	Public health conditions	Deterioration of health environment due to production of wastes and harmful insects	Yes	No	Unknown	
8	Wastes	Production of construction wastes, waste dumps, solid wastes, etc.	Yes	No	Unknown	Facilities improvement
9	Hazards	Increased danger of landslides, cave-ins, accidents, etc.	Yes	No	Unknown	
Natural environment						
10	Topography and soil condition	Alteration of valuable topography and soil conditions by excavating or raising ground level	Yes	No	Unknown	Excavation
11	Soil erosion	Topsoil corrosion due to rains following land reclamation or forest clearcutting	Yes	No	Unknown	
12	Ground water	Pollution due to water shortage or exuded water caused by excessive pumping	Yes	No	Unknown	
13	Hydrological regime	Changes in river beds and flow volume due to land reclamation or in flow of drainage	Yes	No	Unknown	
14	Coastal zones	Changes in coastal fauna and flora and coastal corrosion due to changing ocean conditions	Yes	No	Unknown	
15	Fauna and flora	Extinction of species and breeding obstructions due to changing habitat conditions.	Yes	No	Unknown	
16	Meteorology	Changes in temperature and wind conditions due to large-scale reclamation and buildings.	Yes	No	Unknown	
17	Landscape	Topographic changes due to land reclamation and obstruction of harmony due to presence of structures.	Yes	No	Unknown	Facilities improvement and established
Pollution						
18	Air pollution	Pollution due to harmful gases, exhaust from vehicles and plants, etc.	Yes	No	Unknown	
19	Water pollution	Pollution due to inflow of sand, plant drainage, etc.	Yes	No	Unknown	Dirty water from vehicle lavatory and drainage of construction site
20	Soil contamination	Contamination due to outflow and dispersion of drainage, harmful substances, etc.	Yes	No	Unknown	
21	Noise and vibration	Noise and vibration produced from operation of vehicles, train yards, etc.	Yes	No	Unknown	Increase in train frequency and speed up.
22	Land subsidence	Subsidence of land surface accompanying changes in topography or a drop in groundwater level.	Yes	No	Unknown	
23	Offensive odor	Production of exhaust gas and offensive odors.	Yes	No	Unknown	
Overall evaluation		IEE or EIA is required.	Judging from a examination of project plan.			

b) Scoping procedure

Scoping is defined as the procedure to find principal factor of environmental impact and formulate the essential survey items according to the environmental impact of started project. Therefore, it makes clear the important fields and points of the environmental impact. To define the influence which can be caused to the environment by an invitation of the project, is the one of the main aims of the scoping.

Hence, based on the confirmation results of scoping, in case IEE or EIA is needed for the environmental phenomenon which ought to be research, following the JICA environmental prevention guideline and applying the checking-list-way, the grade for the state of impact for every environmental item is determined.

During scoping, in using the checking-list, following procedures and condition were completed:

① Research condition

- Objecting period

  The research period targets at the time before and after of the project.
- Consideration of spatial extent

  Spatial extent is understood as the area not limited for only railway, stations or switchyards, but also as the zone influenced directly and indirectly by the vibration or noise caused by train operation and drain discharge.
- Object of the environmental impact

  Object of the environmental impact is generally recognized as a negative influence attend to the present status of the environment.

② Interpretation of the important fields and items

Seeking out an optimal ways, A (recognition of the important impacts), B (recognition of somewhat impacts), C (unclear impacts. Though, there is a need for testing, which can come out with some new effects.) and D (there is no recognition for any impacts, so it is not taking under consideration as a IEE or EIA's object) are divided into four levels, which is very helpful to decide the most important fields of IEE or EIA.

In this report, the scoping checking-list is as presented in Table 3.1.8. Besides, if the result of testing on any environmental objects is grade more then C score, there is a need to test it again.

Table 3.1.8 Result of scoping

	Item	Evaluation	Basis of evaluation
Social environment items			
1	Resettlement of inhabitants	D	None
2	Economic activities	B	Influence for residents due to the loss in transportation service accompanied with abolition of non-profit lines.
3	Traffic/public facilities	D	None
4	Community division	D	None
5	Cultural property	D	None
8	Water-use right and right of common	D	None
7	Public health conditions	D	None
8	Wastes	C	In case of large scaled reform, industrial waste.
9	Hazards	D	None
Natural environment			
10	Topography and soil condition	C	In case that a large scale excavation is done, it needs an examination.
11	Soil erosion	D	None
12	Ground water	D	None
13	Hydrological regime	D	None
14	Coastal zones	D	None
15	Fauna and flora	D	None
16	Meteorology	D	None
17	Landscape	C	Examination is need when reform of facilities or establishment takes place.
Pollution			
18	Air pollution	D	None
19	Water pollution	C	Need examination for drainage of construction and dirty water from a train lavatory.
20	Soil contamination	D	None
21	Noise and vibration	B	It is thought to be a noise and vibration accompanied with speed up and increase of train number.
22	Land subsidence	D	None
23	Offensive odor	D	None

Note : The grading of environmental impact level as follows :
A : Significant impact
B : Almost significant impact
C : Unknown (Survey should be necessary, on executing the project, impact may be identified)
D : Less significant impact

4) Overall evaluation

Based on results of screening and scoping through employing JICA format, a general evaluation is made as follow;

At this stage of the privatization planning, neither IEE nor EIA are required because no direct impact can be investigation for the environment. Furthermore the matter of privatization has few relation with environment. However, it is easily supposed that

some rationalization will take place when assuming a concrete plan of privatization. Namely it is considered that the people, who are living along non-profitable lines to be liquidated, receive undesirable effect for their economic activity and the impact by noise and vibration might increase along some profitable lines where train frequencies are increasing and train speed gets higher. On the other hand, though it is "unknown" as influential items for environment at present, in a reference of past examples, there are "waste, topography and soil condition, landscape, water pollution, and land subsidence". Consequently, at the execution stage of privatization, IEE or EIA being based on regulation are necessary.

(2) The tendency of the environmental countermeasures related to transport field in countries of EU and others

The railway's environment in Poland and this area of Europe, is getting better every year. To satisfy the environmental protection basis, during the time E-20 line was reform in Poland, the project contained installation of the special facilities against noise.

At present in EU, according to the pollution gases (as a carbon dioxide and nitrogen compounds) coming from the transport, the European Community settled the base level for common exhaust-gas, and is carrying this regulation into effect. Also, EU is of great concern about the environmental problem, so adjust successive progress of the technology, is beefing up the regulations. As a last activities, European Community suggested a new project of exhaust-gas purification, and it is being tested now in EU. The project prepared very strict conditions about the purification ability as well as fuel's components and quality. And it is still testing to purify it much more.
As a carbon dioxide, through improving gas mileage the amount of the exhaust-gas should be reduced to minimum, so the European Community is pushing on the European Automobile Industrial Association to undertake itself procedure.
There is no detailed information about the vehicles-amount-restricts, because it is different for each country, but it is known that there is a restriction for entering the center of the agglomeration by the large vehicles.

As well in Poland, when is going to gain the membership in EU, the same kind of measure is undertaken, and it is evident, that the restriction about the automobiles would be also strict. In following, the strict roles would be put on vehicles used before the project had been introduced. To make public transport facilities, such as railway transport and its service, better for the environment, comes to be essential condition.

Moreover, together with the tendency of specifying some procedures connecting to the environmental problem in advanced european countries, there is an international standard (ISO14000) series for the environmental management system, which was planned to fitfully safe the environment from the industrial activities of each industry and to back up the development of the society.
To size quantitatively the essence of the environmental safe-load, there was introduced LCA (Life Cycle Assessment) project, which legislates environmentally safe load for all of the production and service. Even for the railway-service among the others transport facilities, is seen as not harmful to the global-environment, because of its high amount of transport per unit energy, the more closer to the 21'st century, the need of much more improvement of its statue is required.
As if European Railway, e.g. the German one, it has its own, special private sector of the environmental improvement and corresponding to the aim which is to reduce an environmental-load, is going to use an economical-energy-cars and is getting to recycle the old ones.

Facing global environmental problem concerned with railway, we can see the earnest and a will for bringing positive achievements to the case, of european countries. It can be recognized from the existence of EU's EMAS or British BS7550, which was the prototype of ISO14000. Obviously, there is a lot of european countries facing very eagerly this problem. In Dec. of 1992, the Chairman Meeting took place in UIC. The main discuss was about the cooperation movement in the matter of the environmental protection. For that reason, there was established a special working-group. Last year started its activity UIC environmental group, what is written in TSM (Towards Sustainable Mobility) report.
Moreover, from the 1994, the Environment Protection Meeting has been held every year. Searching each country's activity connected to the railway problem, it is clearly seen, that the northern part of Europe as Germany, Denmark or Sweden, is more active than the southern one.

Denmark Railway has its own environmental protection section, holding by exclusive control staff. To give more concrete information:

a When choosing rolling stock to new roles, each maker is obliged to present LCA data, which is stated as a one point of this selection.
b According to the herbicide spreading on a railway line, there is an instruction to test the toxicity and select the specific one.

c When soil pollution survey is undertaken within possessed land, a cleanup-movement should be started if needed.
d Tree planting should be promoted on the railway area.
e There should be undertaken the waste classification project.
f Introduction of the noise countermeasures.

On state of autumn 1996, the German Railway set up in the company's research institute The Railway Environmental Center with 230 specialists who are facing the global environment problem. As a purpose of this research the following points are stated:

a To follow constituted roles and laws on the EU, each country and each district.
b To continuously progress development of the industry business, based on improvement of service facilities, flexibility, production system and also by securing the environmental acceptance.
c To reinforce a competitive power in the market, by giving strong presence to ecological privilege of the railway system.
d To take the social responsibility.

Moreover, the following aims are presented:

a Adjusting to the country's projects and aims, there is planed, till the 2005th, to rise up the amount of the transport simultaneously with reducing 25% of the energy consumption.
b To reduce harmful materials.
c To minimize the noise.
d To cut off 50% of the waste materials.
e To increase the recycling rate of rolling cars from 70% (nowadays) to 90%.

There is also a hope to get good results of reducing expenses, by economical-energy utilization, and as well, the authorization purchase of ISO14000 is under consideration.

When discussing about global environmental problem, the fact that we are victims and an assailant in the same time can not be forgotten.

The second problem facing, is a delay to understand the bad influence to the environment, caused by activities. When considering the example of the railway, the time from the beginning to the end of using the cars would be counted in the unit of ten.

In this way, the present decisions would influence very much, for yes or no, on the environmental problem. Of course, all of the cause-effect-relations are not certify but, when the problem become to be a big one, it would be impossible to manage to solve it. That's why, the point is not to be conscious too much about others and theirs activities, but to make the decisions by ourselves and to responsible for that. It is also very important to make known about environment problem. Just like we can see it in case of Swedish Car Industry. All information about the influence to the environment are published, and the Industry itself make the great effort to clear the bad side of the cars' production. Then, basing on those information's, it is going to be possible to chose the product suitably to our lifestyle.

(3) Suggestions to the environmental-protection

Based on the evaluation of each environmental-problem testing list, which depends on scoping, in case the privatization is surpassingly carried into effect, the way of dealing with the problem of an influence to the environment, which is mentioned in A - C suggestions, is put in order in the following table.

Table 3.1.9 Suggestions about the environmental-protection

	Supposed impact	Countermeasure
Economic activities	Transportation loss with the abolition of unprofitable lines.	To secure the transport system by the other kind of transport.
Wastes	The waste-production with the facilities on the institution's reform at large scale.	To make the disposal-plan, and to secure the suitable dump site.
Topography and soil condition	Landslide with the large-scale excavations.	To facilitate hard waterproof pipe system.
Landscape	Demolition of the landscape with the new infrastructure.	To design the urban infrastructure, not to be obstacle for the natural scenery.
Water pollution	The drainage with the construction.	To prepare water treatment system for the drainage.
Noise and vibration	Noise and vibration with the increase of the number of trains and the high speed.	Not to make present situation worse, by building soundproof walls and improving track structure.

3.1.5 Policy to Maintain Railway Transport

(1) Role of government, etc. on the preservation of the railway transport

A railway enterprise shall be administered, by the principle applied to a civil enterprise in the EC's Directive No. 91/440, it is prescribed that the said principle should be respected also in the category of public service obligation forced by the nation, etc. (Art. 5)

From this sense the economic principle has a priority first at the time of preservation continuance for the railway business, and in case the current balance of routes is constantly deteriorated and no prospect is given as a going concern, it is indicated that there may be a case to be withdrawn from the corresponding railway service. By the establishment of the Railway Business Law, it is supposed that the railway transport business from now on will become a license undertaking, if it is a business entity satisfying the conditions, it can freely enter into the market, and for the service to render and the tariff setting an enterprise freely carry out as a basic style. For this reason, it is considered that the unprofitable transport field in the railway sector, for example, the preservation of the railway traffic in the local transport, etc. that a large expectation cannot taken in the quantity of demand will come to a issue . As the situation supposed in this case, two cases are considered: ① a case to intend the preservation continuance of railways by the rules other than the market economic principle by any measure, and ② a case to change over to the transport by other means of bus transport, etc. The latter is a case to shift to the alternative transport system with higher economic validity on its demand scale, and what becomes issues at the railway side is relatively little. The issue is very large for the case of ① being that in case the continuance of railway business is intended in spite of that the economic validity is lost in the railway transport. This means such a case that the railway service rendering on the basis of the social need even though it is decided as unreasonable, and the finance charge adjustment between the business entity and the beneficiary comes to become a issue. Concerning public traffic service liabilities in local governments, through the Law on Local Self-governing Body established in 1990, the local public transport (mainly aiming at the bus transport) was included in liabilities of municipality self-government bodies, That is to say, under this law frames, the organizers of local transport and the offer itself were institutionally separated concerning the transport service quantity and quality necessary, the former assumes a role to determine the frame as to the quantity and quality of service necessary as the municipal public transportation from viewpoints of the social benefit, and the latter was specialized to be a business activity as the main supplier of public transport services.

The two conclude a contract as to the traffic service required, and prescribe the particulars (frequency of progress, routes and subsidies) of service rendering in a scope of financially realizable and socially justified services. The transport business entity acting as a transport service provider has rendered necessary transport services on the basis of this contract. Concerning the preservation of railway routes, the system similar to this is possible, and it is desirable to start the examination of a contract as to the transport service rendering among the government, local governments and railway business entity in the future.

(2) Transport market segmentation

In the passenger transport of the present PKP, little concern is given to the differences of transport market characteristics between the inter regional transport and intra regional transport . For these two transport markets, it is not adequate to apply the same principle of business administration because of differences, etc. in the social meaning directed to the transport business. Also regarding the preservation of the railway transport, in the domain of interurban services covering the whole country, for the PKP that fostered the administration, technology and transport know-how as the leading role of unique domestic railway transport up to now, its participation to the business is justifiable also from now on, however for the municipal zone transport service that should examine the quality and quantity of the transport service in accordance with the transport need limited in a specific region, there is few reason for the PKP to take part such transport services directly also in the future, and rather it is desirable to assume the liabilities in the transport business at local level and/or at local self-governing organizations.

3.2 EXPERIENCE OF RRIVATIZATION OF RAILWAYS IN JAPAN AND WEST EUROPEAN COUNTRIES AND SUGGESTION TO PKP REFORM

3.2.1 Reform of Japanese National Railways

(1) Background

Due to changes in the industrial structure and increases in the income of people, transport by automobile and airplane has rapidly developed in Japan since the 1960s. In this process, the Japanese National railways (JNR) steadily lost its market share, as it was not able to innovate its management or improve productivity to promptly cope

with changes of the time and circumstances surrounding the railway industry.

JNR was not able to cope with changes in the transport structure mainly for the following reasons.

①As JNR was a public corporation, the Diet and the government intervened in the budget, appointment of executive members, fares, investment and other important management affairs. Fares were politically determined to lose chances of timely revision. Thus, the spirit of autonomous management had gradually been lost.

②The labor-management relation gradually worsened, as the management wasn't given competence of self-determination, while labor unions didn't have cost-consciousness or morale for productivity increase. Either labor or management was not sufficiently conscious of the reality of business and the relation in between had gradually become abnormal.

③JNR invested an astronomical amount of funds in various projects including construction of Shinkansen lines, most of which were appropriated with borrowed money to snowball debts and lose normalcy of finance. In 1981, funds invested accounted for 32% of revenue and 70% of outstanding debts were due to capital investment.

④JNR was a mammoth organization to cover the nationwide railway network with about 300,000 employees. Policies of the top didn't efficiently prevail to field units all over the country, to expose the limit of management and control as a single organization.

⑤As the Head Office in Tokyo concentratedly managed the nationwide organization, it was not able to cope with different conditions in different areas. The management of revenue and expenditure in package over the entire network caused irrational inter-division and inter-region reliance.

⑥As JNR was a nationwide organization without competitors, employees were not conscious of competition.

Thus, the financial position of JNR gradually worsened to accumulate long-term debts. In 1984, payment of interest exceeded 30% of revenue. Subsidies by the government made an unbearable burden in the national budget. Under the circumstances, the

government started to drastically restructure JNR.

(2) Special Features of JNR Reform

From the viewpoint of traffic density and assets of JNR, it was foreseen that railways can be self-subsistent, if some innovative measures have been taken. For this reason, following policies were implemented to reform the operation of JNR.

①Division and Privatization of JNR

In 1987 April, JNR was divided into six passenger railway companies and a freight railway company with all stocks held by the government. The government planned to sell stocks while considering the management achievement of each company. As of 1997 October, stocks of three companies have already been released to the public. Division and privatization of the former JNR have succeeded in clarifying the responsibility of management, decreasing internal subsidies between different divisions, introducing competition consciousness, stabilizing the labor-management relation and promoting community-related marketing.

②Disposal of Debts in the Past

Newly organized JR companies will not be viable, if they succeed the total amounts of long-term debts of JNR and the pension for retired employees. It has been decided, therefore, that JR companies bear 8.4 trillion yen as the price of assets they have received from JNR and an amount of 14.5 trillion yen more, with the balance being transferred to the newly organized JNR settlement Corporation (JNRSC). It was planned to reimburse the debts of JNRSC by selling lands and stocks at an amount of 8.9 trillion yen with the balance, 13.8 trillion yen, borne by the national exchequer (tax). As sales of lands and stocks have delayed, however, it is anticipated that the burden on tax payers will amount to more than 20 trillion yen including the accumulated interest.

③Treatment of Excess Employees

The number of JNR employees was 277,000 as of 1986 April. The JNR Reconstruction Supervisory Committee calculated the appropriate number of employees to be 168,000 by referring to the numbers of employees of private railway companies in Japan. When JNR was split and privatized, newly born JR

companies took over 200,000 employees, or 20% more than the appropriate number calculated by the Committee. This left 77,000 employees as excessive labor force. To encourage early retirement, JNR collected volunteers who want to retire by receiving a retirement allowance added with an amount of ten-month salary. While JNR planned to collect 20,000 volunteers, 39,000 employees retired by taking advantage of this privilege. The government set up "JNR Employees Re-employment Promotion Headquarters" headed by Prime Minister, and enacted the "Special Re-employment Measures Law." The Law also imposed obligation on governmental organizations and local autonomous bodies to make efforts to employ workers resigned from JNR, implement employment exchange services, perform vocational training and extend assistance to workers for re-employment. Based on the provisions in the Law, the government influenced local autonomous bodies and industries to employ workers resigned from JNR. As a result, those who left JNR were all re-employed in three years by 1990 April.

④Disposal of Excess Assets

JNRSC took over excess assets, long-term debts and lands of 8,800ha out of 62,000ha possessed by JNR. By fiscal 1995, JNRSC sold 3,500ha to obtain revenue of six trillion yen. Of these lands, 85% were sold through private contracts and 12 % through competitive bidding. After JNRSC is disorganized in fiscal 1998, remaining excess assets will be transferred to a different governmental organization.

⑤Measures to Stabilize Management

Three newly organized JR companies with small volumes of transport were exempted from taking over JNR's long-term debts, as their management basis is not stable. In addition, management stabilizing funds, 1.278 trillion yen in total, were provided to these three companies. The amount was calculated so that these companies can secure a profit of 1% by adding the interest from the funds to revenue. The amount was included in the debts transferred to JNRSC, which is virtually borne by the government, however.

JR companies are now in a paying business thanks to the financial assistance by the government, measures to smoothen the process to the privatization of JNR, spiritual reform of employees, establishment of sound labor-management relation, productivity increase, improvement of customer services with fares unchanged and increases in the volume of transport due to economic recovery.

3.2.2 Reform of British Rail

(1) Background

The United Kingdom, who started railway operation in 1825 for the first time in the world, enacted the Transport Law 1947 to nationalize all transport businesses including railways and place them under government control. British Rail (BR) was born when this policy was revised by the Transport Law 1962 to divide nationalize enterprises into business-wise separated organizations.

In the 1980s, the government promoted privatization of national enterprises including those of land transport, bus services and air transport, when BR was left unchanged as its stocks didn't seem to sell well due to its poor business results. Although BR made efforts to cut employees, abolish unprofitable lines and implement various measures for rationalization, its management didn't take a favorable turn. To revitalize the railway business, therefore, measures were looked for to transform BR to a private organization that would be able to fulfil its function on its own feet.

In 1992 July, the government published a white paper that included the following polices to privatize railway businesses. Namely, the government: ① Nominates different companies to undertake train operation and the management of infrastructure. ②Adopts a franchise system to license the right of train operation to a private company through competitive bidding.

Based on the BR reform plan reported in this white paper, the Railway Law was put in force in 1993 November to divide BR into more than 90 companies in 1994 April.

(2) Special Features of Reform

Special features of the reform of BR were to: ①Drastically fractionize railway businesses in order to expedite competition. ②Introduce a franchise system. ③Set up the Passenger Railway Franchise Board to implement a franchise system and supervise railway companies, and the Railway Supervision Board to expedite competition among these companies, protect the interest of users, promote efficient utilization of railway networks and control Rail Access charges.

Passenger transport was divided among 25 companies. The right of operation was granted to a bidder who required the minimum amount of subsidies among bidders. After BR was privatized, however, subsidies of the government had substantially increased, from 523 million pounds provided to BR in 1992 to 1,980 million pounds in 1996. Although the Franchise Board predicts that subsidies will decrease in the future, to 1,842 million pounds in 1998 and further to 764 million pounds in 2004, the

financial burden on the government will not decrease for the time being. It is planned not to implement an open access to passenger transport until 2004.

Freight transport was divided among three companies. They are a coal and petroleum transport company, a container transport company and a channel tunnel transport company, who are now in different financial situations. The channel tunnel company has accumulated a large amount of debts.

A nationwide company called the Rail Track Company (RT) was established to manage infrastructure, who controls the right of access, compile a time table, maintain tracks and signals, and invest in infrastructure. In 1995, RT earned 2.27 billion pounds in total including 2.1 billion pounds and 80 million pounds from leasing tracks and real estate, respectively, and spent 1.97 billion pounds for investment and maintenance of tracks.

3.2.3 Reform of Swedish State Railways

(1) Background

Sweden enacted a law to nationalize railways in 1939 and organized the Swedish State Railways (SJ). SJ fell into a financial crisis, as the railway network is too large in comparison with the population and the area of territory, and the volume of transport dropped due to the rapid development of automobiles in and after the 1950s. Therefore, the government enacted a transport policy law in 1963 to start a system to bear the costs of unprofitable services of SJ. The government amended the law in 1979 to limit the responsibility of SJ only to the operation of commercially profitable lines. For unprofitable lines that must be maintained to meet social requirements, provisions were made to provide SJ with subsidies from local autonomous bodies. Nevertheless, the finance of SJ didn't improve. The government again amended the law in 1988, therefore, to separate the operation and infrastructure divisions of SJ into two different organizations. Thus, SJ was entrusted with train operation and the newly organized Swedish Railway Board (BV) with the management of infrastructure.

(2) Special Features of Reform of Swedish Railways

Both SJ and BV are a public organization with their operation not privatized and transport and infrastructure managed separately. This is a railway management system that has been adopted for the first time in the world. SJ is in charge of freight transport over the entire railway network and passenger transport on trunk lines.

Passenger transport on local lines is performed by contractors who have been selected through competitive bidding by local autonomous bodies with whom the management of these lines is entrusted by the government. In most cases, however, SJ has been a successful bidder to contract the operation of local lines.

SJ pays Rail Access charges to the national exchequer and BV is compensated for track control and maintenance costs and funds for investment by the national budget. In 1995, SJ gained a business income of Kr 12 billion with expenses of Kr 10.8 billion, and paid rental charges of Kr 750 million which was only 7% of the total expenditure. BV was allocated with a budget of Kr nine billion from the general account, spent Kr three billion for track maintenance and invested Kr six billion in tracks. Rail Access charges paid by SJ account for about 8% in the annual budged of BV.

One of the special features of railway reform in Sweden is that the government maintains railway facilities by regarding them as the assets of the country, and invest a large amount of funds to maintain the railway network in the same way as for other transport modes including road transport.

3.2.4 Reform of German National Railway

(1) Background

The German National Railway was established in 1920 when railway networks in the country were nationalized. When Germany was divided into West Germany and East Germany in 1951, the German National Railway was also split into the German Federal Railway (DB) in the west and the German State Railway (DR) in the east.

While the volume of transport in West Germany increased to a large extent, transport by rail hovered low to worsen the financial status of DB. The government provided DB with subsidies to a total of 54 billion Mark from 1975 to 1990. However, long-term debts of DB snowballed every year to 50 billion Mark until 1990.

Although DR had played a leading role in passenger and freight transport in controlled markets on the other hand, its market share and the volume of transport sharply dropped since 1990 due to changes in the market structure. As it had excess employees and superannuated railway facilities and rolling stock, DR required investments for modernization.

Under the circumstances, the government determined in 1992 July to integrate DB and DR, set up a railway liquidation corporation and separate infrastructure divisions and railway transport divisions into different organizations after preparations have been made in the future. Based on such plans, the government enacted a railway reform

law in 1993 December.

(2) Special Features of Reform

As special Features of the railway reform in Germany, the government integrated DB in the west and DR in the east, established a federal railway asset organization (BEV) to manage long-term debts, excess assets and employees of DB and DR, set up a federal railway board (EBA) to plan railway networks and license and supervise railway operation from a technological viewpoint, and provided a large-scale financial assistance to the newly organized German Railway Co., Ltd. (DBAG) to cover long-term debts and pension funds.

To make DBAG stand on its own legs, the government took the following financial measures. ① Reduction of the book value of assets ②Exemption from all debts with interest (about 70 billion Mark) ③ Investment in projects to modernize DB ④Exemption of DB from the burden of pension funds The government also provides subsidies based on the local area development law to autonomous bodies for the operation of local railway lines.

As the government took such financial measures and contracted suburban passenger transport with autonomous bodies, DBAG which was set up in 1994 January recorded a profit of 180 million Mark in 1995.

The organization of DBAG was separated into three internal independent divisions, i.e., the passenger, freight and infrastructure divisions. These three divisions will be instituted as different private companies after some time in the future. Regarding the infrastructure company to be set up in the future, the government take charge of investment while holding a majority of stocks.

When DGAB was set up, 355,000 employees of DB and DR were taken over in principle by DGAB, BEV and EBA. DBAG will reduce the number of employees by 100,000 in ten years.

3.2.5 Reform of French National Railway

(1) Background

Under an agreement between the government and railway companies, the French National Railway (SNCF) was established to cover the entire railway network in the country. SNCF concluded a contract with the government to perform public transport services and be compensated for losses incurred from the operation of unprofitable

lines.

The amount of compensation by the government has increased every year to account for 70% of the revenue of SNCF in the 1980s. While starting the operation of high-speed TGV in 1981, SNCF had played a leading role in the age of high-speed railway transport. However, the stagnated volume of transport and increases in capital costs due to the investment in the construction of high-speed railway network oppressed the management of SNCF to increase the amount of subsidies by the government to 51 billion franc in 1995.

Therefore, the government introduced a bill to the Diet to drastically reform SNCF by the following measures.

①SNCF shall operate trunk lines alone, with the operation of local lines entrusted to autonomous bodies.

②The infrastructure of SNCF shall be transferred to a newly established public organization.

③Two-thirds of the debts of SNCF (175 billion franc as of the end of 1995) shall be taken over by the new public organization.

④The government will transfer the cost of infrastructure hitherto compensated for to SNCF, 13 billion franc per year, to the new public organization, and provide 12 billion franc to the organization every year to reimburse the transferred debts.

(2) Special Features of the Reform of SNCF

In 1997 February, the said bill passed the Diet to institute a railway track corporation (RFF) who manages the infrastructure and grant an exclusive license to SNCF for transport on trunk lines and maintenance of tracks contracted with RFF. RFF took over the infrastructure, excess assets, debts of SNCF to an amount of 134.2 billion franc. RFF's revenue consists of rental charges for track paid by SNCF, sales of excess assets and subsidies from the government and autonomous bodies.

SNCF possesses railway station buildings, rolling stock, rolling stock bases, workshops and other buildings, prepares transport plans and performs train operation control. As a result, SNCF who suffered a loss of 15.2 billion franc in 1996, will recover the balance between revenue and expenditure in 1998.

As special features of the reform of French National Railway, SNCF was exempted from a majority of long-term debts to expedite its restructuring. Simultaneously, the government set up a public organization who is responsible for raising capitals and investing in infrastructure. By doing so, the government clarified the responsibilities of the infrastructure and transport divisions. The government also transferred the management of local lines to autonomous bodies in respective regions.

3.2.6 Suggestion to PKP Reform

(1) Railway reforms in Japan and west European countries were triggered when they fell into a financial deficit to require huge amounts of subsidies from respective governments. Except some private railway companies in Japan who are enjoying high density transport demands and can undertake railway transport without obtaining subsidies from the government, it is very difficult for railway companies to balance revenue and expenditure while maintaining tracks and implementing capital investment. Therefore, management stabilizing funds have been established in Japan for vulnerable companies with small transport demands to add the interest from the funds to their revenue. In western Europe, governments are providing subsidies to passenger transport and infrastructure divisions. Given the low transport density of PKP, it is indispensable for the Polish government to extend subsidies to passenger transport businesses and invest in the infrastructure.

(2) A common feature among various countries who have reformed national railways is that the respective government implemented large-scale financial measures. One of the reasons why governments must have borne such large financial burdens is that they have to dispose of long-term debts of national railways as seen in Japan, Germany and France. To make reformed railways stand on their own legs, governments have also to invest in infrastructure. As the source to deal with such financial burdens, funds from the national budget are appropriated; excess assets were sold (in Japan, Germany and France); stocks were released (in Japan) and the revenue from road transport is appropriated (in Germany and France). Fortunately, PKP doesn't have long-term debts. However, investment in facilities has been insufficient. Before PKP is privatized, therefore, it is required for the government to increase the investment funds to modernize facilities and rolling stock.

(3) To make railways operate efficiently and improve productivity, provisions have been made in each country to expedite competition in railway businesses and clarify the responsibility of railway management. As a means to do this, national railways were divided to induce competition among different railway companies and new railway promoters were approved to start railway transport businesses. To provide freedom of management and autonomy to railway companies, they have been privatized. It is required for Poland as well, to introduce an open access system by separating infrastructure and transport divisions, and privatize PKP by dividing transport divisions into a plurality of entities.

(4) Public organizations have been set up in various countries to assist reforming national railways, including the control agencies in Germany and the UK, the infrastructure control agencies in Sweden and France, and the settlement corporations in Japan and Germany. Control agencies are set up when existing governmental organizations cannot fully cope with reforming railways. Infrastructure agencies are organized when the government largely intervene in infrastructure divisions. Settlement corporations are instituted when a national railway has a huge amount of long-term debts to mainly take charge of its disposal. In Poland where a chief inspector system is in force and PKP doesn't have long-term debts, it must be discussed whether organizations like those set up in other countries are necessary, by taking into account conditions specific to the country.

(5) Among different countries, a common factor that has worsened the balance between revenue and expenditure is the excess employees. However, curtailment of employees is very difficult, as labor unions oppose it. In addition, there are few recipients for discharged workers. In the case of JNR reform, the government took the initiative in re-employing 77,000 excess employees and made efforts for referral. JNR encouraged early retirement by paying extra amounts in addition to retirement allowance. In Poland, the problem of excess employees is a key to the reform of PKP. The government is required, therefore, to take the initiative in solving this problem.

(6) Countries who have reformed their national railways clarify businesses in which railways can exhibit their advantages and those where railways are not advantageous. A typical case of the latter is the operation of local lines. Unprofitable local lines, which must be abolished in principle, are entrusted to the finance and management responsibility of local autonomous bodies, in case they must be maintained from the viewpoint of social and economical needs of respective communities. It is also required for Poland to clarify the responsibility and burdens to be borne by autonomous bodies for the operation of local lines.

3.3 TARIFF STRUCTURE AND FARE ANALYSIS

3.3.1 Existing Tariff Structure

(1) Tariff system

Present PKP tariff system, being adapted to passenger and freight transport, reflects 2 components being contrary to each other . The first is that some part of present tariff involves official price regulated by the Government price control and the second is that present tariff is mainly based upon the commercial view, taking account of the market situation and policy . Meanwhile, the specific fare discount system is also introduced from both statutory and marketing viewpoint and such a fare reduction system should be also included when considering PKP fare system . Furthermore, the State has subsidized PKP by compensating the revenue loss of passenger transport and it is considered that such a subsidiary has significantly related to PKP fare system .

A) Substantially PKP tariff is controlled by the Government policy through the so-called official price which is applied to passenger and freight fare .

B) It is necessary to take account of several fare related matters like discount fare and government subsidy with considering the present fare system, because they will affect the realization of fare system in practice .

However as mentioned in several EC directives, future railway management should be legally and economically independent from the Government regulation, and this means any railway enterprises can make independently their own business plan, including own fare and tariff system . Present situation indicates the fare system allows public intervention through the official price system and the discount system, and it is considered that the railway business principle should be established through separating its commercial activity from the social obligation charged to railway, negotiating with the State and local Government .

(2) Related legal system

As mentioned above, many statutory rules are related to present railway fare, it is necessary to review the existing fare system,taking account of interrelationship between the fare system and related statute . The related statute comprises not only the law concerning public transport sector, including railway, but general law concerning social economic sector . These relationship is summarized in figure 3.3.1 .

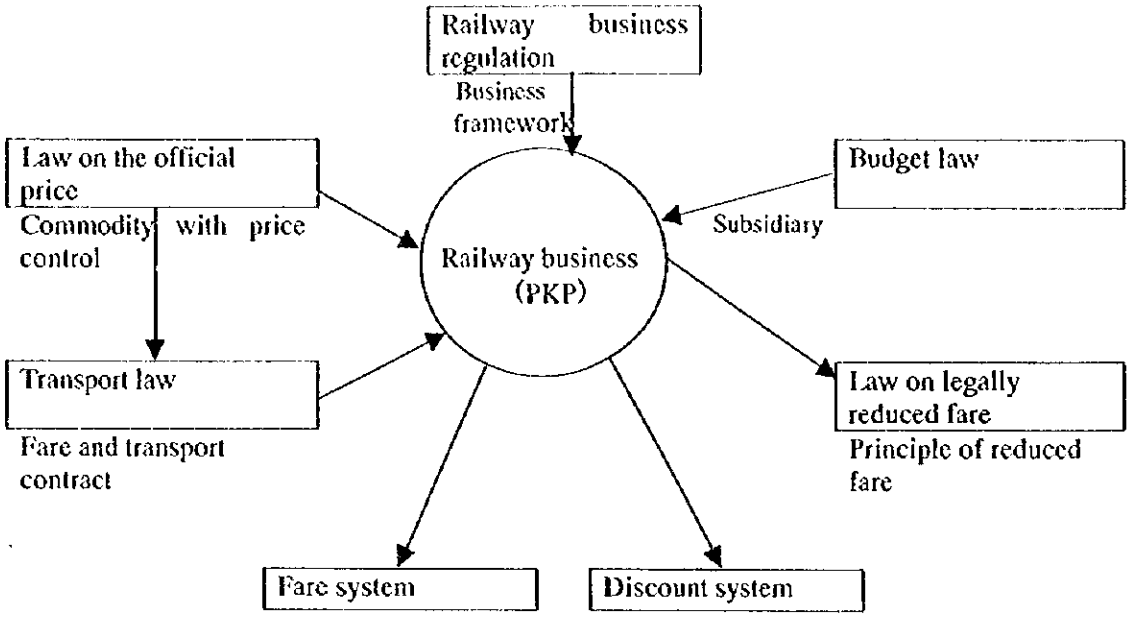


Figure 3.3.1 Interrelationship of statutory system related to fare

The prescription of related legal system is shown in table 3.3.1 .

Table 3.3.1 Outline of the law related to fare system

Item	Prescription	Legal background
Competence of PKP in the settlement of fare	Board of management is approved to settle fare by itself .	Art. 32 of law on PKP Art. 11 of Transport law
Application of official price for the railway fare	The minister of transport and finance can introduce official price for the public transport including railway if necessary .	Official notice of the minister of transport, based upon art. 18 of price law . Amendment of art. 2 of transport law
Official price for passenger railway transport	Official announcement of passenger fare for normal and season ticket .	Directive by the minister of transport
Official price for freight railway transport	Official announcement of freight tariff for the transport of specific commodity, coal freight to the power plant and ore .	Ditto
Free and reduced charged transport	Range and definition of legal privilege for free and reduced charged transport .	Law on the special right of reduced charged transport

(3) Tariff structure

1) Passenger tariff

There are 4 kind of tariff tables applied for PKP passenger fare .

①Basic fare : is applied to normal ticket fare by train types, to season ticket fare passenger and to suburban train ticket fare .

②Baggage fare : is for parcel, bicycle accompanied with boarding, baby carriage and vehicle .

③Other charge : charter fare etc.

④Extra charge : for reserved seats and sleeping berth .

a) Normal ticket

- Passenger fare is fixed by the train type, including normal train, fast train and qualified train, and the seat classes, that is 1st and 2nd class .
- As a fare difference is equal to the 50% of 2nd class fare in normal train between any neighboring upper rank, the fare structure is rather simple and clear for users .
- Typical fare difference is as follow ;

  Fast train fare = Normal train fare times 150%

  Qualified train fare = Normal train fare times 200%

Accordingly,maximum fare difference occurs between the highest fare, qualified train 1st, and the lowest fare, normal train 2nd, and the ratio becomes 3 to 1, comparing the fare in same haul range .

- Average tariff is decreasing according to its travel distance .
- Among normal train ticket, official price is applied to the 1st and 2nd class fare of normal train through the directive of the minister of transport .

Table 3.3.2 PKP PASSENGER TRAIN FARES 1997

Travel Distance (km)	PRICE of NORMAL TICKET					
	Ordinary		Fast		Express	
	I	II	I	II	I	II
1 - 10	1.80	1.20	2.70	1.80	3.60	2.40
11 - 20	3.00	2.00	4.50	3.00	6.00	4.00
21 - 30	4.35	2.90	6.53	4.35	8.70	5.80
31 - 40	5.55	3.70	8.33	5.55	11.10	7.40
41 - 50	6.60	4.40	9.90	6.60	13.20	8.80
51 - 60	7.80	5.20	11.70	7.80	15.60	10.40
61 - 70	9.00	6.00	13.50	9.00	18.00	12.00
71 - 80	10.05	6.70	15.08	10.05	20.10	13.40
81 - 90	11.10	7.40	16.65	11.10	22.20	14.80
91 - 100	12.15	8.10	18.23	12.15	24.30	16.20
101 - 120	13.35	8.90	20.03	13.35	26.70	17.80
121 - 140	14.40	9.60	21.60	14.40	28.80	19.20
141 - 160	15.60	10.40	23.40	15.60	31.20	20.80
161 - 180	16.65	11.10	24.98	16.65	33.30	22.20
181 - 200	17.70	11.80	26.55	17.70	35.40	23.60
201 - 220	18.75	12.50	28.13	18.75	37.50	25.00
221 - 240	19.50	13.00	29.25	19.50	39.00	26.00
241 - 260	20.40	13.60	30.60	20.40	40.80	27.20
261 - 280	21.00	14.00	31.50	21.00	42.00	28.00
281 - 320	22.05	14.70	33.08	22.05	44.10	29.40
321 - 360	23.10	15.40	34.65	23.10	46.20	30.80
361 - 400	23.70	15.80	35.55	23.70	47.40	31.60
401 - 440	24.60	16.40	36.90	24.60	49.20	32.80
441 - 480	25.50	17.00	38.25	25.50	51.00	34.00
481 - 520	26.40	17.60	39.60	26.40	52.80	35.20
521 - 560	27.60	18.40	41.40	27.60	55.20	36.80
561 - 600	28.50	19.00	42.75	28.50	57.00	38.00
601 - 640	29.40	19.60	44.10	29.40	58.80	39.20
641 - 680	30.30	20.20	45.45	30.30	60.60	40.40
681 - 720	31.20	20.80	46.80	31.20	62.40	41.60
721 - 760	32.10	21.40	48.15	32.10	64.20	42.80
761 - 820	33.00	22.00	49.50	33.00	66.00	44.00
821 - 880	34.20	22.80	51.30	34.20	68.40	45.60
881 - 940	35.10	23.40	52.65	35.10	70.20	46.80
941 - 1000	36.00	24.00	54.00	36.00	72.00	48.00

b) Season ticket

- Season ticket consists of the sectional season ticket, the district season ticket and the suburban section ticket .
- The sectional ticket allows a holder to get on and off trains freely at any stations between the section shorter than 100 km .
- The sectional ticket is divided into two kind, one is nominal ticket and another is

anonymous ticket .

- The validity of ticket covers types of 1 month, 3 months and 6 months .
- There are 2 seat class available, 1st and 2nd classes of which fare difference is 50% of the fare lower rank ticket .
- Comparing with the normal ticket, the season ticket is discounted about 50% and the discount rate increases according to its validity .
- The district season ticket is such a ticket that its availability is limited not only in the section but wider area covering several DOKP districts .
- The district ticket is divided into two kind, one is nominal ticket and another is anonymous ticket .
- The validity of ticket covers types of 1 month, 3 months, 6 months and 1 year .
- Average fare of the district ticket is 6 times larger than the sectional ticket .

Table 3.3.3 Season ticket

Type of Ticket	Train	Class	Normal Ticket Fare	Season Ticket Period					
				1 month		3 months		6 months	
				Fare in zl	Disc.	Fare in zl	Disc.	Fare in zl	Disc.
Sectional Nominal Ticket *1	Ordinary	2nd	2.0	44.00	0.5	110.00	0.6	198.00	0.7
		1st	3.0	66.00	0.5	165.00	0.6	297.00	0.7
		2nd-50%	1.0	22.00	0.5	55.00	0.6	99.00	0.7
		1st-50%	1.5	33.00	0.5	82.50	0.6	148.50	0.7
Sectional Anonymous Ticket *1	Ordinary	2nd	2.0	55.00	0.4	137.50	0.5	247.50	0.6
		1st	3.0	82.50	0.4	206.25	0.5	371.25	0.6
	Rapid	2nd	3.0	82.50	0.4	206.25	0.5	371.25	0.6
		1st	4.5	123.75	0.4	309.38	0.5	556.88	0.6
District Nominal Ticket *2	Ordinary	2nd	-	268.40	-	671.00	-	1,207.80	-
		1st	-	402.60	-	1,006.50	-	1,811.70	-
		2nd-50%	-	134.20	-	335.50	-	603.90	-
		1st-50%	-	201.30	-	503.25	-	905.85	-
District Anonymous Ticket *2	Ordinary	2nd	-	335.50	-	838.75	-	1,509.75	-
		1st	-	503.25	-	1,258.13	-	2,264.63	-
		2nd-50%	-	167.75	-	419.38	-	754.88	-
		1st-50%	-	251.63	-	629.07	-	1,132.32	-

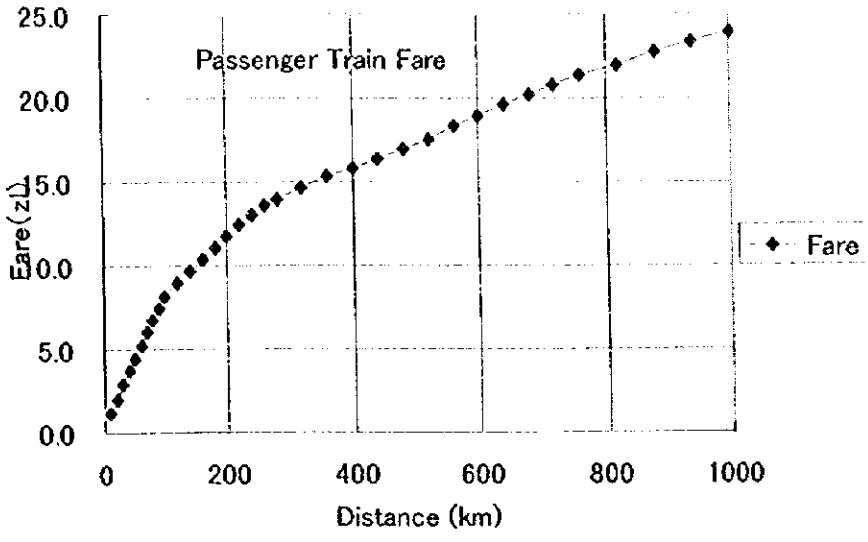
Note) 1. Fare calculation is made, supposing 20 km as a section length of sectional ticket.

2. Fare calculation is made,supposing trips moving between two DOKP.

3. Discount ratio is an estimation made by author .

Source) Tables of transport charge PKP in 1997

Average tariff of passenger fare is reduced by haul as shown in figure 3.3.2 .



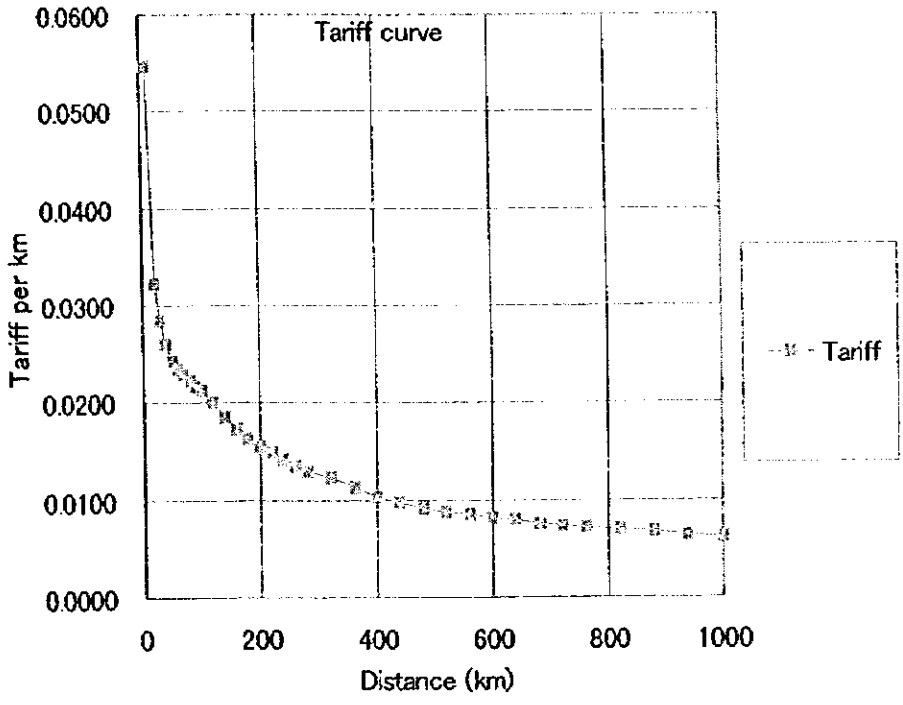


Figure 3.3.2 Passenger fare and tariff distribution by haul

2) Freight tariff

①Basic freight tariff for standard wagon load (table A)

Basic tariff is fixed according to the haul length of freight, considering transport to use the 25 ton capacity wagon with 2 axles . There are two types of tariff available, one of which is the official price for coal and ore transport and another is for the commodity transport other than coal and ore .

Rate change with loading volume and using different wagon other than standard wagon (25 ton load) is calculated by a conversion table .

②Tariff for narrow gauge track section (table B)

This tariff is applied for the transport in narrow gauge section .

③Tariff for piggy back transport (table C)

④Tariff for the UTI (standard loading unit) (table D)

⑤Tariff for ferry transport between Poland and Sweden (table E)

⑥Special charge

Special charge is applied for the use of siding, the measurement of cargo weight, loading and unloading and custom clearance etc.

Surcharge of the transport for hazardous material is as follows ;

50% surcharge is applied for the special hazardous, the explosive, the liquefied gas and the radioactive substance . 25% surcharge for other hazardous material .

When using special wagons like a wagon with refrigerator, extra long wagon and lower decked wagon etc., 10% surcharge is applicable .

Tariff rate is decreasing by haul length and its change is large till 200 km of length as shown in figure 3.3.3 .

(1) Coal and iron ore

Distance in km	Weight(tones) 10	15	20	25
50	13.56	11.15	9.69	8.72
100	18.60	15.29	13.29	11.96
200	28.61	23.52	20.45	18.40
300	38.69	31.80	27.65	24.88
400	48.76	40.09	34.85	31.36
500	58.84	48.37	42.05	37.84
600	68.92	56.66	49.25	44.32
700	78.99	64.94	56.45	50.80
800	89.07	73.22	63.65	57.28
900	99.15	81.51	70.85	63.76
1000	109.22	89.79	78.05	70.24
1200	129.38	106.36	92.46	83.20

(2) Other products

Distance in km	Weight(tones) 10	15	20	25
50	14.93	12.27	10.67	9.60
100	20.46	16.82	14.62	13.16
200	31.47	25.87	22.49	20.24
300	42.54	34.98	30.40	27.36
400	53.62	44.08	38.32	34.48
500	64.69	53.18	46.23	41.60
600	75.76	62.28	54.14	48.72
700	86.83	71.38	62.05	55.84
800	97.90	80.48	69.96	62.96
900	108.97	89.59	77.88	70.08
1000	120.05	98.69	85.79	77.20
1200	142.19	116.89	101.61	91.44

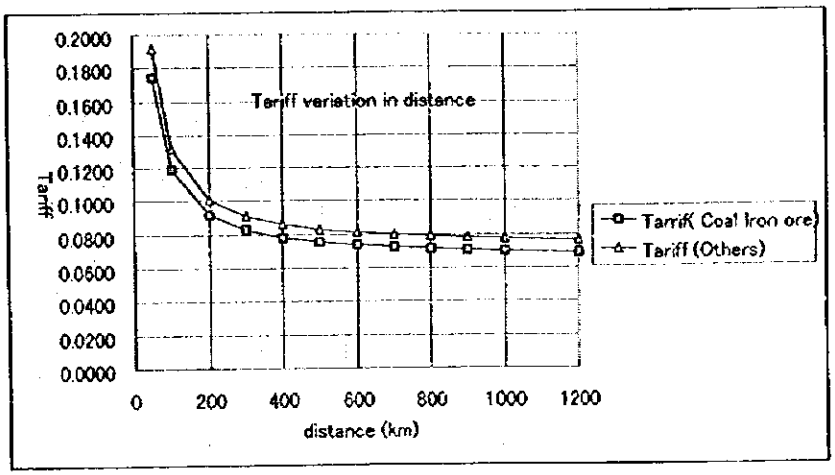


Figure 3.3.3 Freight tariff distribution by distance

(4) Discount system

Regarding PKP passenger fare system, many kind of fare discount is made for the specific passengers . The discount system are comprised of that determined by law and by market policy of PKP and its contents are specified by reduced rate and application . The scope of fare discount by each recipient group is shown in table 3.3.4 .

Table 3.3.4 Passenger fare discount system

Cause of discounting	Group to get advantage	Content of discounting
By law	Members of parliament	Free of charge
	Pupils with handicap and their caretaker, the blind and their caretakers, caretaker for the disabled person	
	Infant below 4 years old, border guard, custom officer,	
	Police officer on duty, military person on duty	
	Highly handicapped person of 1st grade	Free of charge for normal train,2nd class
		50% discount for normal train,1st class qualified train 2nd class
	Child before elementary school, military personnel off duty, person belonged to union, the war disabled, the blind	50% discount
	Student until 26 years old	50% discount for 2nd class
	Teacher, Professor	50% discount for normal train,2nd class
By transport operator	Employees, pensioners and their family	Free of charge or discounting

3.3.2 Fare Level

(1) Comparison of railway fare level

Comparable fare level is shown in Table 3.3.5 and 3.3.6 for the rail passenger fare and the rail freight fare among the Europe countries . This chart shows the relative fare level between each countries, converting the real fare per unit transport into the universal money term (purchasing power parity) .

According to this table, the PKP fare is staying at lower level than that in western countries and the passenger fare is in particular . This is because present PKP fare includes some aspect of the official price as mentioned before .

Table 3.3.3 Statistics on Passenger Railway Revenue (Fare / P * km)

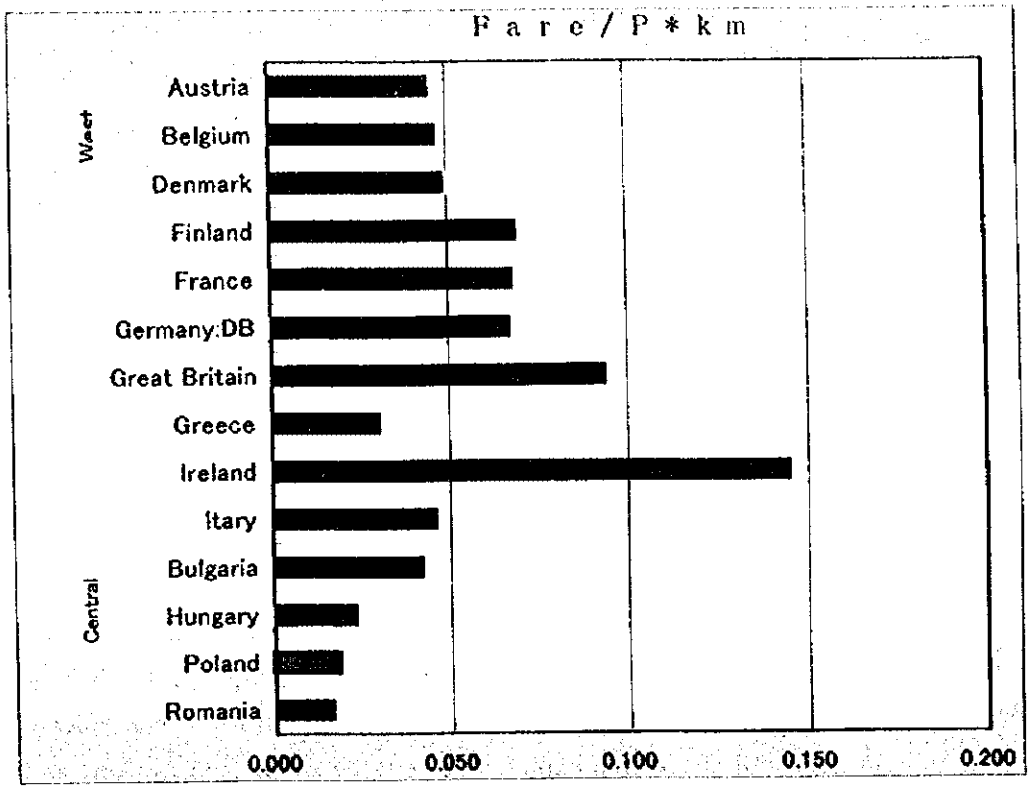
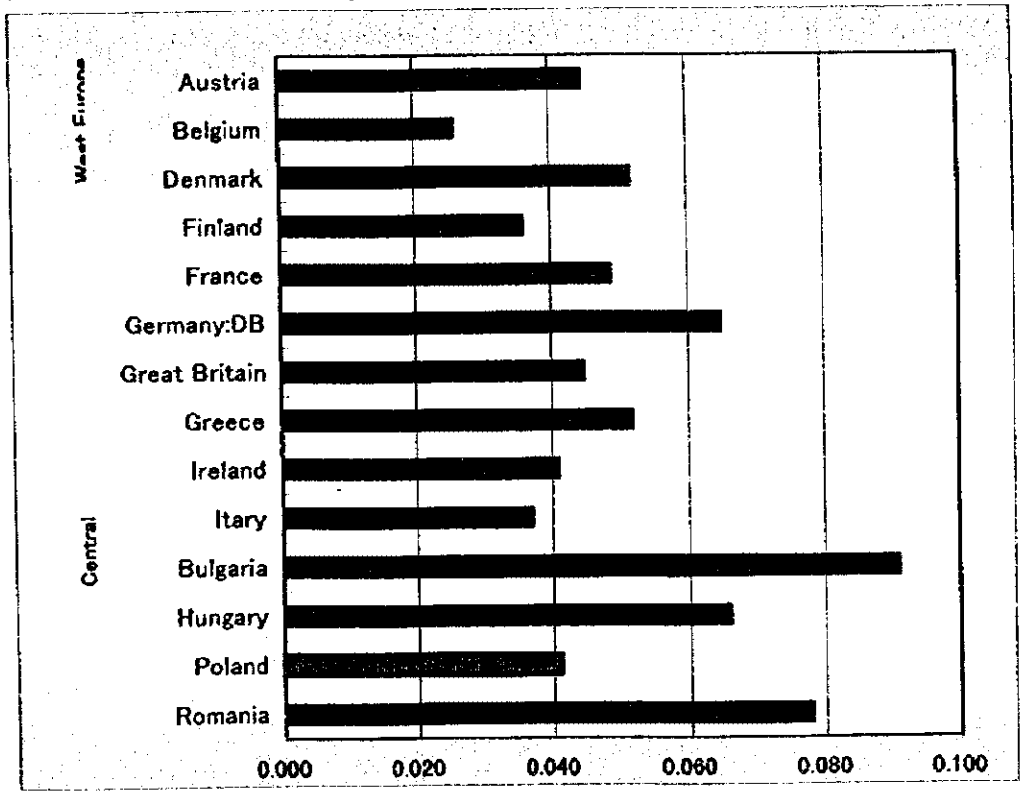


Table 3.3.4 Statistics on Freight Railway Revenue (Fare / t * km)



Source) Railway Business Report 1995

(2) Railway fare comparison with other transport mode

Some fare comparisons, in which the railway passenger fare is contrasted with PKS bus fare (for long distance service), are shown in figure 3.3.6 and 7 . Present Bus fare is also regulated as the Government official price to some extent but its application depends on the operators policy . According to the transport law, a bus operator is required to apply the official price for the bus fare of specific routes if it expects the compensation for the operating revenue loss due to the few demand . The figure 3.3.6 shows the comparison between PKP railway fare and bus fare in case of adapting official price to both . They look almost same level, excluding a range from 40 to 120 km, where the PKP fare shows slightly higher level . Generally any bus operator can fix its own fare of the bus routes except for above mentioned case, in which the operator requests government subsidy . The figure 3.3.7 shows the comparison between PKP fare and bus fare in long range and it is observed that the bus operator sets competitive fare for PKP fare within 250 ~ 300 km range where the bus fare keeps lower level than railway . The average tariff of long distance bus appears to change by route and it is mentioned that the bus tariff structure implies competition with railway . Meanwhile, figure 3.3.8 shows a comparison result of the freight tariff between railway and truck cargo . In this figure each line explains basic tariff by transport means and cargo weight . As far as referring to the figure, it seems that the truck cargo tariff is a little higher than that of railway and the difference amounts to 2 times in average price, however it should be remembered that actual mode choice of freight transport is made not only by its cost but other factors . There are many factors considered to affect the mode choice, for example total transport hours, service quality (less damage through transport) and convenience for loading and unloading . In addition there are many commercial practice to discount freight fare from viewpoints of marketing and it is mentioned that real fare might be quite different from the released price .

Figure 3.3.6 Passenger fare comparison between railway and bus

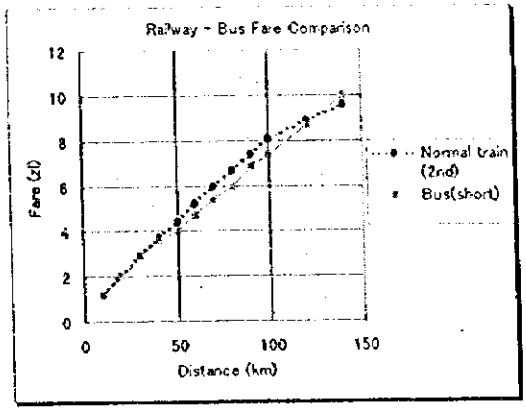
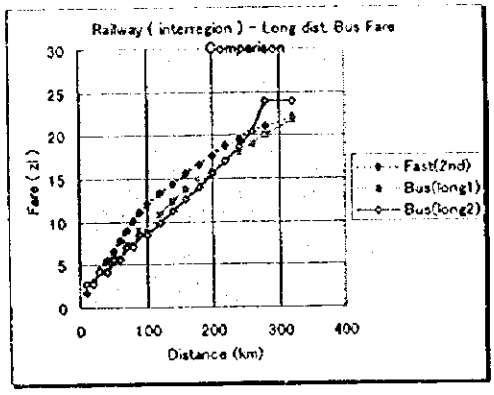
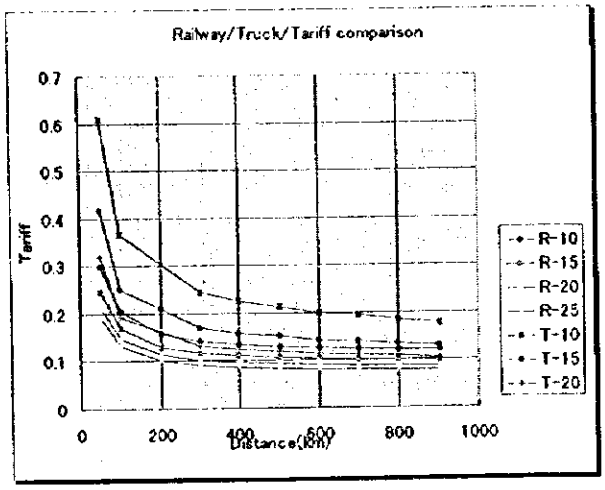


Figure 3.3.7 Passenger fare comparison between railway and long distance bus





(Note) R-n denotes railway freight tariff for (n) ton cargo.
T-n denotes truck freight tariff for (n) ton cargo.

Figure 3.3.8 Freight tariff comparison between railway cargo and truck cargo

(3) Comparison with price index of other goods and services

Table 3.3.7 shows the increase rate of PKP railway fare with other primal price index during last decade . Each number denotes index of the price in respective year to that of previous year . As a whole, it is observed that the price had increased drastically in 1990 and it has been keeping stable increase between 120 ~ 130 thereafter . In this figure highlighted cell shows the highest rate and italic one shows the lowest for convenience . According to that, PKP railway fare seems to maintain moderate increase rather than the price group of heating and electricity, while the passenger fare shows slightly high increase . Accordingly, the PKP railway fare is considered to be almost same increase characteristics as an average price index .

Table 3.3.7 Price increase comparison between railway tariff and other price

Commodity \ Year		1990	1991	1992	1993	1994	1995	1995/ 1990
Railway Tariff	Freight	996.9	*133.1*	*126.0*	123.2	131.9	124.6	339.5
	Passenger	930.3	202.6	170.0	163.0	135.9	127.6	973.5
Industrial production index		722.4	148.1	128.5	131.9	125.2	125.4	394.1
Construction price index		650.0	146.3	118.4	124.6	119.7	121.9	*312.3*
Service industry index		685.8	170.3	143.0	135.3	132.2	127.8	556.7
Consumer Price index	Food price	675.5	144.3	136.0	133.0	132.9	126.8	439.6
	Commodity	691.4	175.8	136.5	136.8	131.4	127.3	549.2
	Passenger car	*534.0*	139.3	134.9	132.5	124.6	117.8	365.5
	Oil	700.5	161.9	139.9	136.5	120.3	*112.5*	418.5
Service	Housing	995.9	207.0	157.2	133.6	127.1	146.2	807.8
	Central heating	1303.0	322.8	322.5	168.4	165.9	131.3	3818.0
	Electricity & gas	1397.0	317.0	194.6	134.2	134.7	126.7	1413.0
	Education	668.2	226.1	150.7	131.9	124.6	124.4	696.6
	Long dist. Bus	896.5	222.0	151.2	175.1	146.4	129.2	1112.0
	Urban transport	820.7	220.9	159.8	148.4	134.0	127.3	893.6
	Postage, telecommunication	793.9	267.8	143.6	*111.6*	*113.8*	115.5	564.1

Note) Figures show increase index to previous year, shadowed one denotes highest in respective year and italic one means lowest .

Source) Statistical yearbook GUS, Statistical yearbook PKP

3.3.3 Fare Elasticity Analysis

Table 3.3.8 shows data on the fare elasticity obtained from several studies, which is conducted to analyze demand characteristics of domestic transport in Poland . In general it is considered that the fare elasticity tends to be small for the transport sector where transport mode choice is restricted, for example urban transport, while pretty high for the inter regional transport where the intense mode competition would be expected . The table also describes that the fare elasticity of long distance transport, which is obtained through the stated preference data by study team, indicates relatively high rate, -1, compared with -0.39 of fare elasticity for general railway transport . In addition it is mentioned that the railway captive users, who have no available car and are assumed to be relatively lower income group, are more price sensitive than other passengers who have a available car but have chosen railway for their travel . This suggests that railway price hike will make some railway users quit their travel and may cause a loss of railway revenue as well, and the railway price increase should be conducted discreetly, taking account of other demand elasticity for the speed and service factor .

The effect of bus fare increase for railway is recognized as a subject of cross elasticity to railway demand . According to the result, bus passengers are more price sensitive than railway passengers because more demand shift will be expected in a case of 10% bus fare increase, comparing with a case of 10% railway fare increase .

Table 3.3.8 Comparison of tariff elasticity among several data source

User	Result		Data
	Mode	Change %	Source
Case : A 10% rise in railway fares			
1st class railway passengers, car available	Railway	-1.70	a)
2nd class railway passengers, car available	Railway	-2.70	a)
All railway passengers, car available	Railway	-2.60	a)
Railway travelers on business, car available	Railway	-1.60	a)
All railway passengers	Railway	-3.90	a)
Bus passengers	Bus	1.80	a)
Car users	Car	2.20	a)
Railway travelers on business / long distance train	Railway	-8.00	b)
Railway travelers on private purpose/ long distance train	Railway	-10.00	b)
Railway travelers / long distance train	Railway	-8.00	b)
Case : A 10% rise in bus fares			
Bus passengers	Bus	-8.60	a)
Car users	Car	2.10	a)
Railway passengers	Railway	2.10	a)

Source: a) Analysis of the economic costs of transport and user charges in land transport, Feb. 1997
b) Stated preference survey by study team, Dec. 1996

3.3.4 Fare Policy

(1) Repeal of fare settlement as an official price

As mentioned before, present fare system reflects the government price policy through the official price introduction to passenger and freight fare although the law (PKP law) specifies PKP could manage its own business by commercial enterprise rule .
According to the EC directive 91/440 that is recognized as a common principle applied to any railway business in EU, which Poland will expect to join in future, it is mentioned that any railway business should be isolated from state control in all aspects of its management, finance and account, and should be managed by same rule as an ordinary commercial business . In addition, public service obligation should be carried out only on the contract basis between the state and the enterprises . Concerning the railway fare, it has to be principle that railway enterprise can lay down its own fare system by itself unless there is possibility to violate the EC regulation 1191/96 .
It is foreseen that railway enterprise takes more initiative to determine its own tariff if the railway business law will be put into effect after the railway operation is separated from the railway infrastructure . Accordingly, it is necessary that railway operators should review their business activity, separate commercial activities from public service obligation and establish business framework, negotiating the public service contract on the transport service requested from the State or the municipality . These trend might result in a buildup of new tariff system which is structured on more business and strategic mind .

(2) Formulation of future fare system

It is desirable to revise PKP fare in accordance with the progress of PKP privatization . As a subject to review the PKP fare system, both of its fare level and its application are focused as follow ;

1) Fare level

It will be required that PKP improve its business performance through both increasing business profit and decreasing cost, aiming at the realization of its privatization . As for the fare policy, fare level rise will become main subject in order to increase transport revenue . As seen before, present PKP fare level remains relatively lower in its amount and increase rate, comparing with the fare level in western countries, that of other transport and the consumers price index, it can be allowed that PKP manage

to change the fare level with taking necessary measures .

① Possibility of fare rise by transport division

Although there is possibility of fare increase for both passenger service and freight service, its availability is different by each division . This is shown as follow ;

Table 3.3.9 Issues on fare change by transport division

Transport division		Issues on fare change
PASSENGER	Inter city transport	Since few fare difference exists between railway and bus and,fare elasticity is expected to be high for both mode, a hasty fare hike results in revenue reduction . However it is allowed if sufficient facilities investment is provided because passengers would accept fare hike with improving transport service .
	Urban transport	In general fare elasticity is low, however exceeding fare increase is not recommended because it will result in reduction of public transport demand and such a situation is not acceptable from urban policy .
FREIGHT	Coal and ore	Reasonable tariff hike is allowed because present fare is kept at lower level from political reason . Regarding the demand decreasing due to fare increase, it is not expected so much because railway holds dominant position for this commodity .
	Others	It is probable that excessive tariff increase makes the freight demand shrink, while the increase is allowed if it does not violate international rule like EC directives .
Fare discount		It is desirable that present discount system, applied to passenger and freight fare system, should be reviewed to be abolished in long term, taking account of its commercial viability even if it is politically decided .

Based on the present railway business performance, it is foreseen that passenger transport business will go into the red while freight business keeps profit when the railway business is separated into sectors with separating railway operation from infrastructure management . Under this situation, it will be favorable that the track access charge is controlled by type of railway operation, that is passenger service and freight service . For this purpose, it is expected that the freight tariff will be increased by phase and the passenger tariff will be increased for inter city service by a small fluctuation, implementing necessary investment to promote demand .

② Fare level revision

According to the SP survey, elasticity of passenger demand was estimated to be -0.8 as a fare elasticity and 1.5 as a time elasticity for inter city train service . This suggests that passenger demand does not drop if time reduction effects more than 5% as saved time even in case of the fare increase of more than 10% . Although it is unknown at present how much time reduction is expected for railway travel through

improvement of PKP network, some scenario, in which average velocity increases from 110 km to 120 km in the IC service between Warsaw and Krakow and time reduction is estimated 8%, could satisfy above level and suggests that the tariff increase is feasible .

By conducting a tariff increase simulation for passenger service, the result was obtained as shown in figure 3.3.5 . This calculation has presumed following condition ;

A Base year for calculation is 1996 .

B Fare increase rate is given as an input .

C Demand is estimated for each fare increase, using a fare elasticity model which was shown in previous section .

D Total passenger revenue is calculated as a product of passenger demand and tariff .

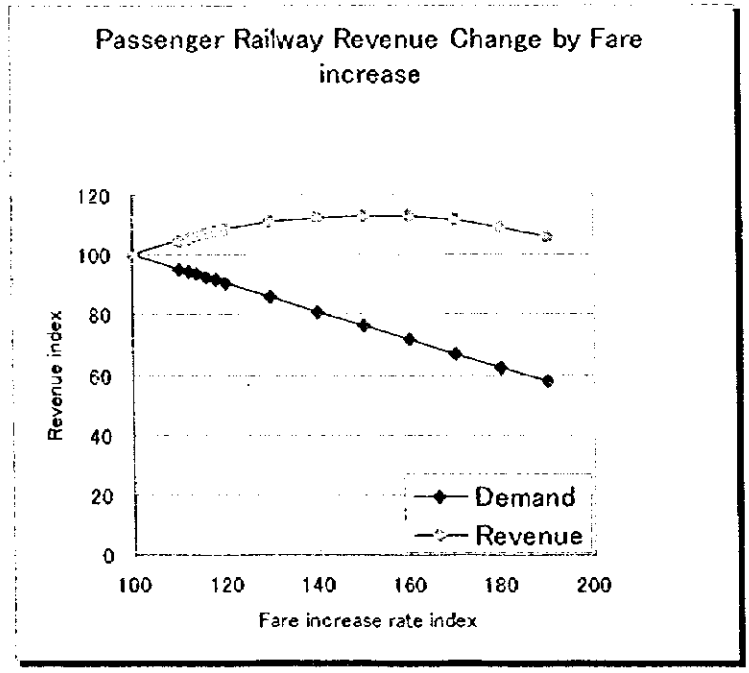


Figure 3.3.5 Change of passenger railway revenue by passenger fare increase

This figure suggests that total passenger revenue is increasing until the level of 50% up in passenger railway tariff even if demand reduction is taken into account due to fare increase, and passenger fare can be increased up to 50% for the present tariff level . Regarding the freight transport, it is considered that the freight tariff for coal transport, to which official price is applied, could be revised up to the same tariff level as other freight . The possibility of losing transport share to the truck is considered to be low for the tariff increase, because PKP freight service holds predominant position in freight transport sector, especially for the bulk cargo transport like coal .

However it is recommended that tariff revise is done discreetly because many newcomers are expected as a competitor with PKP freight business when the open access rule will become effect with enforcement of the railway business law in near future .

2) Fare system after separating railway operation from infrastructure

It is the basic principle for railway business that the rail operation is separated from the rail infrastructure management and any railway operator could get access to same railway infra if they satisfy the technical and economic criteria as a railway operator . This system implies that each railway operator pays infrastructure charge to infra management body in case of rail access, and such cost is transferred to railway users through the railway fare system in the end . Accordingly, the access charge system has affected the scale and profitability of railway market because the access charge is supposed to be overall cost for the railway operators, however it could make an operator's cost structure worse if the access charge is allocated more than the bearable level of operator . It is very important for railway business development whether the access charge is controlled or not . If the infra management regulates the access charge at lower level, for example marginal pricing principle, it is expected that more railway operators will enter market, more competition takes place and transport service will be improved substantially .

These consideration suggests that the infra management body is responsible for not only railway operation control but also railway market development .

After the separation of railway operation, the fare level will be fixed independently by railway operator based on own cost revenue balance . Meanwhile if the market principle will act, the fare becomes lower, reflecting market competition on equal footing among operators, and that results in benefit for railway users .

3.4 PASSENGER TRANSPORT

3.4.1 Measures to Improve Passenger Transport

In Poland, cities with populations of 500 thousand to one million scatter at intervals of 100 to 300 kilometers to compose an attractive market for railways with respect to competitiveness. As the country is shifting to a market economy, economic ties with west European countries will further be strengthened to expedite mutual exchanges in between. Under the circumstances, Polish State Railways (PKP) is required to study the profitability

of passenger transport business based on available data, predict future trends and establish policies on the privatization now under discussion.
As passenger transport business is now in deficit, PKP is receiving subsidies from the government. To decrease the subsidies, PKP must establish self-subsistent management in potentially profitable businesses, one of which seems to be the inter-city transport centering on the operation of high-class trains. A typical non-profitable business, on the other hand, is the operation of ordinary trains. In this business field, there are large differences in the traffic volumes and revenue between businesses in urban and local areas, as separately analyzed below.

Major subjects categorized by transport function are as follows.

(1) In inter-city transport, railways are advantageous against road and air transport in terms of punctuality, rapidity and the capacity of mass transport, as major cities are located at intervals of about 300km. Participation of Poland in the European Union (EU) in the near future will expedite flow of people to and from other countries in Europe.
However, PKP should not be optimistic, as its market share will be compromised by automobiles after more highways have been constructed in the future. Therefore, PKP is required to make efforts to improve passenger services, satisfy passenger needs and attract more passengers to rail transport.

(2) In urban areas jammed with automobiles, such as Warsaw, Katowice, Gdynia and Poznan areas, chronic traffic congestion and shortage of parking lots are everyday affairs, where railways are superior to other modes of transport for their punctuality and the capacity of mass transport. As seen in the number of season ticket passengers which has recently turned to increase, concentration of population into large cities will be accelerated in the future.
Under the circumstances, PKP will be able to stop decreases in the traffic volume and maintain its current level, if PKP improves passenger services by introducing new EMUs or renew existing cars for commuter transport.

(3) In local areas, however, populations in catchment areas will further decrease as people are concentrating into cities. Automobiles are prevailing to every corner of the country. As a result, the traffic volume on rail transport will substantially decrease in the future.
To aim at privatization, it is essential for PKP to distinguish profitable businesses from non-profitable ones and quantitatively assess their competitiveness, in order to vitalize the passenger transport business.

It is important to eliminate inter-division subsidies by adopting policies to encourage self-subsistence of each division in the future. PKP must judge whether it maintain non-profitable businesses while obtaining subsidies from the government or local autonomous bodies.

3.4.2 Profitability of Passenger Transport

(1) Division-wise Comparison of Traffic Volume and Revenue.

1) Division-wise Comparison

Table 3.4.1 compares volumes of passenger transport and revenue from urban, inter-city and local lines in 1995.

① Inter-city transport accounts for 15% of the number of passengers, 62% of passenger-kilometers and 52% of revenue. Although the number of passengers is smaller, inter-city passengers travel for longer distances than those in other transport services. This makes the per capita revenue and share larger than those in other services.

② Urban transport shares 56% of the number of passengers, 24% of passenger-kilometers and 32 % of revenue. Although the number of passengers, mostly commuters, is larger, the share in revenue is smaller, as passengers travel for shorter distances mostly with discounted season tickets.

③ Local transport has only a small share in revenue, though its shares in the number of passengers and passenger-kilometer are so-so comparable with those of inter-city and urban transport. Therefore, inefficient local lines must be rationalized to cut expenditure.

The total of the shares of inter-city and urban transport services amounts to 84% of the revenue of PKP. This suggests that PKP is required to promote marketing on a preferential basis in these business fields.

Table 3.4.1 Comparison between transport divisions

(unit: million persons, 100 million passenger-km, million PLN)

	No. of passengers		Passenger-km		Revenue	
Intercity transport	69	(15)	165	(62)	529	(52)
Urban area transport	263	(56)	64	(24)	327	(32)
Local Line services	133	(29)	37	(14)	163	(16)
Total	465	(100)	266	(100)	1019	(100)

Source: Statistics on passenger transport of PKP

2) Comparison per Train

Table 3.4.2 compares data per train in inter-city, urban and local transport businesses

① IC, EC and EX trains running between cities are used by 226 passengers per train on an average to record a load factor (passenger occupancy ratio) of 59%. Scheduled speeds are higher and operating distances are longer than those of trains of other categories. Express trains are used by 331 passengers per train on an average with scheduled speeds and operating distances ranking next to those of IC and EC trains.

② The load factor of urban transport trains is 60% when averaged over a day. During rush hours in the morning, however, it may reach a peak of 120 to 130% of the seat capacity.

③ Scheduled speeds are extremely low on non-electrified local lines.

As described above, inter-city trains are patronized by a large number of passengers and run at high scheduled speeds for long distances per day, when compared with trains of other categories. This is advantageous not only to secure revenue but also to improve the efficiency of rolling stock rotation.

Table 3.4.2 Comparison of data per train (in 1995)

	Intercity transport			Local line services		Urban area transport
	IC EC EX	Express trains				
	(EL)	(EL)	(DL)	(EL)	(DL)	(EC)
Train running-km (km/day)	381	190	240	60	60	60
Schedules speed (km/h)	88	64	52	48	40	45
No. of seals	384	736		380		375
No. of passengers	226	331		224		226
Load factor (%)	59	45		59		60

Source: Statistics on passenger transport of PKP

(2) Profitability

1) Innter-city Transport

When the revenue from IC, EX, express and international trains in 1995 is summed up, inter-city transport of PKP earned 529 million PLN at the expense of 987 million PLN to record a deficit of 458 million PLN.

Although breakdowns of infrastructure and train operation costs are not available, the revenue and expenditure of train operation are summarized as shown in Table 3.4.1, when they are analyzed by applying a value of 68% as the ratio of train operation cost to expenditure. As seen in the Table, the revenue is 529 million PLN, while the expenditure is 671 million PLN, to show a loss of 142 million PLN.

Table 3.4.3 Profitability of inter-city transport

(unit: million PLN)

	Revenue (A)	Cost (B)	Train operation cost (C)	(A)-(B)	(A)-(C)
International transport	94	212	144	- 118	- 50
IC. EX	132	164	112	- 32	20
Express trains	303	611	415	- 308	- 112
Total	529	987	671	- 458	- 142

(Note) Calculation based on the statistics on passenger transport of PKP

IE and EX trains gained 132 million PLN and spent 164 million PLN to lose 32 million PLN. When the train operation cost alone is counted as expenditure, however, the balance turns to a surplus of 20 million PLN.

International and express trains are in the red even when the train operation cost alone is taken into account. This is because international trains include those running on short sections across the boundaries with neighboring countries, and fares are set low for express trains, though these trains are used by a large number of passengers.

Inter-city transport as a whole is losing money when revenue and train operation costs are compared. As the inter-city business doesn't suit official subsidies, PKP is required to take measures to balance revenue and expenditure including a minimum level of rental charges for rolling stock. We will estimate investment costs for speed-up and renewal of rolling stock for the purpose of improving passenger services and investigate to what extent PKP is able to bear investment burdens. The inter-city transport business will encounter intensified competition in the future as automobiles are increasing and highway networks are being improved. Therefore, PKP must solidify its basis of management in order to survive competition with other transport facilities.

2) Urban Transport

The urban transport division registered revenue of 327 million PLN and expenditure of 1,047 million PLN, with a loss of 720 million PLN or 385 million PLN when train operation costs alone are counted.

Table 3.4.4 Profitability of urban transport

(unit: million PLN)

	Revenue (A)	Cost (B)	Train operation cost (C)	(A)-(B)	(A)-(C)
Urban area transport	327	1,047	712	- 720	- 385

(Note) Calculation based on the statistics on passenger transport of PKP

The transport volumes are enormous in urban zones of Warsaw, Gdansk, Katowice and Poznan. As more and more people are flowing into these cities, PKP will be able to improve the balance between revenue and expenditure in the urban transport business, if it makes efforts to rationalize its management and improve passenger services to attract more passengers. As the absolute amount of deficit is large, however, it seems difficult to turn the balance black.

Given the social demerits of automobiles when people solely rely on them for transport in cities, however, railways have a vital role in urban transport for their capacity of mass transport, punctuality, rapidity and environment-friendly features. In view of such social needs for railways, therefore, official subsidies will be inevitable to some extent on the condition that PKP perform transport contracted with autonomous bodies in urban areas.

3) Local Transport

The local line transport business registered revenue of 163 million PLN and expenditure of 958 million PLN, with a deficit of 795 million PLN or 488 million PLN when train operation costs alone are taken as expenditure. In this business division, the transport volume is anticipated to sharply drop in the future.

Table 3.4.5 Profitability of local lines

(unit: million PLN)

	Revenue (A)	Cost (B)	Train operation cost (C)	(A)-(B)	(A)-(C)
Local line services	163	958	651	- 795	- 488

(Note) Calculation based on the statistics on passenger transport of PKP

It seems impossible to maintain the management of local lines even though PKP makes efforts for rationalization, unless subsidies are provided. PKP will not be able to bear even Rail Access charges for ever. PKP cannot help but withdraw from local areas where transport can be substituted by automobiles. In consideration of people who don't have means of transport other than trains, however, PKP must determine criteria for withdrawal or continued presence.

(3) Transport Volume and Load Factor Predicted for 2005

1) Estimates of Number of Passengers, Passenger-kilometers, Train-kilometers and Car-kilometers

A demand forecast of the volume of passenger transport gives the following number of passengers and passenger-kilometers in 2005

Table 3.4.6 Present and future number of passengers and passenger-kilometers

	Number of passengers (1,000)			Passenger-kilometer (million)		
	1995(a)	3005(b)	(b)/(a)	1995(a)	2005(b)	(b)/(a)
Inter-city transport	69,315	83,000	120	16,474	19,620	119
Urban transport	262,969	263,000	100	6,425	6,426	100
Local transport	132,775	81,000	61	3,723	2,396	64
Total	465,059	427,000	92	26,622	28,442	107

Source: PKP

Based on these transport demands, train-kilometers and car-kilometers are assumed as follows.

As passenger-kilometers are assumed to increase by 19% in inter-city transport, we assume that train-kilometers will increase by 10% on an average, or approximately a half the increase in passenger-kilometers. While taking into consideration the excess transport capacity of express trains, we assume that trains are composed of 7.3 cars. As a result, car-kilometers remain at the present level as a whole.

In urban transport, passenger-kilometers are assumed to remain unchanged. Although the number of passengers is almost unchanged as well, we recommend to operate trains 5% more and decrease the number of cars in a train composition to 4.8. As a result, total car-kilometers will decrease by 10%.

On local lines, the number of passengers and passenger-kilometers will sharply drop. Some lines will be closed. Therefore, we assume a drop of 36% in train-kilometers. By taking into account the effects of introducing rail buses, we assume to run trains averagedly composed of 2.5 cars. This reduced car-kilometers by 64%.

Table 3.4.7 Present and future train-kilometers and car-kilometers

(Million kilometers or cars)

	1995			2005		
	Train-kilometer	Number of cars per train	Car-kilometer	Train-kilometer	Number of cars per train	Car-kilometer
Inter-city transport	68	8.0	544	75(110)	7.3	548(101)
Urban transport	58	5.6	325	61(105)	4.8	293 (90)
Local transport	45	4.5	203	29 (64)	2.5	73 (36)
Total	171	6.3	1,072	165 (96)	5.5	914 (85)

Source: PKP

(Note) ( ) indicates an index when the figure of 1995 is taken as 100.

2) Division-wise Present and Future Capacity and Volume of Transport and Load Factor*

We assume the capacity and the volume of transport of each division in 2005 as follows.

For inter-city transport (EC, IC and EX trains), we assume that the number of cars per train is unchanged and the volume of transport increases by 20% to keep pace with the increase in passenger-kilometers. To eliminate the current excess capacity of inter-region express trains, we cut the capacity by 18%, and assume that the volume of transport increases at the same rate as those of IC and EC trains.

For urban transport, we assume that the capacity of transport decreases by 15%, by applying the decreasing rate of the number of cars per train, and that the volume of transport maintains the present level on the assumption that passenger-kilometers remain unchanged.

For local transport, we assume that the capacity of transport decreases in proportion to the decrease in the number of cars per train. We set the volume of transport to reflect the decrease in passenger-kilometers.

Based on the above assumptions on passenger-kilometers, train-kilometers and car-kilometers, the load factors of trains in different divisions are calculated to be averagedly 65 to 70% as shown below to suggest an improvement of the efficiency of transport.

High-class inter-city trains (EC, IC and EX trains) improve the load factor by 11 points to 70%; inter-region express trains by 21 points to 66%; trains for urban transport by 10 points to 70%; and trains for local transport by 9 points to 68%.

Table 3.4.8 Present and future capacity and volume of transport and load factor

(Per train)

		Capacity of transport (passengers)	Volume of transport (passengers)	Load factor(%)	Remarks
Inter-city transport (EC, IC, EX)	1995	384	226	59	
	2005	384	271	70	
Inter-city transport (inter-regional express trains)	1995	736	331	45	
	2005	604	397	66	
Urban transport	1995	375	226	60	
	2005	322	226	70	
Local transport	1995	380	224	59	
	2005	211	143	68	

Source: PKP

3.4.3 Improvement of Management Organization

To privatize the passenger transport business by keeping abreast of the movement toward a market economy of the country, it is important to discuss two possibilities to divide the organization of PKP. One is to divide the railway network region-wise (whether to cover the entire network with a single entity or by a plurality of entities. The other is to divide it function-wise (with respect to inter-city, urban and other transport functions).

(1) Possibility to Divide the Railway Network

1) Possibility of Function-wise Division

To improve the management of passenger transport business, which is currently at a serious financial position, PKP is required to clarify profitable and non-profitable divisions first, and then privatize potentially profitable divisions by establishing self-subsistent private companies that will be able to survive in a market economy with reduced amounts of subsidy from the government.

To do this, PKP must separate profitable and non-profitable divisions in passenger transport business. EC, IC, EX, express and other high-class trains connect twelve major cities (Warsaw, Gdansk, Gdynia, Lublin, Krakow, Katowice, Wroclaw, Poznan, Szczecin, Bialystok, Bydgoszcz and Lods) at high speeds. This is the only one profitable business field in the future, on the condition that PKP improves passenger services, innovates car accommodations and raises train speeds.

Accommodation trains cover almost the entire railway network in the country. However, there are two conspicuously different fields in the accommodation train service. One is the transport in four urban areas, Warsaw, Katowice, Gdynia and

Poznan. The other is local line transport in depopulated areas, which is far behind the former in terms of the transport volume to require specific measures for improvement of management. Therefore, it is necessary to separate urban transport and local line transport divisions according to their different functions.

From the above, we conclude that the passenger transport business must be separated function-wise, or into inter-city, urban and local line transport divisions.

2) Possibility of Region-wise Division

To survive the severe competition with airlines and road transport facilities in inter-city transport, passenger flows should be coped with concentratedly as far as possible in providing passenger services. Inter-city trains are now connecting major cities by taking advantage of the exiting nationwide railway network to cover all passenger flows across the country. Therefore, it is desirable that inter-city transport be managed all over the country by an integrated entity.

Urban zones normally spread to a radius of 40 to 50 kilometers. In urban transport business, therefore, it is possible to provide passenger services to satisfy conditions specific to each of these urban zones.

In local line transport business, systems of train operation and passenger flows scatter in different areas throughout the country. It is desirable, therefore, to control passenger transport separately in different regions with a city to represent each region as a basis.

(2) Possibility of Privatization

The inter-city transport division is the most promising among three transport divisions and potentially profitable in the future, if appropriate measures are taken to increase revenue, cut expenditure and minimize rolling stock rental charges. Therefore, we discuss the possibility of privatization of this division.

When the inter-city transport is handled by an integrated entity, it will be possible to provide chances of travel and passenger services to satisfy conditions specific to each region by a streamlined organization of the entity.

In urban transport business, per capita revenue is small while the large volume of transport requires prohibitively large costs. This makes the business non-profitable. To maintain the business, therefore, subsidies must inevitably be introduced.

In local line transport business, both transport volumes and revenue are meagre. Even though light-density lines have been abolished as planned, privatization of other lines is

impossible, unless large amounts of subsidy are provided.

(3) Improvement of Management Organization

From the above discussions, it is desirable to manage and privatize passenger transport divisions as follows, in order to solidify the basis of management, successfully compete with automobiles, airplanes and other transport facilities, and maintain a sound management structure.

Inter-city transport business (with a total length of about 4,000 kilometers) will be viable in the future, if passenger services are improved to compete with automobiles and airplanes by utilizing PKP's nationwide railway network.
It must be targeted to perform inter-city transport by a single entity, and establish a self-subsistent management system without obtaining subsidies from the government.

For urban transport (with a total length of about 1,100 kilometers), it is desirable to determine levels of train operation and other passenger services through negotiations between the railway company and autonomous body in each region. Funds for maintaining the business must be determined through consultations between relevant cities and the government.
For the time being, a plan must be prepared for each of the four urban zones (each spreading to a radius of about 270 kilometers) based on the current PKP plan, where four urban zones mean those of Warsaw, Katowice, Gdansk and Poznan. For local line transport (nither total length of about 11,000 kilometers), it must be determined whether local lines with few passengers be abolished or maintained through negotiations between railway companies and autonomous bodies. For those to be maintained, it is desirable to contract transport services between railway companies and autonomous bodies. Funds for the purpose must be determined through consultations between relevant autonomous bodies and the government.
For the time being, plans for rationalization of local lines must be promoted for 19 regions now under discussion by PKP. Central cities in these 19 regions are Szczecin, Koszalin, Gdansk, Olsztyn, Bialystok, Bydgoszcz, Poznan, Lods, Radom, Lublin, Rzeszow, Krakow, Czestochowa, Bielsklo Biala, Gliwice, Opole, Wroclaw, Jelenia Gora and Zielona Gora.

We will discuss whether motive power unit divisions be separated from or integrated into passenger transport divisions based on the following concept.
In passenger transport business, it is important to provide comfortable rolling stock

facilities to satisfy passenger needs. This means that rolling stock is an extremely important commodity for passenger transport divisions. To discuss the future of passenger railway companies, therefore, it is desirable to integrate rolling stock divisions related to passenger transport into passenger transport divisions, in order to construct a basis of management to survive competition and clarify the balance between revenue and expenditure.

In the case of Japanese Railway Companies (JR companies), train operation divisions and rolling stock divisions are integrated into a railway business division to perform control and planning of rolling stock. Since the start of JR companies, these rolling stock divisions have introduced a number of new cars and raised train speeds, thereby effectively contributing to increases in revenue and passengers.

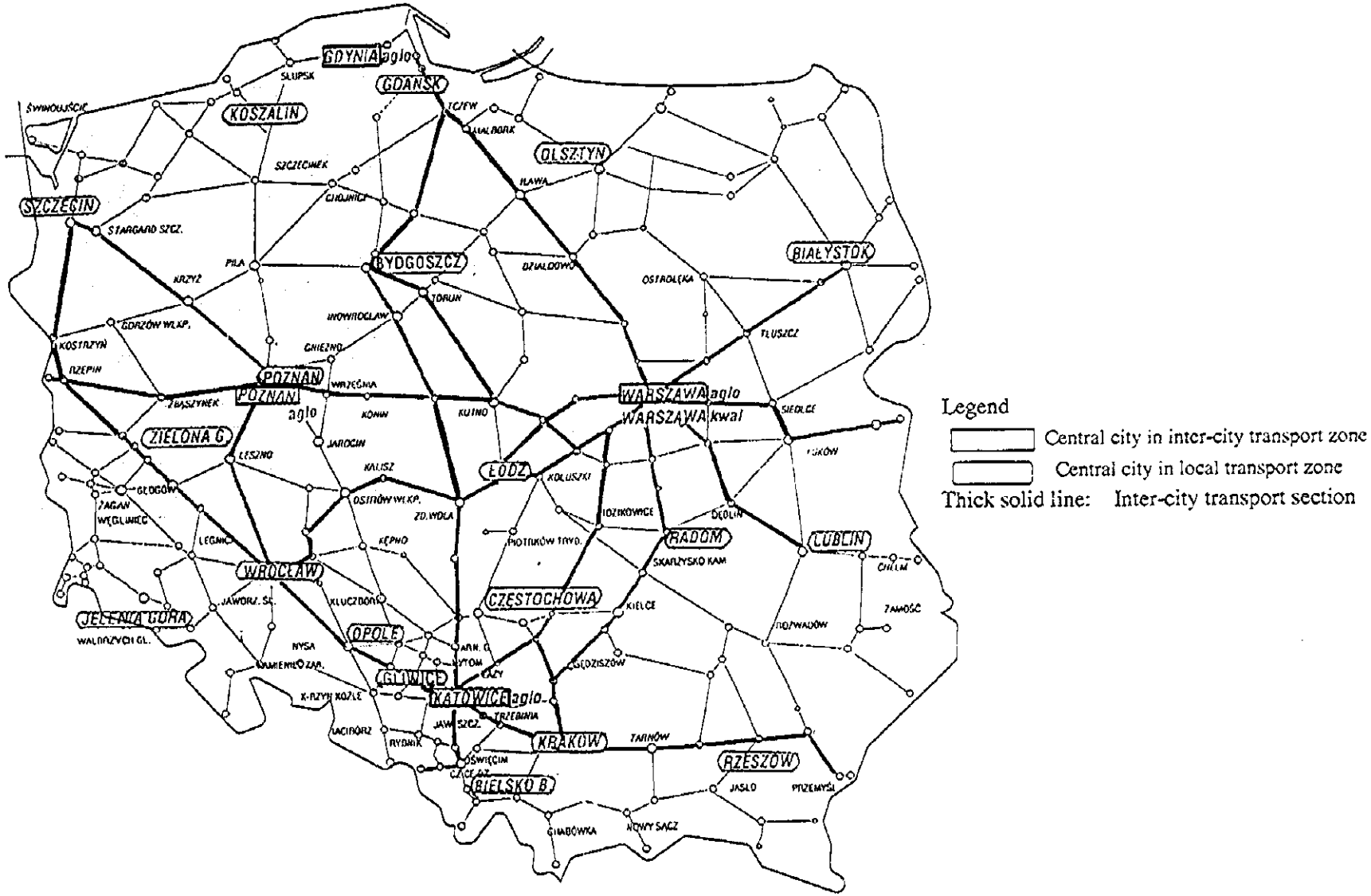
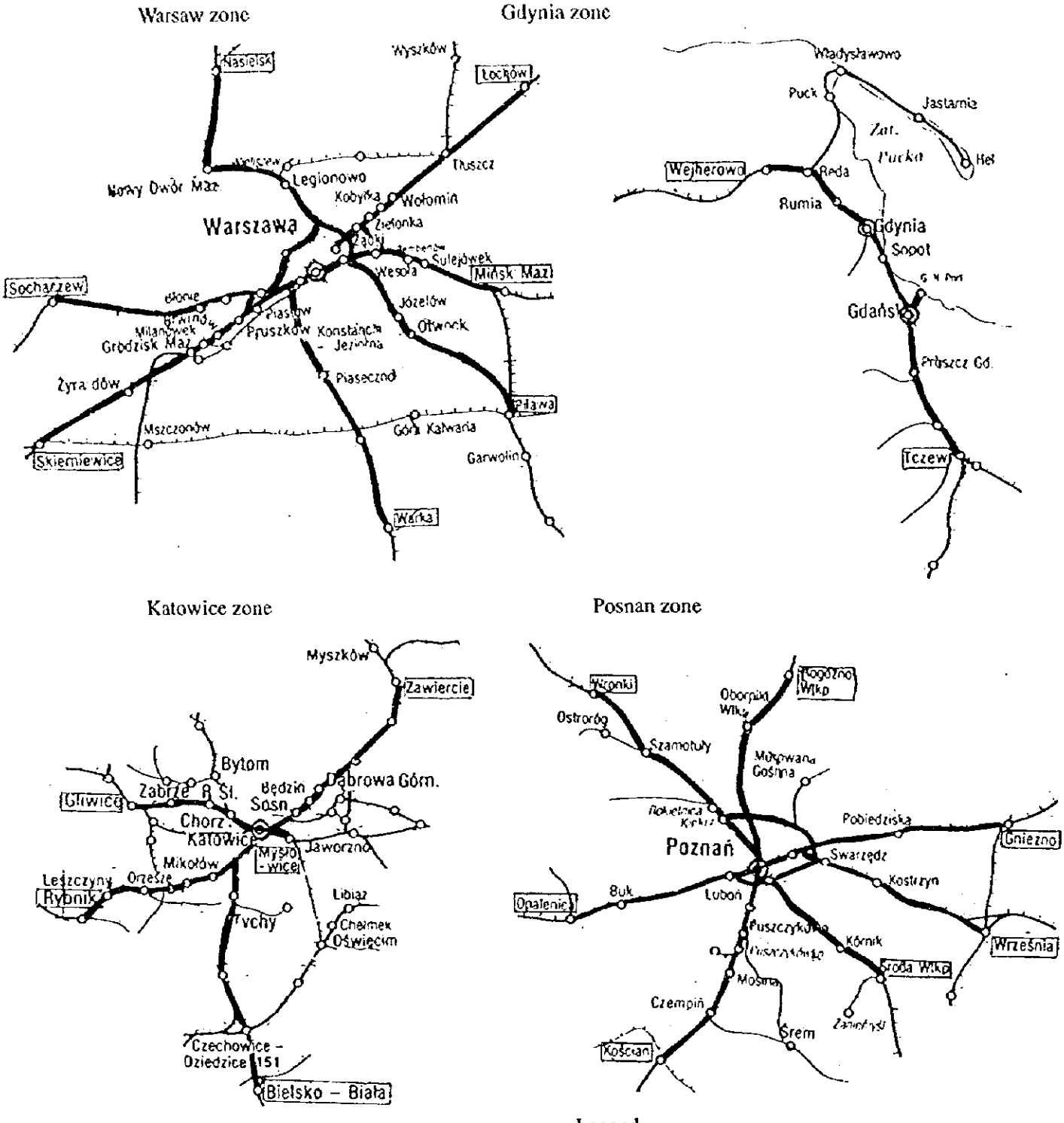


Fig. 3.4.1 Central cities in inter-city transport sections, four urban transport zones and 19 local transport zones.



Legend

Thick solid line: Urban transport section

Fig. 3.4.2 Urban transport sections