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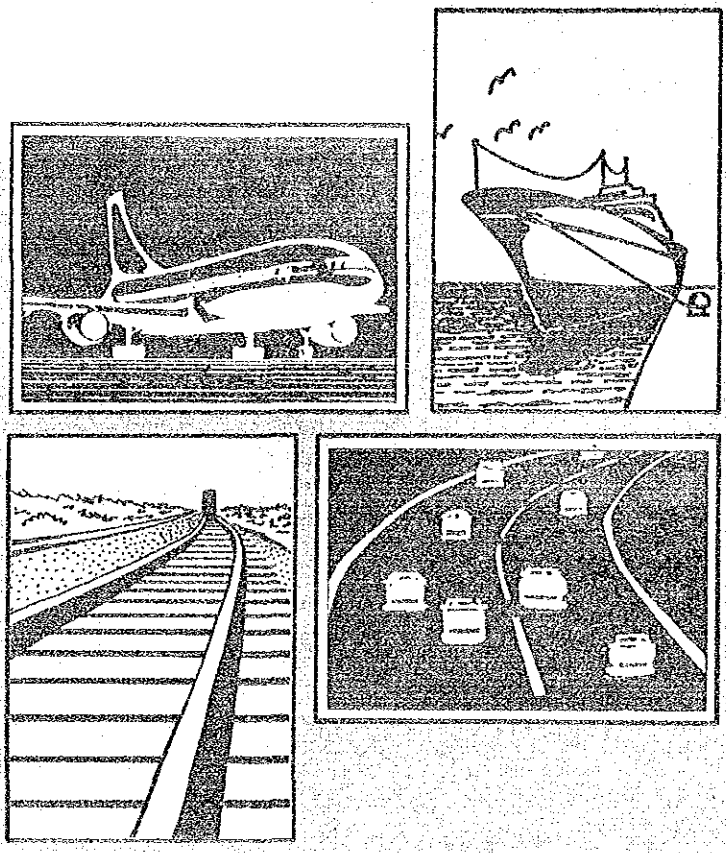
THE REPUBLIC OF POLAND
MINISTRY OF TRANSPORT AND MARITIME ECONOMY

STUDY ON THE NATIONAL TRANSPORT PLAN IN THE REPUBLIC OF POLAND

FINAL REPORT

VOLUME 2
NATIONAL TRANSPORT PLAN



DECEMBER 1992

JAPAN INTERNATIONAL COOPERATION AGENCY

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The following foreign exchange rates are applied in the study:

1989	US$1.00 =	1,446.31 Zloty
1990		9,500
1991		11,100
1992		13,500 (as of June 1992)

THE REPUBLIC OF POLAND
MINISTRY OF TRANSPORT AND MARITIME ECONOMY

THE STUDY
ON
THE NATIONAL TRANSPORT PLAN
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VOLUME 2

THE NATIONAL TRANSPORT PLAN (Main Text)

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PREFACE

In response to a request from the Government of the Republic of Poland, the Government of Japan decided to conduct a master plan study on the National Transport Plan and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Poland a study team headed by Mr. MINORU SHIBUYA, Executive Vice President of Pacific Consultants International, four times between May 1991 and October 1992.

The team held discussions with the officials concerned of the Government of Poland, and conducted field surveys at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

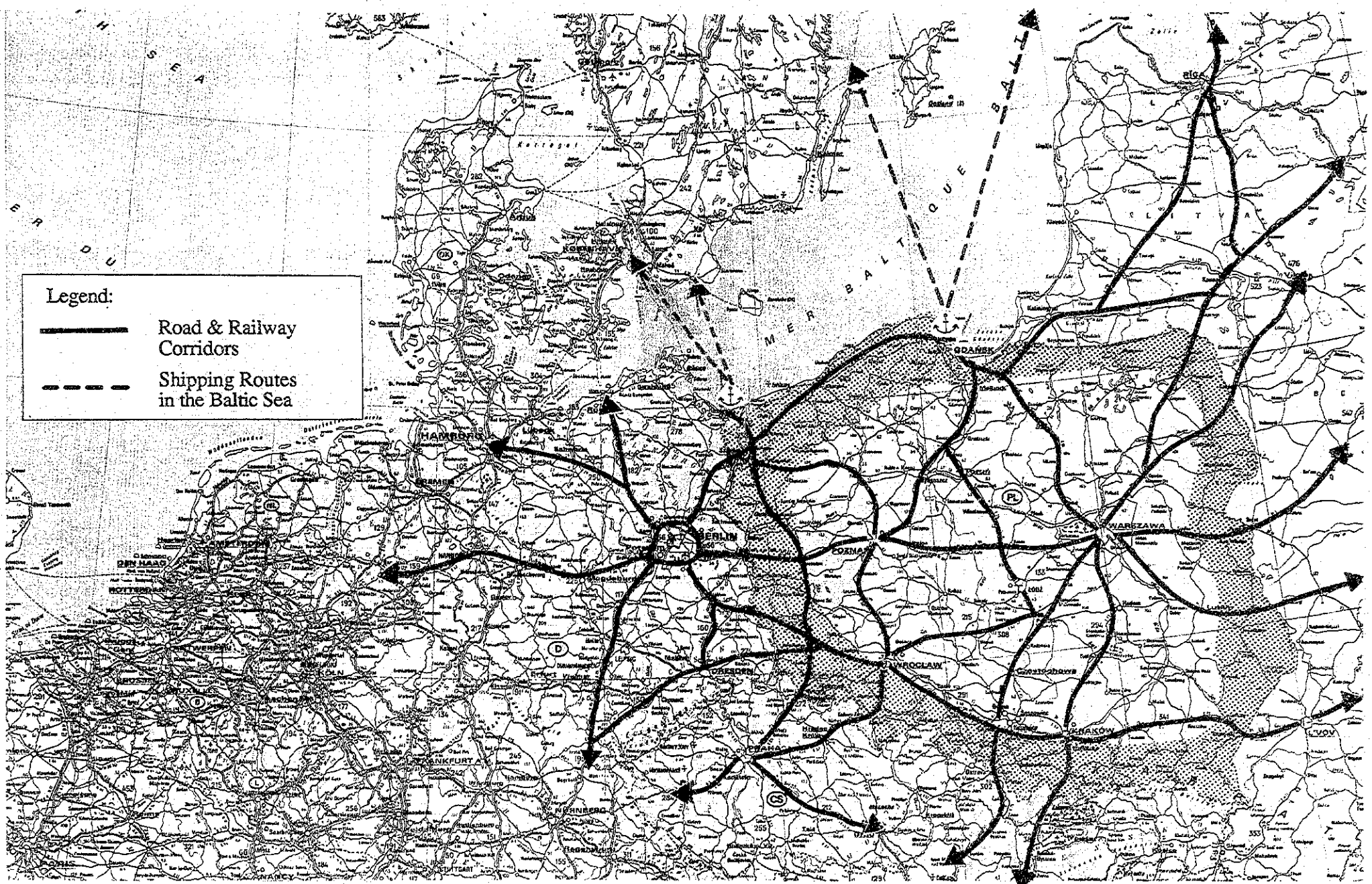
I hope that this report will contribute to the promotion of the projects and programs and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Poland for their close cooperation extended to the team.

December 1992

Kensuke Yanagiya

Kensuke Yanagiya
President
Japan International Cooperation Agency



INTERNATIONAL TRANSPORTATION CORRIDORS CROSSING POLAND

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List of Important Abbreviations

AADT	Annual Average Daily Traffic
ATC	Air Traffic Control
ATS	Air Traffic Services
BPRSD	The Office for Planning of Road Network Development [Biuro Planowania Rozwoju Sieci Drogowej]
CIQ	Customs, Inspection, and Quarantine
CIS	Commonwealth of Independent States
CMEA	Council for Mutual Economic Assistance
CMK	Central Trunk Line [Centralna Magistrala Kolejowa]
CNTK	Center for Railway Technology Research [Centrum Naukowo-Techniczne Kolejnictwa]
CTC	Centralized Traffic Control
DODP	Regional Board of Public Roads
EAPT	Uniform Air Passenger Tariff
EC	European Community
ECAC	European Civil Aviation Conference
EFTA	European Free Trade Aviation
EIB	European Investment Bank
ETP	Economic Transformation Program
FDI	Foreign Direct Investment
GDDP	General Directorate of Public Roads [Generalna Dyrekcja Drog Publicznych]
GDP	Gross Domestic Products
GICA	General Inspectorate of Civil Aviation
GILC	General Inspectorate of Civil Aviation [Glowny Inspektorat Lotnictwa Cywilnego]
GUS	Central Statistical Office [Glowny Urzad Statystyczny]
ICAO	International Civil Aviation Organization
JSC	Joint Stock Company
KERM	Economic Committee of the Council of Ministers
LOT	Polish Airlines
MTME	Ministry of Transport and Maritime Economy
NMP	National Material Products

OBET	Research Center for Transport Economy [Osrodek Badawczy Ekonomiki Transportu]
PATA	Polish Air Traffic Agency
PBSC	Polish Baltic Shipping Company
PCAB	Polish Civil Aviation Bureau
PKP	Polish State Railway [Polenskie Koleje Panstwowe]
PKS	Transport Proper Enterprise [Panstwowej Komunikacji Samochodowej]
PMS	Pavement Management System
POL	Polish Ocean Lines
PPL	Polish Airports State Enterprises
PSC	Polish Steamship Company
SOEs	State Owned Enterprises
TEM	Trans European Motorway
VAT	Value Added Tax

CHAPTER 1 INTRODUCTION

CHAPTER 1 INTRODUCTION

1.1 Objectives of the Study

The overall objectives of the study are defined by the Scope of Work agreed upon in November 1990 between the Ministry of Transport and Maritime Economy (MTME) and the Japan International Cooperation Agency (JICA):

1) Prepare a Master Plan for the National Transport Plan which will effectively encourage the economic restructuring toward free market orientation and the integration of the Polish transport system into European and world systems from long term viewpoints.

2) Propose Priority Implementation Projects and Programs in the short and medium terms based on the above Master Plan, bearing in mind the importance of efficient and effective management and operation in the transport sector to support the economic structural transition in Poland.

Technical transfer during the course of the study forms another objective of the study. It can be construed as transfer of "know how" which would help facilitate the transformation of the transport sector from the centrally planned system to a market economy as well as help improve the efficiency of the sector based on the experience of the western world including Japan.

The Polish Steering Committee, headed by Mr. T. Kulikowski (MTME), and the Japanese Advisory Committee, headed by Prof. H. Nakamura (The University of Tokyo), guided the general directions of the study, under which the JICA Study Team and its Polish counterpart groups worked to fulfill the above objectives. The study results could form a base for the "Transport Polish Paper" which the MTME will prepare in the future on a revolving basis.

1.2 Implementation of the Study

The study is divided into four phases as shown in Fig. 1.2.1:

(1) The First Phase (May - September 1991):

Analyses of the present situation
"Progress Report" submitted in October 1991

(2) The Second Phase (October - December 1991):

Analysis of problems and formulation of basic strategies

(3) The Third Phase (January - March 1992):

Preparation of the national transport plan
"Interim Report" submitted in February 1992

(4) The Fourth Phase (April - October 1992):

Further study on projects and programs
"Draft Final Report" submitted in October 1992

(5) The Last Phase (November - December 1992)

Finalization of the study
"Final Report" submitted in December 1992

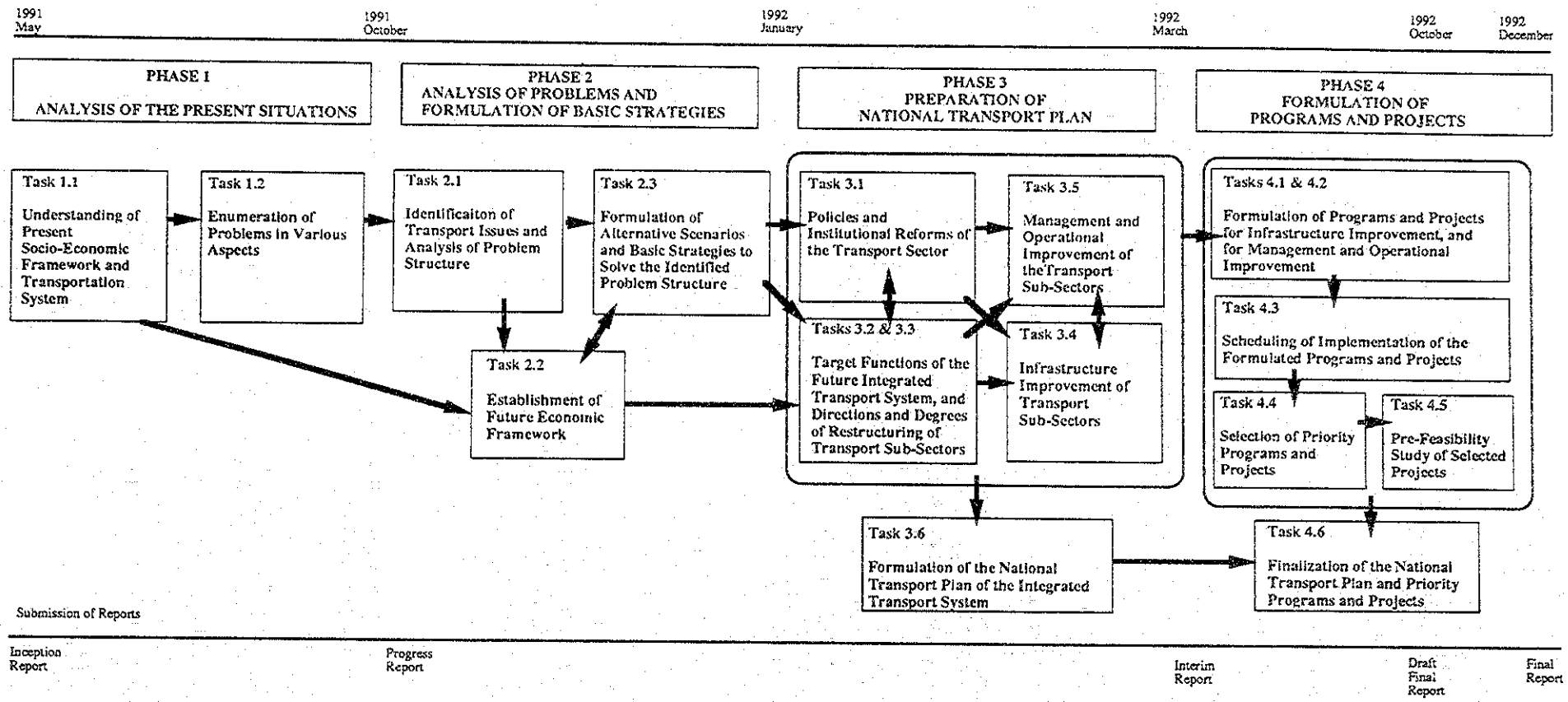

Fig. 1.2.1 General Flow of the Study

The Final Report comprises four volumes:

Volume 1	:	Policy Guidelines for the Transport Sector
Volume 2	:	The National Transport Plan (Main Text)
Volume 3	:	Present Situations
Volume 4	:	Projects and Programs

1.3 Participants of the Study

Participants of the study are: (1) Polish members of the Steering Committee; (2) Japanese Advisory Committee members; (3) JICA Study Team; and (4) Polish Counterparts to the JICA Study Team.

(1) POLISH MEMBERS OF THE STEERING COMMITTEE

Chairman:

Mr. T. Kulikowski	MTiGM

Members:

Mr. Z. Dereszkiewicz	MTiGM
Mr. B. Grzegorzewski	MTiGM
Mr. T. Kulasek	MTiGM
Mr. G. Ociesa	MTiGM
Mr. Z. Kowalczyk	MTiGM
Mr. A. Kalinkowski	MTiGM
Mr. A. Berezowski	GILC
Mr. A. Koziel	GDDP
Mr. T. Kozak	DG PKP
Mr. J. Perenc	OBET
Mr. W. Kosieradzki	CNTK
Mr. H. Ruder	BPRSD
Prof. dr hab. Jan Burnewicz	Universytet Gdanski (Expert)

(2) JAPANESE ADVISORY COMMITTEE MEMBERS

Chairman:

Prof. H. Nakamura	Tokyo University

Member:

Mr. H. Kono	Ministry of Transport, Japan
Mr. H. Sasajima	Ministry of Transport, Japan
Mr. K. Takada	Ministry of Construction, Japan
Mr. M. Takahashi	JICA Expert
Mr. H. Tsujino	JICA

(3) JICA STUDY TEAM

Team Leader:

M. Shibuya

Members:

N. Koyama	Deputy Team Leader
N. Nagamatsu	Market Economy Specialist

Y. Uchida	Development Economist
H. Sasaki	Regional Planner
J. E. Thompson	Transport Planner
H. Nojima	Road and Road Transport Planner
R. J. Crossley	Highway Engineer
F. Kure	Railway Transport Planner
A. Tamura	Railway Engineer
I. Fujita	Port Planner
N. Kishimoto	Water Transport Specialist
H. Murata	Air Transport Planner
J. Vauchar	Management Specialist
Y. Umeki	Economic and Financial Analyst
T.Wachi	Fiscal Analyst
I. Fujita	Cargo Handling Facility Specialist

(4) COUNTERPARTS

Counterpart Leader:

W. Misterka	MTiGM

Integrated Transport Group:

R. Lozinski	MTiGM
K. Lesniak-Wasilewska	MTiGM
M. Bartczak	MTiGM
H. Zelichowska	MTiGM
T. Szemplinski	OBET
W. Socha	OBET
S. Romanski	OBET

Economic Group:

M. Bajurski	MTiGM
H. Matejuk	MTiGM
T. Szemplinski	OBET
W. Socha	OBET
S. Romanski	OBET

Transport Sub-Sector Group:

(Road)

M. Rolla	GDDP
S. Czajka	BPRSD

(Rail)

J. Byszczarz	MTiGM
K. Celinski	DG PKP
J. Olbrycht	DG PKP

(Sea and Inland Water)

K. Jaworski	MTiGM
M. Rusak	MTiGM
A. Tubielewicz	Instytut Morski

(Air)

P. Wieczorek	GILC
B. Dmowska	GILC
T. Kurek	GILC

(Motor Transport and Environemnt)

Z. Bielinski	MTiGM
J. Nawracki	MTiGM
E. Kondracki	MTiGM
St. Radzimirski	ITS

Note:

MTiGM	-	Ministerstwo Transportu i Gospodarki Morskiej
PKP	-	Polskie Koleje Panstwowe
CNTK	-	Centrum Naukowo-Techniczne Kolejnictwa
OBET	-	Osrodek Badawczy Ekonomiki Transportu
GILC	-	Glowny Inspektorat Lotnictwa Cywilnego
BPRSD	-	Biuro Planowania Rozwoju Sieci Drogowej
GDDP	-	Generalna Dyrekcja Drog Publicznyc

CHAPTER 2 FRAMEWORK FOR THE NATIONAL TRANSPORT PLAN

CHAPTER 2 FRAMEWORK FOR THE NATIONAL TRANSPORT PLAN

2.1 Outline of the Problem Structure of the Transport Sector

2.1.1 Role of Transport in Market Economy

1) Cargo Transport in Economic Growth

It is a worldwide tendency that economic expansion in a country is accompanied by diversifying growth of transport demand. During the beginning stages of economic development, when truck ownership is still low, most agricultural, mining and heavy industrial products were carried in bulk generally by railways and water transport. As economic growth progresses, industrial production gradually diversifies with various light industries typically located in the vicinity of large consumption centers. These products are, as the trucking industry matures, increasingly transported by trucks due to that modes flexibility in moving small consignments between multiple origins and destinations.

In accordance with further industrial progress and diversification, a variety of demands for shipment of final products, intermediate products and spare parts, not only between production sites and consumption centers, but also between factories and factories, appear. These shipments rely increasingly on truck transport due to the absolute advantage in flexible door-to-door services. Truck operators, in response, introduce various truck configurations to comply with diversified transport demands.

Intensifying market competition has forced many leading manufacturers to completely rationalize their logistical processes to the point that goods in transit are considered as a controllable inventory. The "Just-In-Time" transport concept, widely used in Japan, is a typical example of this approach. Goods are initially, for distances of up to 300 - 500 km, shipped by truck; beyond that point by air. Just-In-Time transport is particularly popular with hi-tech firms or any undertaking where speed is of the essence. Container transport, which integrates multiple conveyance modes, has evolved as the dominant form of international cargo movement. Carriers and forwarders who are engaged in the combined container business must therefore provide information to customers regarding type of services available, optimum route, modal choices and cost structures.

As economies evolve to higher stage of development, the role of railways will increasingly be replaced by trucks and air transport. During the 27 year period from 1960 to 1987, the railway share of cargo ton kilometers declined from 39.2% to 4.6% in Japan, and from 37.4% to 22.6% in (former) West Germany. The truck share increased over the same period from 14.9% to 50.1% in Japan, and from 32.0% to 54.5% in (former) West Germany. This trend seems inevitable in general terms. Railways, however, feature different advantages relative to trucks, for instance, economy of long-distance transport, larger capacity, less impact on environment and higher traffic safety. The railway network developed in early stages of economic development therefore needs to be rationalized with a view to adapting to an era dominated by road-based systems.

2) Passenger Transport and Motorization

Increasing motorization is closely related to economic growth in that increasing per capita income has prompted a steady shift of passengers from public to private modes of transport. During the 27-period from 1960 to 1987, the private car share of travelled passenger kilometers increased from 2.6% to 45.4% in Japan, and from 64.1% to 81.9% in (former) West Germany. Over the same period, the railway share declined from 75.8% to 37.1% in Japan, and from 15.7% to 6.1% in (former) West Germany.

The benefits of private car ownership generally include: (a) savings of public transport fares; (b) increase of comfort and decrease of travel time relative to public transport; and (c) privilege of ownership in terms of flexibility, privacy and leisure use. Furthermore, indirect factors such as development of highways, reduction of working hours, rising public transport fares, improvement of vehicle technology, development of used car market, and availability of installment plans, encourage private car ownership. These inherent benefits and externalities to encourage people to acquire cars until dis-benefits such as traffic congestion, shortage of parking space and environmental deterioration become serious constraints to car use.

Private cars, once purchased, will inevitably be used to satisfy trip purposes, even if the journey could have been accomplished by an alternative public transport mode. This is confirmed through the experiences of many countries in which the role of public transport declined as the economy expanded. Two examples seem to contradict this trend: (a) high speed inter-city train services such as TGV in France and Shinkansen in Japan; and (b) urban transport services in densely populated metropolitan regions. The former offers quicker travelling time between origin and destination stations than is possible by car (this advantage must be maximized through coordinated operations including low headway and feeder transport at stations). The latter case is not necessarily stimulated by driver attitudes or preferences, but typically by external factors such as extreme traffic congestion and expensive parking fees.

3) Inter Modal Competition in the Free Market

Transport policies adopted in many countries clearly show that traditional regulatory approaches toward transport industries have failed in the face of increasing competition between road and railway transport. Transport policy has clearly evolved away from traditional regulatory regimes toward competitive scenarios with foci toward privatization of state transport enterprises and deregulation of controlled markets. The most important issue is therefore development of frameworks which permit and foster effective competition among various transport undertakings, control government intervention and forestall excessive deregulation.

4) Implications for Preparing the National Transport Plan

(1) The Polish economy has, with an emphasis on consumer products, rapidly developed an international focus particularly so toward Western European countries. It is estimated that light industrial production will grow in coming years, although the energy and heavy industry sectors will continue to play substantial roles in the national economy. The transport industry is, in response, likely to shift increasingly to trucks to the detriment of railways.

(2) Truck cargo transport is likely to expand its role in future due to diversifying demand. There will be a need to develop road transport infrastructure including truck terminals to enhance the competitiveness of local trucking operators vis-a-vis foreign competitors.

(3) PKP needs to restructure and rationalize its operation as well as management systems to cope with the intensifying competition from road transport.

(4) Motorization will continue to grow in Poland stimulated by the import and domestic production of cars. A user charge system should be intensified and subjected to additional reviews which could recoup direct and indirect costs catalyzed by increased motorization.

(5) Public transport services in urban and rural areas are likely to suffer financially due to a shift of passengers from public to private transport means. The government needs to rationalize transport services in this regard and support development of innovative financial programs.

(6) The government also needs to develop a framework that ensures effective competition among various transport modes and companies as well as establish a policy to restructure railway, water, air, rural and urban transport sub-sectors.

2.1.2 Problem Structure of the Polish Transport Sector

The transport sector problem structure consists of four areas (Fig. 2.1.1):

(a) legacies inherited from the centrally controlled system;

(b) transition to a market based economy;

(c) international integration; and

(d) financial constraints.

1) Legacies Inherited from the Centrally Controlled System

A conspicuous characteristic of the centrally controlled system lies in the fact that resource allocation is decided by the national production and consumption program on a basis of assets owned by the state. Goods and services are produced based on the programmed supply of input at a given technological standard. Prices of goods and services are predetermined by the government, functioning just as a means for settling transactions without any particular contribution to resource allocation as in a market based economy. There seems to be no specific mechanism to adjust possible discrepancies between production and consumption. Facilities, machines and labor necessary for incremental production are supplied by the government to comply with the program.

As a component of the national economic system, transport industries, which were composed of state-owned enterprises, were centrally controlled by the government as well. Major legacies inherited from the centrally controlled system in the transport sector are: (a) distorted prices; (b) lack of efficiency; (c) habitual dependence on the state; (d) lack of inter-modal as well as inter-regional coordination; and (e) rigid regulation of transport services.

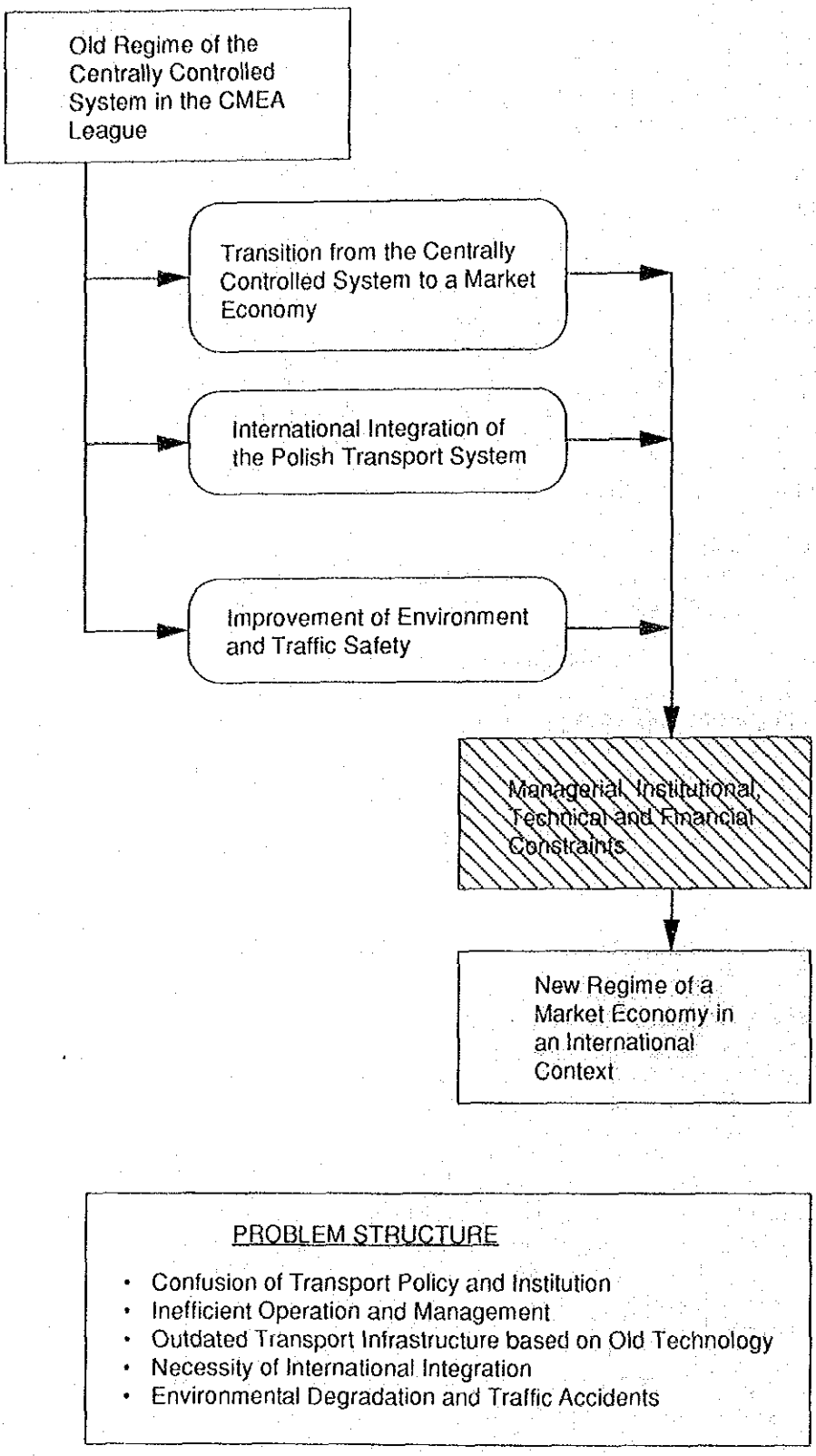

Fig. 2.1.1 Problem Structure in the Transition from Centrally Planned to Free Market Economic System

Distorted Prices: Due to the nature of the centrally controlled system, prices were distorted from those prevailing internationally with some prices being highly subsidized. This price distortion seems to be a serious obstacle to the transition to a market based economy. Passenger fares of railway and bus transport were subsidized internally and externally to keep them at lower level for the sake of public welfare. Adjustments of these fares to recoup costs, however, tend to be opposed by the public, possibly resulting in a continued subsidies for years to come.

Lack of Efficiency: In developing the transport system under the old regime, a focus was placed mostly on quantitative enlargement with less attention to efficiency improvement. In the transition to a market based economy, it is urgent that an effective cost accounting system be developed which identifies the exact reasons for profits and losses which, in turn, are the yardstick by which to measure responsiveness to market conditions.

Habitual Dependence on the State: Continuing subsidies by the state have fostered a habitual dependence by organizations and the public on the state. They also seem to contribute to a lack of efficiency and initiative which, in turn, constitute additional obstacles to the transition to a market based economy, where economic independence and survival dominate competition.

Lack of Inter-Modal as well as Inter-Regional Coordination: Inter-modal as well as inter-regional governmental coordination was unsatisfactory mainly because of the traditionally segregated administration system and a lack of scientific criteria for evaluation of investments. Close coordination between overlapping interface of each mode of transport and regions is indispensable for better satisfaction of market demand. In a market based economy, more importance needs to be placed on economic and financial aspects of investments rather than on pure technical merit.

Rigid Regulation of Transport Services: Transport state enterprises were operated under a rigidly controlled framework with all properties owned by the state. They were free from a risk of bankruptcy. Their interest, therefore, was directed to the state instead of the market. In a market based economy, however, the situation will gravitate to the opposite direction, with deregulation and liberalization being commonly accepted principles. It is likely that this dramatic transformation will cause considerable problems both to the state and transport enterprises.

2) Transport in a Market Based Economy

A market economy is an economic system in which decisions about the allocation of resources are made on the basis of prices generated by a chain of market exchanges. The transition from a centrally controlled system to a market based economy means that these economic rules must be applied to the transport sector despite its historic role as a quasi-public service. Major problems associated with this transition will include: (a) drastic transition in a short period of time; (b) decision making based on market demand; (c) reallocation of resources to comply with demand; and (d) development of a framework for effective competition.

Transport policies of the industrialized western countries have gone through several stages economic evolution: (a) era of railways; (b) era of protection; (c) era of administrative planning; and (d) era of contestability according to Messrs. K.J. Button and Gillingwater. Most of the industrialized countries are now in the era of contestability where the government role in the transport market is to define a liberalized framework for encouraging efficient performance of transport industries.

The Polish transport sector is, difficult to categorize as it is in transition from the era of protection to the era of administrative planning. Experiences of the industrialized countries, however, suggest that the transport policy of contestability needs to be introduced for attaining higher efficiency. This skips one of the stages, which, coupled with the transition from the centrally controlled system to a market based economy, will make the transformation of the transport sector more complicated and difficult.

The transition to a market based economy implies that the government will no longer control cargoes which the transport enterprises should carry. This will be decided internally based on market research. Managers of transport enterprises should become familiar with business practices applied in a market based economy including marketing, production, business administration, management training, and investment decision making.

The government, on the other hand, needs to develop a mechanism for allocating resources to satisfy market demand. For this purpose, existing statistics should be reorganized to collect overall transport information including private transport activities. Project evaluation methods acceptable to the international community should be developed in place of the traditional techniques both in economic and financial terms. It is likely that emphasis needs be placed on the movement of resources from the railway to the road sector. The government first needs to clarify guidelines which prepare state enterprises for privatization through management rationalization. Second, the government needs to develop a system which supports business activities of private companies in legal, economic and social terms.

3) International Integration

Poland's international environment has drastically changed in recent years due to collapse of the CMEA, independence of the Baltic countries, accelerating emergence of the European Community, and splintering of the Soviet Union into independent republics. The former linking of the Polish economy with those of CMEA members has ended and new integration into the EC economy is expected to take place. In a long term perspective, economic ties might be further strengthened with the Baltic countries and newly emerged republics to the east. It is likely that the East-West and North-South transactions across Polish territory will stimulate future economic activities in Poland.

The transport system of Poland needs to be developed in the context of international transport systems to take advantage of the nation's strategic geographic location. A priority should be given to the integration of the Polish transport system into the EC transport system so as to support strengthening of economic interaction as well as inviting more European citizens to visit Poland (including tourists). There seems, however, to be a variety of issues and technical gaps which must be resolved prior to attaining full integration into the EC system. A program for addressing these issues will be required.

4) Financial Constraints

The various problems mentioned in relation to legacies inherited from the old regime, transition to a market based economy, and necessity of international integration will likely require a variety of investments. It is, however, anticipated that financial resources available to the transport sector will be rather limited in the foreseeable future partly due to the accumulated external debt and partly due to limitations in the domestic revenue base.

From a national financial point of view, it would be imperative to re-allocate funds from a transport sub-sector of declining demand to another of increasing demand, from railway to road in particular. Rationalization of railways is very important in this aspect to cope with the increasing role of other transport sub-sectors. On the other hand, however, efforts to increase the revenue base should be sought by means of introducing a user pay principle, private participation in infrastructure development, and tolled motorways, among others.

The limited availability of funds necessitates strict investigation of project viability, completion of projects according to schedule, and appropriate operation, maintenance and monitoring after opening of the project.

5) Implications for Preparing the National Transport Plan

(a) Restructuring of the Polish transport sector seems to be a complicated and difficult process.

(b) Improvement of efficiency in the transport sector will largely depend on removal of legacies inherited from the centrally controlled system which will take some time.

(c) The Economic Transformation Program (ETP) introduced since January 1990 needs to be elaborated in the transport sector to make the programs of privatization and deregulation effective in improving efficiency through competition.

(d) A phased development program needs to be prepared which gradually meets EC standards and copes with the uncertain development of the Eastern republics.

(e) Re-allocation of resources is important given the limited availability of funds under present conditions. Rationalization of existing transport systems as well as expansion of revenue bases are necessary.

(f) The role of the government is critical in guiding the transition from the old regime to a market based economy, particularly so in the transport sector which offers quasi-governmental services to the public.

2.2 Objectives and Components of the National Transport Plan

2.2.1 Objectives of the National Transport Plan

The objectives of the study are defined by the scope of work, whose main objectives, are to:

(a) prepare a National Transport Master Plan to year 2005 which will effectively encourage economic restructuring toward free market orientation and integration of the Polish transport system into European and world systems; and

(b) propose priority implementation projects and programs in the short and medium terms based on the Master Plan, bearing in mind the importance of efficient and effective management and operation in the transport sector.

These main objectives can be broken down into the following five sub-objectives:

(a) Policy Formulation and Institutional Reform:

Transport administration needs to be reorganized not only for the purposes of effective planning, but also for the coordination and supervision of such important issues as public regulations vis-a-vis market deregulation, private competition among transport services, monitoring of the transport market and inter-modal investment coordination through project evaluation.

(b) Efficiency in Operation and Management:

This contributes to the reduction of state subsidies to transport enterprises through productivity improvement; the upgrading and diversification of transport services to comply with changing market demand; and enhancement of international competitiveness of transport services;

(c) Development of Transport Infrastructure:

It is expected that road transport infrastructure needs to be developed to cope with increasing demand by both trucks and passenger cars. The infrastructure of railway, water and air transport also need to be developed with a long term perspective to make the most of their respective advantages;

(d) International Integration of Polish Transport:

The Polish transport system lags to those of many EC countries. The gap needs to be filled by staged programs. International linkages should also be improved to encourage economic transactions with Poland's neighbors.

(e) Environmental Protection and Traffic Safety:

Owing to the rapid progress of motorization, environmental deterioration is becoming a social issue, especially in urban areas, and traffic accidents have been increasing nationwide. These issues need to be addressed in accordance with the standards adopted in EC countries.

2.2.2 Composition of the National Transport Plan

The national transport plan consists of five components (Fig. 2.2.1). Content of each component requires adjustment through transition from the old regime (the centrally controlled system) to the new scheme (a market based economy). The extent and speed of change will be curbed by the present status of each component and various constraints presently imposed on the country.

Component 1: Policy Formulation and Institutional Reform

A major role of the government under the old regime was to force state transport enterprises to carry goods and passengers in compliance with targets set by the government, as well as to allocate state subsidies and investment capitals among transport means. In the new regime, however, the government intends to abstain from this kind of involvement, letting competitive market forces prevail.

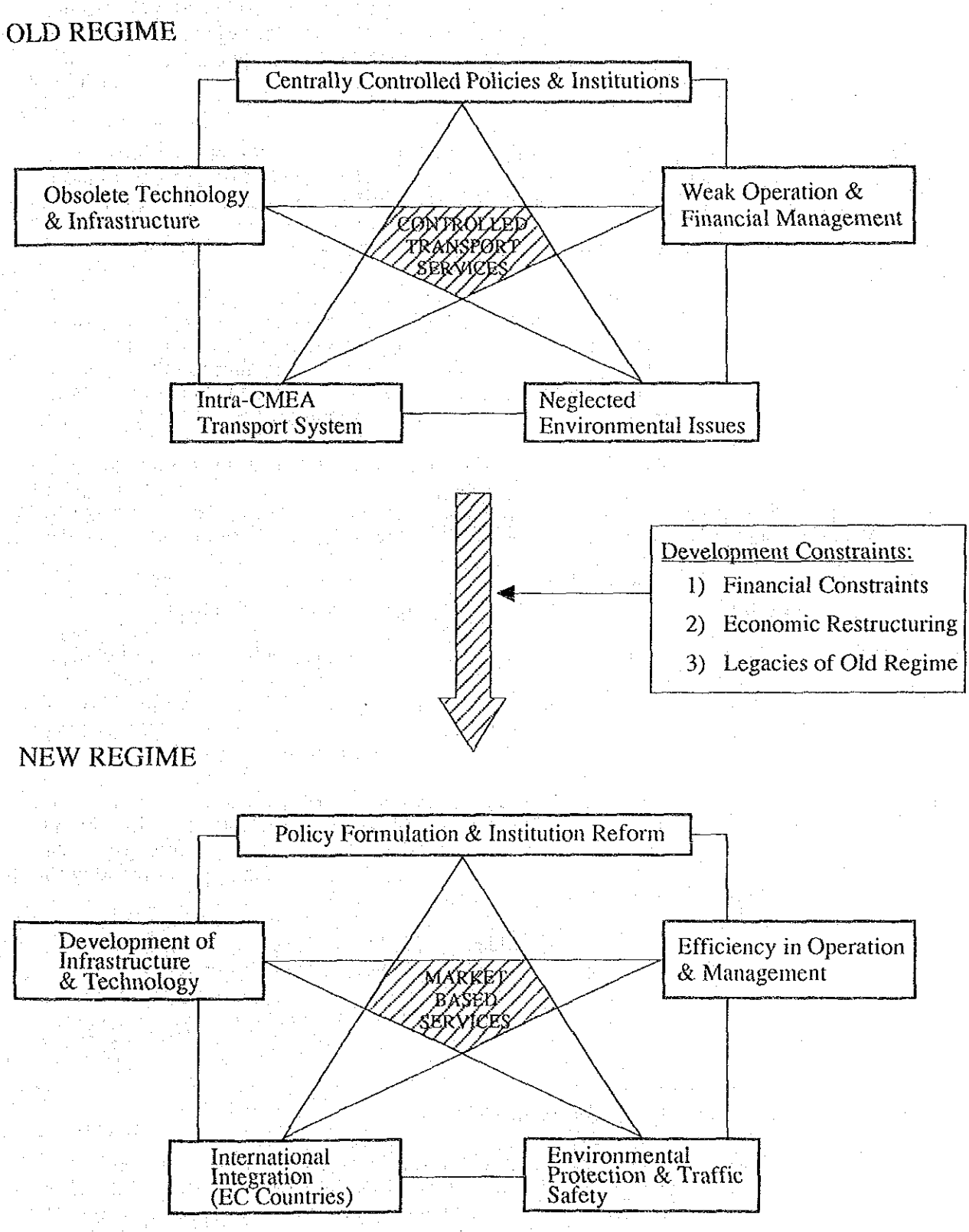

Fig. 2.2.1 Components of National Transport Plan

Consequently, the role of the government needs to be rearranged to encourage fair competition, monitor market performances and coordinate competition and public welfare. Another role of the government would be to prepare a policy which copes with the increasing number of private cars, including introduction of a "user pay" principle.

The organization of the Ministry of Transport and Maritime Economy (MTME) need to be restructured to adapt itself to these changing roles and functions including guidance of the market.

Component 2: Efficiency in Operation and Management

Transport state enterprises under the old regime were engaged in providing transport services in compliance with the centrally controlled program to carry cargoes and passengers with no fear of bankruptcy. In the new regime, however, these enterprises are expected to be financially self-sufficient and competitive with different as well as similar modes of transport.

Rationalization and modernization of both operation and management are consequently required. Privatization of state enterprises and deregulation of the market are planned to introduce and encourage improvement of efficiency (some have already been introduced).

Component 3: Development of Infrastructure and Technology

Transport infrastructure under the old regime was developed with an emphasis on extending the network and increasing capacity at a given technical standard. Progress in technical innovation in order to improve efficiency was quite slow. Modernization of the existing infrastructure and facilities is an issue to be addressed.

In terms of cargo transport, attention was focused on bulk cargo transport, including coal. In the new regime, more attention should be directed to carrying general cargo, including consumer goods and intermediate products. Adjustment to changing demand will constitute another issue to be resolved.

Due to the tight financial conditions, however, the infrastructure development plan should be prepared by taking account of: (a) streamlining and better utilization of the existing network; (b) selection of priority projects through investment appraisal; and (c) encouragement of private participation in infrastructure development.

Component 4: International Integration

Poland is strategically situated at an important cross road connecting the West and the East as well as the North and the South. The transport system in Poland needs to be integrated with the international transport system, to include infrastructure, facilities, border crossings and bilateral agreements.

Poland's transport system lags behind those of EC countries. Therefore, it will be necessary to prepare a staged upgrading program by taking account of possible improvements in the Poland's transport system, to include facilitating cross Poland transit transport.

Component 5: Environmental Protection and Traffic Safety

Development of transport infrastructure and increasing car traffic exert substantial influence on environmental degradation and traffic accidents. Assessment of environmental impact should be carried out in the case of infrastructure development. Vehicle emission standards and traffic safety measures need to be strengthened in line with EC guidelines.

2.3 Framework for the Future Polish Economy

2.3.1 Envisaged Future Growth of the Polish Economy

It can be said that the modern economic history of Poland started in January 1990 when the Polish government launched its "Stabilization and Adjustment Program" (Balcerowicz Program), which was a fundamental breakthrough from the past central planning and command approach. A set of program including complete price liberalization, a radical opening up of Polish borders to foreign trade, a sharp devaluation of zloty and subsequent introduction of a fixed exchange rate, and policies for the reform of State Owned Enterprises (SOEs) was designated to set Poland on a free market system and had an immediate impact to stop the hyperinflation of 1989.

Since the Study Team initiated the present study in May 1991, there were several changes in the leadership of the Polish government. However, our basic observations regarding the present situation of the Polish economy and prospects of future economic growth remain essentially as stated in the Progress Report, that is, Poland is firmly committed to a unique and unprecedented process, and it is not possible to turn back to the old socio-economic system.

The economic transformation during the current study's planning horizon (to year 2005) can be subdivided into four periods:

Period	Basic Features
1989 - 1992 (present situation)	Introduction of market economy principles into a centrally-planned economic system
1993 - 1995	Transition from a centrally-planned command economy to a market economy, during which Poland concurrently copes with associated fluctuations in social and economic structures
1996 - 2000	Consolidation of the market economy via various macro/micro-economic and industrial policy measures
2001 - 2005	Sustainable economic growth of Polish economy

The Study Team made projection of real GDP growth for the period 1991-2005 (Table 2.3.1). In summary, the GDP growth scenario assumes that real GDP in 1990-91 will decline by 20% from that of 1989, experience fluctuations but starting moderate economic upturning the period 1990-95, recovering at a rate of 4.0-3.0% during the period 1996-2000, and growing steadily at a rate of 8.0-3.0% during the 2001-2005 period (Fig. 2.3.1). Average rates of projected real GDP growth for the period of 1989-2005 are 1.7% per annum for medium projection, 3.0% for high projection and 0.0% for low projection.

A future direction of the Polish economy and changes in real GDP have been projected; however, it must be recognized that these projections are subject to uncertainties, since the fundamental transformation from a centrally controlled to a free market economy under a structurally changing international environment will depend on various unknown factors and important yardsticks are:

(a) how deep the economy will decline during the transition process;

(b) when the recession will hit "bottom"; and

(c) when the economy will recover to the GDP level experienced at the beginning of the economic transformation.

Furthermore, the speed of the transformation will be influenced by the:

(a) acceptance and endurance of temporal difficulties by the Polish people;

(b) support for policy directions by social and political groups within Poland; and

(c) firm financial support of Poland's historic transformation by international aid agencies and donor countries of market economies.

2.3.2 Present Situation (1989 - 1992)

For the last three years, Poland has experienced crucial changes in its economic and political systems. The former centrally planned command approach was replaced by a market-oriented system. In other words, Poland entered a path of radical economic transformation, the task of remodelling and modernizing the Polish economy. This is unprecedented in the world economic history. The implementation of the "Stabilization and Adjustment Program" (Balcerowicz Program) of January 1990 was comprehensive, including liberalization of prices, income and trade policies, as well as reforms of enterprises.

Unfortunately, the crisis in the Gulf, the collapse of the Soviet Union and the persistent low growth in EC economies have negatively impacted the program. Poland can feel proud of what has been achieved in terms of comprehensive liberalization of trade restrictions, remarkable growth of private enterprises in the industrial and service sectors, as well as reforms of the price structure. Unfortunately, negative effects include the deeper-than-expected decline in output and real income, latent inflationary pressures and increase of unemployment. Taking account of those positive and negative effects, a decline of real GDP by 20% is expected for the period 1989-91 at the start of the present study and the actual performance of the Polish economy declined just as much as originally projected.

Most recently, GUS data have shown that in the first nine months of 1992, industrial production increased by 1.2% and building activities by 1.4%. Some sources predict that the recession hit the "bottom" at the end of 1991.

Table 2.3.1 Future Growth Prospects of the Polish Economy

Period	1989 - 1992 (Present Situation)	1993 - 1995	1996 - 2000	2001 - 2005
Basic Features of the Period	Introduction of Market Economy Principles	Transition from the Centrally-Planned Economy to the Market Economy	Adjustments for consolidating the Market Economy	Sustainable Economic Growth
Gross Domestic Product (mil. US$. 1989 constant)	1989: 66,755 (100.0) 1990: 58,774 (88.0) 1991: 53,400 (80.0)	1995: (H) 59,520 (89.2) (M) 59,073 (88.5) (L) 53,400 (80.0) 1990-1995: 0.26-0.11-▲1.89 % per year	2000: (H) 72,740 (108.5) (M) 70,841 (106.1) (L) 61,900 (92.7) 1995-2000: 4.0-3.7-3.0 % per year	2005: (H) 106,410 (159.4) (M) 87,021 (130.4) (L) 71,760 (107.5) 2000-2005: 8.0-4.2-3.0 % per year
General Economic Features	- Implementation of the Stabilization and Adjustment Program (Jan. 1990) • Liberalization of prices • Fiscal adjustments • Tight monetary policy • Restrictive income policy • Zloty convertibility • Foreign trade liberalization • Restructuring of state enterprises • Financial system reform • Tax system reform	- Adjustments for mass privatization of SOEs - Average real wages may further drop - Private, nonagricultural employment to grow, but overall unemployment may further increase - Improvements in the trade balance to continue - ODA technical and financial cooperation to increase	- Economic recovery of EC countries - Recovery in output and decrease in unemployment - Gradual increase of foreign direct investments - Gradual increase in real wages - Stable value of Zloty - Increase in tax revenue - Keeping fiscal balance	- Continuation of positive economic features of the last Period - Resurgence of CIS economy and expansion of trade with CIS countries - Full membership in the EC
Economic Structure				
1) Agriculture	- 28 % of work force (1990) 13 % of GDP - Predominantly private ownership of land (18 % of land holdings by the state farms) - 6 ha of average farm size - A dampening effect of food prices by price liberalization	- To reorganize price transmission mechanisms and marketing systems - To establish rural financial systems - Privatizing state farms - Cooperatives to be restructured as business enterprises	- Raising the efficiencies of input use - Introduction of more effective mechanization - Emphasis on agricultural technology development - Development of agro-industries	- Successful transformation of agricultural structure with competitive products in the world market and with efficient distribution system
2) Industry	- 87 % of output by socialized industry (1990) - Recession affected consumes goods industries - Private sector production increasing - Restructuring of SOEs	- Provisions of a framework for anti-monopoly and competition - To introduce accounting systems of market economy - To strengthen medium- and small-scale industries - To further strengthen already competitive sectors - Restructuring of SOEs to continue	- To introduce modernized technologies and market-oriented production policy - Increase in joint-ventures and foreign direct investment - Relative priority to consumer goods industries - To introduce energy-saving technologies - Export promotions in possible foreign markets	- Successful transformation of industrial structure with diversified sectors and world-wide trade partners
3) Mining and Energy	- 95 % of primary energy production and 80 % of energy used by coal - Stoppage of crude oil imports from former USSR - High energy intensity of production	- Restructuring of coal mines - Oil imports from the rest of the world	- Energy intensity of production decreasing	- Balanced use of coal with restructured production system and oil with reliable suppliers
4) Tourism	- High potential with rich historical, cultural and natural resources which are yet to be developed - Foreign direct investment in urban hotels started	- Further investments in urban hotels - To prepare the tourism development policy	- Infrastructure developments for tourism - Establishment of the tourism promotion board	- Conservation of historical and natural resources
5) Services and Others	- Underdevelopment in the service sector - Establishment of stock exchange - Restructuring of banks - Mushroom growth of small shops	- Adjustments in the reform of financial sector - Further growth of small- and medium sized retailers	- Improvements in the quality of services - Development of financial sector	- Growth of professional services accountants, lawers, consultants, etc.

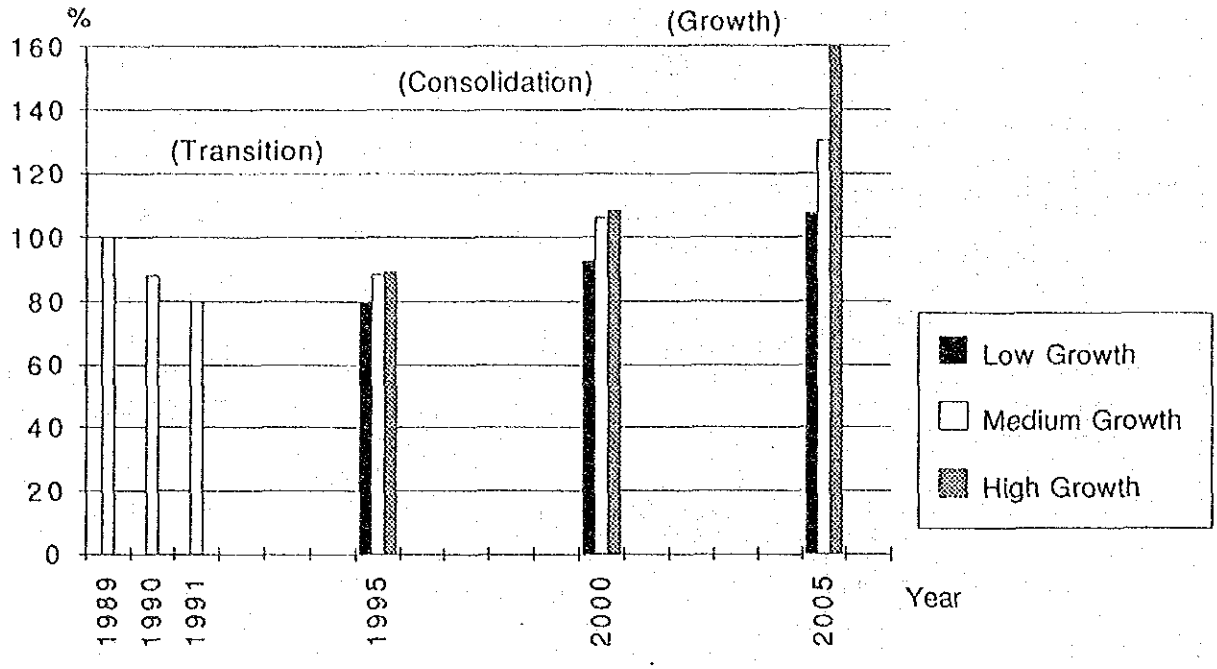

Figure 2.3.1 Projected Change in GNP

2.3.3 Likely Future Growth Scenario

1) Transition Period (1992 - 1995)

Although Poland has already firmly committed itself to the path of democratic economic reforms, legacies of the former centrally planned command economic system will likely influence the economy and society during the coming years. In order to overcome those hindrances, Poland must concentrate its efforts on stabilization of the economy. The highest priority will continue to be attached to a policy of controlling inflation and restructuring state owned enterprises, which could involve negative costs of transformation, but mainly positive evolution of economic reform. Substantial growth of the Polish economy can not be expected in this period. The growth of GDP might be nominal, but the decline of production will be arrested and the transformation of economic structure will achieve a certain progress. As an associate member of the EC, Poland will strengthen its economic ties with the EC, away from the former CMEA.

2) Consolidation Period (1996 - 2000)

The Polish economy would change its course upwards and the positive growth rate of real GDP (4.0%-3.0% per year) can likely be expected. The upturn of the economy will be further strengthened by the recovery of EC economies and gradual resurgence of the CIS economy. However, the basis of the market-oriented economy will not be strong enough, and consolidating adjustments and modifications will be required. Substantial transformation of the industrial structure, particularly the manufacturing industry, will be achieved by the turn of the century. With a view to obtaining a full membership status in the EC, Poland will further its efforts to adjust the economic system adaptable to the EC toward the end of the century. Because of the efforts, it is likely that volume of trade with EC countries as well as direct investments from them will substantially be increased.

3) Growth Period (2001 - 2005)

Poland will have completed its transformation from a centrally planned economy to a market economy and the basis for the sustainable growth of economy will be established. One might argue that ten years will be too short and one generation would be required to fully achieve such economic transformation. However, it will be possible to achieve the reform within ten years based on the factors previously presented. As a result of the EC membership status, Polish economy will be fully integrated into the EC. This is likely to boost the Polish economy if human resources and social infrastructure have been developed to support the economic and managerial requirements. Role of the Polish economy in the EC will become important in terms of economic linkage with the CISs in the east.

2.4 Spatial Organization in the Changing International Environment

2.4.1 Existing Spatial Organization

Poland has a 1990 population of some 38.2 million persons, which, in absolute terms, implies a medium-size nation. However, compared with neighboring countries in Eastern and Western Europe, Poland has a relatively large population, which enables her economy to secure a substantial size of the domestic market and human resources. Population growth was as low as 0.67% per annum during the period from 1980 to 1990.

Population is distributed almost equally to every part of the country excluding several voivodship along the eastern and western national borders and sea coast (Fig. 2.4.1). Average population density is calculated at 122 persons per square kilometer, ranging from 44 to 750 persons on a voivodship basis. High population density voivodship includes Lodz, Warsaw, Katowice and Krakow while low population density voivodship includes those situated along the eastern and western borders and the coastal line.

This is reflected in the distribution pattern of urban centers and agglomerations without excessive concentration to particular cities (Fig. 2.4.2 and Table 2.4.1): including two metropolitan areas with a population of more than two million (Katowice and Warsaw), one metropolitan area with around one million (Lodz), and four metropolitan area with a population of 500,000-one million people (Gdansk, Krakow, Poznan and Wroclaw). Although the Katowice metropolitan area has experienced over concentration of production facilities, uncontrollable over concentration which has appeared in some market economies has not materialized in Poland.

National 1990 employment totaled 16.5 million jobs, or about 0.43 employment opportunities per inhabitant. The highest absolute number of jobs was found in Katowice voivod (1.51 million) followed by Warsaw voivod (1.1 million). Katowice's role is strongly based on its dominant national position in industrial employment: almost 700,000 industrial jobs, some 15% of the national total, were located in the Katowice area. Warsaw provides most "other" jobs which include the service and retail sectors (about 641,000 jobs). However, Warsaw's position relative to the national total (7.47 million "other" jobs) was much less dominant than the Katowice industrial pattern.

The present situation described above relates to Poland's physical characteristics. However, the Polish economy and transport system lack the reverse mechanism which influences efficient spatial organization; namely, the managerial and institutional aspects which control utilization of physical capacity and transform the transport sector in response to changes in economic demand.

Urban agglomeration benefit economic agents in various ways. The city is a complex of buyers, sellers and centers of information about various goods and services. The city setting enables buyers and sellers to exchange information, to make direct and personal contacts and to complete transactions smoothly. Business services are available from merchants, brokers and experts informed about market conditions. Cities accommodate labor markets of diversified skills, and facilitate movement among work places. The service sector should play a crucial role in helping others attain the benefits of externalities of urban agglomeration, which is one of the essential conditions for economic development of industry in market economy systems.

Transport corridors are well structured in terms of connecting each voivodship with one another (Fig. 2.4.3). Railway network is extensive, airports are situated at major cities, and ports are located in Gdansk/Gdynia and Szczecin/Swinoujscie areas. The existing transport system does not lack any of the basic physical elements. The systems of transport and communication connecting different parts of the country, as well as with foreign countries, are essential not only for physical movement of people, goods, and information, but also for integration of economic agents such as producers, merchants, consumers, and investors. The latter role facilitates unification of geographically-fragmented entities into national and international markets, by maximizing advantages posed by economic extent, degree and interaction.

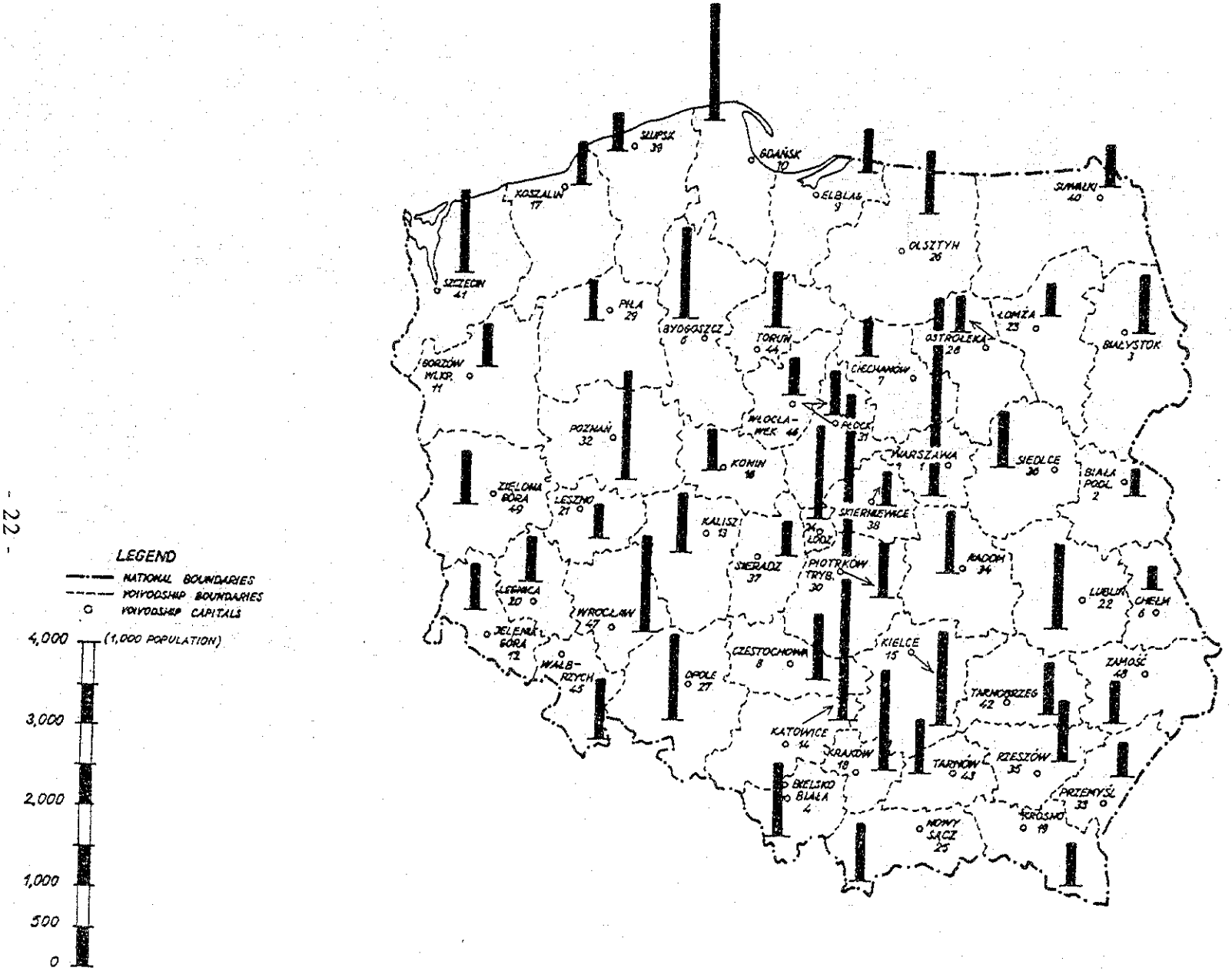

Fig. 2.4.1 Population by Voivodship in 1990

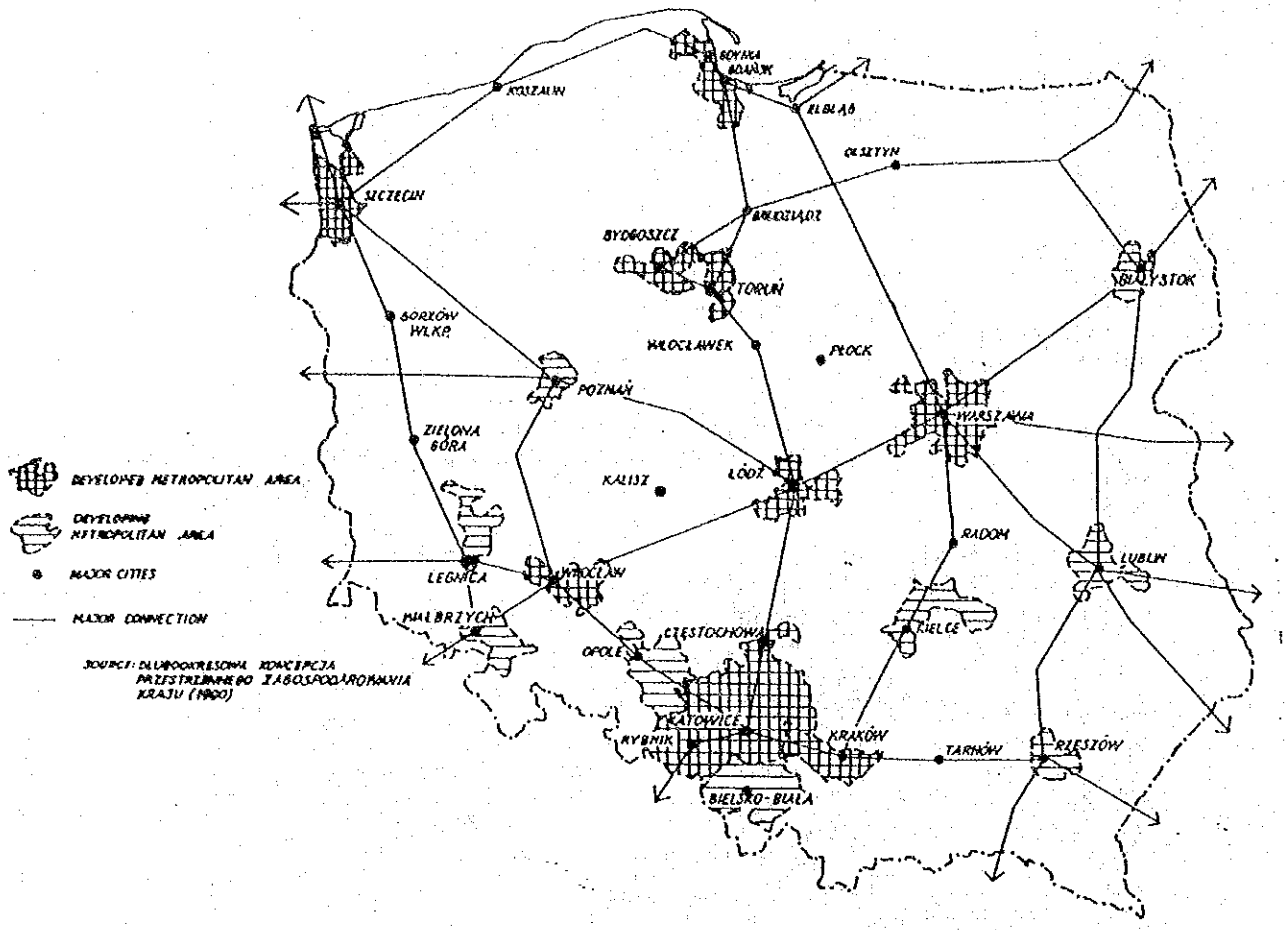

Fig. 2.4.2 Distribution of Urban Centers

Table 2.4.1 Population of Major Urban Agglomerations in 1989

		UNIT=1,000
1	KATOWICE METROPOLITAN	2,722
2	WARSZAWA METROPOLITAN	2,045
3	LODZ METROPOLITAN	1,023
4	GDANSK METROPOLITAN	821
5	KRAKOW	743
6	POZNAN METROPOLITAN	671
7	WROCLAW	642
8	SZCZECIN	446
9	BYDGOSZCZ	388
10	LUBLIN	350
11	BIALYSTOK	268
12	CZESTOCHOWA	267
13	RADOM	226
14	KIELCE	213
15	TORUN	201
	TOTAL	11,018

SOURCE: THE ATUTHOR'S OWN ESTIMATE
BASED ON GUS STATISTICAL DATA.
NOTE: DEFFINITION OF EACH METROPOLITAN AREA
WAS SET BY THE AUTHOR.

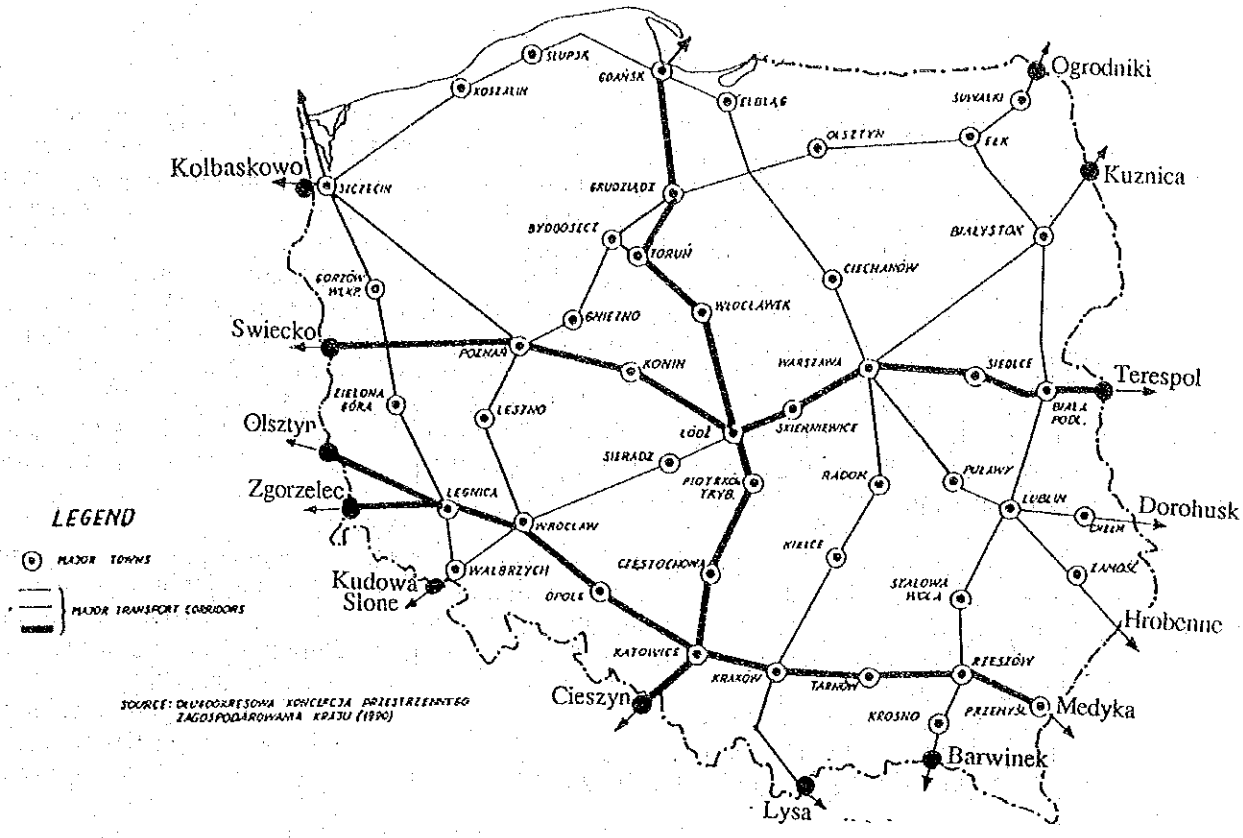

Fig. 2.4.3 Major Transport Corridors and Border Crossings

2.4.2 Future Prospect of Spatial Organization

Population is expected to continue modest, if steady, growth toward a national total of 42.0 million persons by the year 2005 (ratio of 1.10 relative to 1990). Urban population is expected to grow at almost twice the rate of total population reaching 27.8 million persons by 2005 (rate of 1.18 relative to 1990). Total employment is forecast to grow consistently with particularly strong expansion during the last five years of the study period (to 21.3 million jobs by 2005). A net loss in agricultural employment is likely but growth in construction as well as "other" (including retail and service) employment categories is expected to provide sustained impetus to economic expansion. Katowice and Warsaw voivodship are expected to dominate year 2005 population statistics with 4.35 and 3.21 million persons, respectively. Both voivodships are also forecast to house the single largest concentrations of urban population. The highest year 2005 employment total is expected in Warsaw voivod (2.01 million jobs) followed by Katowice voivod (1.85 million jobs).

Changes in spatial structure will gradually take place because prospective restructuring of the economy has to still be based on existing infrastructure and population, which are relatively evenly distributed and immobile (Fig. 2.4.4). However, in the transitional period, government investments in infrastructure needs to be devoted to those sub-sectors of the economy and those regions of the country where the most effective responses are predicted. This way of government spending might accelerate the process of geographical change. Market forces will actively influence the geographical pattern of economic development and the pattern of inter-regional migration.

Existing international transport corridors will increase the locational advantages of some areas for economic development. In the short and medium term, increased international economic relations with Western Europe are expected. In the long term, prospects for increased economic relations with other Eastern European countries and republics of the former Soviet Union exist. In this context, the international transport corridors are likely the places to attract foreign and domestic investments, as well as to revitalize entrepreneurial activities.

In general, the suitability of transport corridors to act as economic catalysts for foreign domestic investment is influenced by accrued externalities, as well as the accessibility to the Polish market and to neighboring countries. In this sense, the existing infrastructure and urban economies act as foundation elements. Therefore, larger urban agglomerations within the international transport corridors would be economic instruments of strategic importance to the national economy. Analysis of vehicle trips crossing Poland's borders suggests that, by year 2005, the Wroclaw and Krakow areas will be principal beneficiaries of such international trips; other attractive districts include Szczecin, Warsaw and Poznan.

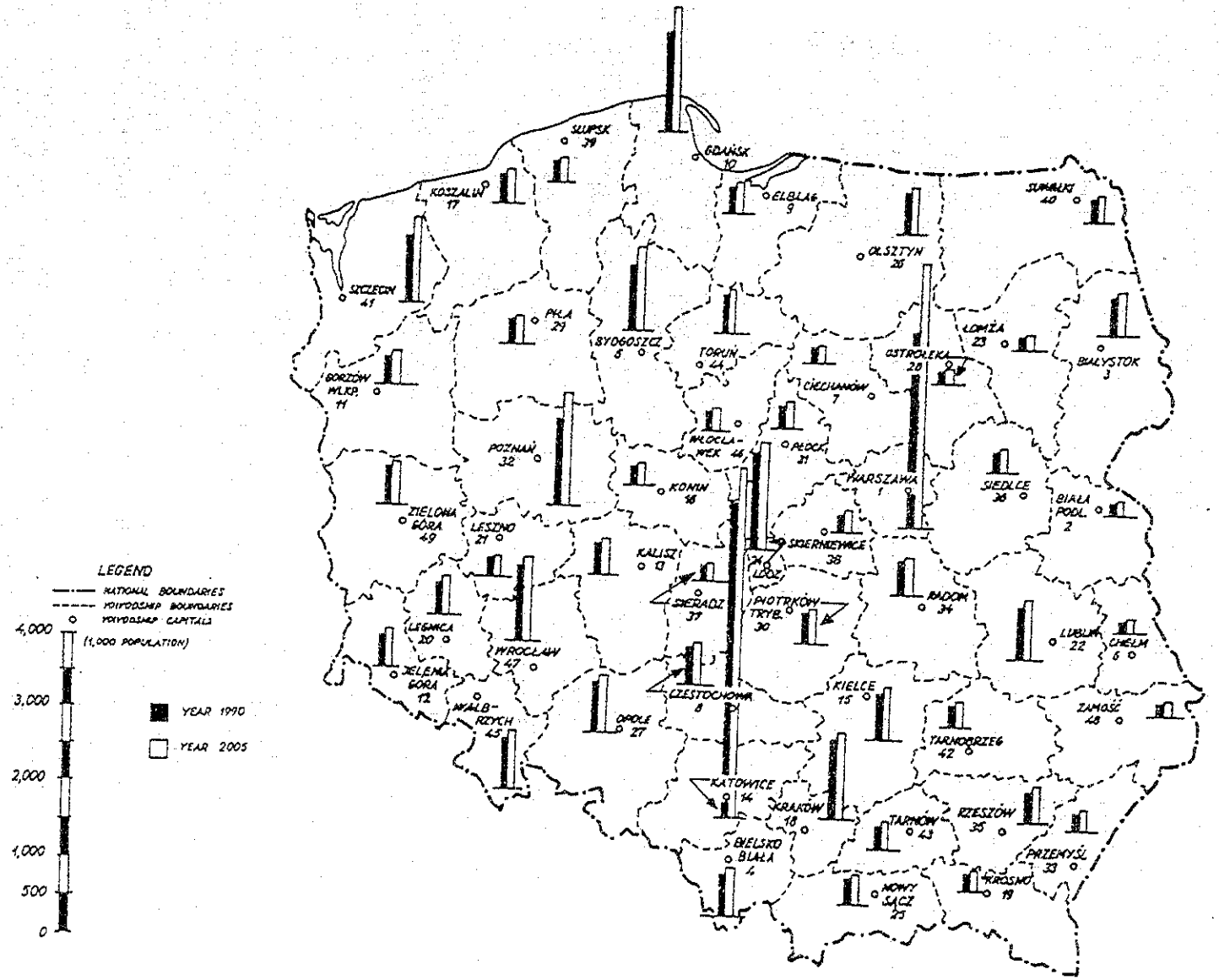

Fig. 2.4.4 Estimated Urban Population Change: 1990-2005

2.5 Estimation of Future Transport Demand

2.5.1 Overview of Forecasting Procedures

Projections can follow two possible paths: an extrapolation of historical patterns, or reliance upon future potential. The adopted approach is a synthesis of both techniques. The continuing massive restructuring of the Polish economy is likely to lead to new and unexplored horizons of activity, yet, recent evolution of the transport industry presents lessons which should not be ignored.

A two-tier technique termed "top-down" and "bottom-up" integrates these patterns within the macro - economic framework defined for the study.

(1) The top-down technique focuses on estimation of likely levels of national demand and modal split based on socio-economic indicators which, in turn, are compared to indicators of historic transport activity experienced by other European nations. Thus, a "likely" scenario of Poland's future national transport demand can be developed. This global framework, which addresses road, rail, ports and air activity for cargo and passengers, is founded on inter-relationships between national income (gross domestic product per capita), vehicle registration rates, passenger kilometers per capita expended, cargo tons per capita shipped and appropriate elasticities linking these variables.

(2) The bottom-up technique focuses on relative travel patterns and absolute demand experienced by principal national transport modes (rail and road-based systems). It is expected that sizable changes in absolute demand will occur as the economy continues to move to free-market status. However, while some focused, capital-intensive improvements in transport infrastructure are expected over the next 14 years, it is unlikely that a wholesale restructuring of Poland's physical transport facilities will take place within the study's planning horizon. Likewise, locational aspects of cities, borders and natural terrain features will largely remain. Thus, relative distribution patterns are expected to evolve from existing patterns. Origin and destination (OD) survey was carried out by the Study Team in 1991 to supplement the OD survey performed by GDDP in 1990. This lends validity to linking changes in internal (within Poland) trip demand with zonal (voivodship) socio-economic variables to include projections of population, employment and mobility.

2.5.2 Summary of Projected Demand

Forecasting methodologies address future demand from two perspectives: expected internal activity and international (external) activity. The former sets the basic tone for future internal demands (trips with both ends inside Poland) as these activity levels are strongly influenced by the future evaluation of the Polish economy. International demand, on the other hand, focuses on potential future activities related to imports, exports and transit traffic. These activity levels, while partially influenced by the Polish economy, are more directly impacted by socio-political developments in Poland's national neighbors.

There are two important factors which will have a substantial influence on the future traffic demand: vehicle ownership rate and international cross border traffic. Composite national vehicle registrations exhibit continuing increase between 1980 and 1991, totaling 7.4 million vehicles in terms of passenger cars, trucks and buses, and 9.8 million vehicles which included other kind of motorized vehicles. It is worthy to note that passenger car registrations over the last three years has grown by 7.6, 8.2 and

16.2% per annum, all at a time when national economic indicators appear to reflect "less than favorable" economic conditions. Vehicle ownership is estimated to reach 12.7 million for passenger cars, 1.9 million for trucks and 132 thousand for buses in 2005 (Table 2.5.1). Passenger cars per thousand population amounts to 301.4 vehicles.

Table 2.5.1 Estimated of Vehicle Ownership

unit: 1,000 vehicles

Year	Cars		Trucks	Buses	Total	
	number	n/p	number	number	number	n/p
1980	2,383	67.0	618	66	3,067	86.2
1985	3,671	98.7	780	88	4,539	122.0
1990	5,261	137.7	1,043	90	6,394	167.4
1991	6,112	158.7	1,152	87	7,351	190.9
1995	7,412	187.2	1,279	101	8,792	222.0
2000	9,459	231.9	1,569	116	11,144	273.2
2005	12,659	301.4	1,928	132	14,719	350.5

Note: "n/p" stands for number of vehicles per 1,000 population
Source: "Statistical Yearbook of Poland" and JICA Study Team

Vehicle crossings of the Polish border continue to exhibit impressive growth totaling in excess of 23.7 million two-way trips in 1991. Typically, between 90 and 95% of total crossings consist of passenger carrying vehicles. Growth at the Western (German) border is particularly impressive: a 1988 total of 1.94 million vehicles has, by 1991, grown to 14.9 million vehicles, an average growth rate of almost 100% per annum. In other words, traffic has virtually doubled every year since 1988. Partial 1992 data suggest that this pattern will be repeated, if not exceeded, during the current year. During 1991, almost two-thirds of vehicles entering or leaving Poland did so at the Western border. The Southern (CSFR) border accounted for near 30% and the Eastern border less than 10% of total 1991 trips. The Northern (Scandinavian) border continues to remain small in both relative and absolute terms.

Future cross border trips are estimated based on the following assumptions:

(a) External trips will grow at a faster rate than internal trips and approximately double on average every five years after 1995;

(b) The Western border will continue to experience strong relative growth to year 2000;

(c) Trips crossing the Eastern border will exhibit modest growth until year 2000. However, political decisions and an economic renaissance in Poland's Eastern neighbors are expected to catalyze a dramatic increase in crossings of the Eastern frontier during the 2000-2005 period;

(d) Traffic growth at the Southern border is forecast to follow a stable tendency without the surges exhibited at the Western and Eastern borders

(e) The Northern border will remain, relative to other borders, very modest in terms of total vehicle crossings; and

(f) Truck trips in the post 1995 period are expected to accelerate relative to the 1990-1995 period partially due to simplified border formalities.

Findings resulting from the top-down and bottom-up techniques yield dis-aggregate transport demand for future years. Annual passenger transport demand is estimated to increase from 3,816 million trips in 1990 to 5,345 million trips in 2005 (1.4 times of 1990). During the period, the share of international transport demand is estimated to increase from 2.1% to 7.4% of the total passenger transport although further increase will be likely depending on the development of international high speed passenger trains. It is estimated that road transport will play an increasingly important role in passenger transport by raising its share from 79.3% to 86.7% (Table 2.5.2).

Table 2.5.2 Estimation of Future Passenger Transport

unit: million passenger/year

	1990	(%)	2005	(%)
Modal Distribution:				
Total	3,816.0	(100.0)	5,345.1	(100.0)
Railway	788.0	(20.6)	707.5	(13.2)
Road	3,025.4	(79.3)	4,632.1	(86.7)
Air	2.6	(0.1)	5.5	(0.1)
Zonal Distribution:				
Total	3,816.0	(100.0)	5,345.1	(100.0)
Internal Trips	3,737.1	(97.9)	4,950.4	(92.6)
External-Internal Trips	75.1	(2.0)	374.2	(7.0)
External-External Trips	3.8	(0.1)	20.5	(0.4)

Source: JICA Study Team

Annual cargo transport demand is estimated to increase from 1,821 million tons in 1990 to 2,544.5 million tons in 2005. During the period, the share of road transport is estimated to increase from 82.4% to 86.9% while that of railway will decrease from 15.3% to 10.8%. In terms of zonal distribution, international cargo transport demand will grow faster than domestic demand. (Table 2.5.3)

Table 2.5.3 Estimation of Future Cargo Transport

unit: million tons/year

	1990	(%)	2005	(%)
Modal Distribution:				
Total	1,820.8	(100.0)	2,544.5	(100.0)
Railway	278.0	(15.3)	273.6	(10.8)
Road	1,499.8	(82.4)	2,211.9	(86.9)
Inland Water	10.0	(0.5)	18.0	(0.7)
Pipeline	33.0	(1.8)	41.0	(1.6)
Air	<1		<1	
Zonal Distribution:				
Total (Rail & Road)	1,777.8	(100.0)	2,485.4	(100.0)
Internal Demand	1,695.0	(95.4)	2,334.0	(93.9)
External-Internal Demand	77.1	(4.3)	142.6	(5.7)
External-External Demand	5.7	(0.3)	8.8	(0.4)

Source: JICA Study Team

Total vehicle trips are estimated to increase from 0.93 million in 1990 to about 2.68 million in 2005 (Table 2.5.4). External trips are forecast to increase relative to total trips from some 5% in 1990 to almost 16% in 2005. Sedan trips are expected to increase their relative representation among total trips. Sedan vehicle trips, while representing some 68% of total year 1990 vehicle trips, are forecast to represent almost 77% of total year 2005 trips.

A relative comparison of future-year activity to 1990 (ratio in 1990 = 1.00) reveals that (Fig. 2.5.1):

(a) Passenger car and truck vehicle registrations are forecast to grow at a much faster rate than the national economy.

(b) Truck cargo flow (tons) and bus passenger transport (passenger kilometers) are expected to reflect the economy, with cargo shipments exceeding and bus passenger travel slightly lagging, relative changes in national income.

(c) Rail cargo flow and rail passenger travel are expected to stabilize from recent intensive downturns and "bottom out" by 1995. Thereafter, modest but consistent growth is plausible leading to year 2005 activity levels whose magnitude is similar to those achieved in 1990.

The evolution of future transport activity is based on a free market environment; that is, users of transport systems are presented with choices, and will typically choose the mode that is most convenient, fastest and/or cheapest relative to their personal needs. This presents certain important implications, particularly in the sub-modal (rail versus bus) transport of passengers and, to a lesser degree, shipment of cargoes. Forecast levels of patronage rely on historic Polish user patterns and expected service enhancements to catalyze a level of public transport ridership above what could be termed the European norm.

However, the key issue facing PKP and bus operators, both public and private, is which sector can transition fastest into a user oriented entity with efficient services, competitive pricing policies and a quality of service viewed in positive terms by the travelling public. It is therefore possible that should rail operations, particular high speed trains or services geared to urban commuters (the bulk of current users) be dramatically improved, the rail share of the public transport market is likely to increase at the expense of the bus system. Conversely, if PKP is unable to effectively confront a new and aggressive adversary (private bus operators), the rail market share could be expected to decrease from currently forecast levels.

Table 2.5.4 Vehicle Trip Matrices Composition for Years 1990, 1995, 2000, and 2005

YEAR	TRIP TYPE (1)	DAILY TWO-WAY TRIPS (000)				TRIP TYPE DISTRIBUTION (%)				VEHICLE DISTRIBUTION (%)			
		Sedan	Truck	Bus	Total	Sedan	Truck	Bus	Total	Sedan	Truck	Bus	Total
1990	Internal-Internal	598.7	267.8	22.1	888.6	94.4	98.8	90.2	95.6	67.4	30.1	2.5	100.0
	Internal-External	33.9	2.9	2.3	39.1	5.3	1.1	9.4	4.2	86.7	7.4	5.9	100.0
	External-External	1.8	0.2	0.1	2.1	0.3	0.1	0.4	0.2	85.7	9.5	4.8	100.0
	Total	634.4	270.9	24.5	929.8	100.0	100.0	100.0	100.0	68.2	29.1	2.6	100.0
1995	Internal-Internal	1001.1	339.6	26.5	1367.2	91.8	97.7	89.9	93.2	73.2	24.8	1.9	100.0
	Internal-External	85.4	7.5	2.9	95.8	7.8	2.2	9.8	6.5	89.1	7.8	3.0	100.0
	External-External	4.2	0.5	0.1	4.8	0.4	0.1	0.3	0.3	87.5	10.4	2.1	100.0
	Total	1090.7	347.6	29.5	1467.8	100.0	100.0	100.0	100.0	74.3	23.7	2.0	100.0
2000	Internal-Internal	1277.4	416.7	30.4	1724.5	88.3	94.7	89.9	89.9	74.1	24.2	1.8	100.0
	Internal-External	160.0	21.5	3.3	184.8	11.1	4.9	9.8	9.6	86.6	11.6	1.8	100.0
	External-External	8.6	1.6	0.1	10.3	0.6	0.4	0.3	0.5	83.5	15.5	1.0	100.0
	Total	1446.0	439.8	33.8	1919.6	100.0	100.0	100.0	100.0	75.3	22.9	1.8	100.0
2005	Internal-Internal	1709.9	512.0	34.6	2256.5	83.3	87.2	89.9	84.3	75.8	22.7	1.5	100.0
	Internal-External	326.8	70.0	3.7	400.5	15.9	11.9	9.6	14.9	81.6	17.5	0.9	100.0
	External-External	17.2	5.1	0.2	22.5	0.8	0.9	0.5	0.8	76.4	22.7	0.9	100.0
	Total	2053.9	587.1	38.5	2679.5	100.0	100.0	100.0	100.0	76.7	21.9	1.4	100.0

(1) Internal-external includes internal-external and external-internal trips.

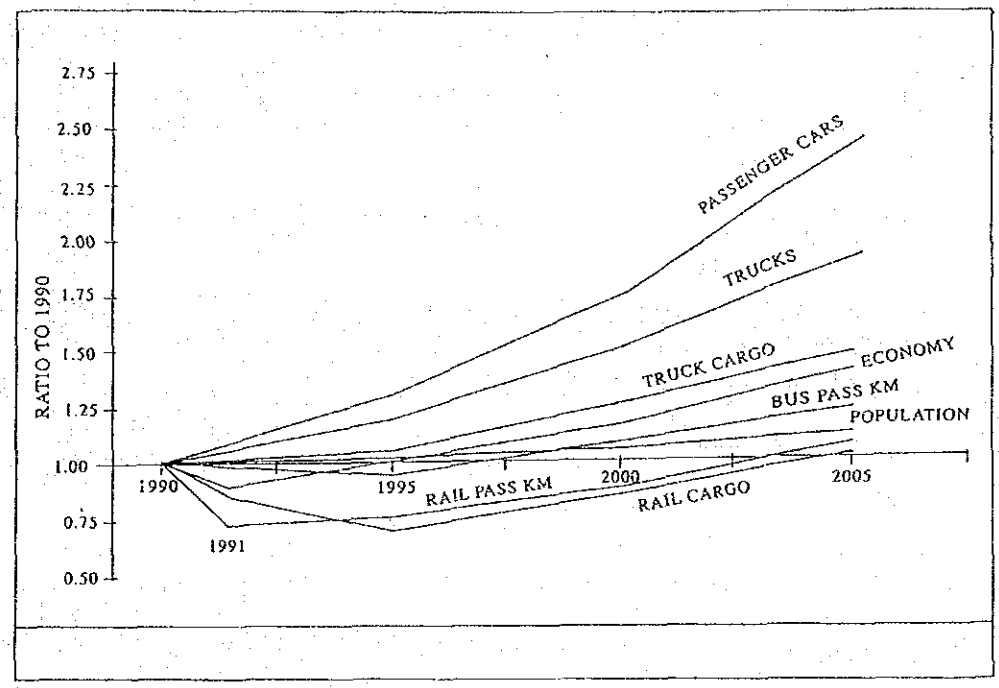

Fig. 2.5.1 Polish Transport Indicators, 1990 - 2005

2.5.3 Implications for Preparing the National Transport Plan

The projected year 2005 transport demand, as developed within the framework posed by macro-economic forecasts, presents implications for Poland's transport modes:

(a) Upgrading of road facilities emerges as a critical priority given anticipated future domestic and international trends in vehicle ownership, person travel and truck cargo transport.

(b) A stratified analysis of rail demand suggests that rail system improvements focused on specific market segments are highly desirable.

(c) Relative inland waterway and pipeline activity is expected to modify in line with general economic conditions but absolute demand is expected to remain within capacity constraints posed by existing infrastructure.

(d) Air demand is likely to grow, with a distinct focus on Warsaw airport facilities. On-going expansion of Warsaw passenger and cargo terminals capacity is expected to adequately accommodate future demand.

1) Clarification of Road System Implications

The existing road network can not, as previously indicated, accommodate future levels of person and cargo movement at an acceptable level of service.

(a) Superimposition of year 2005 demand onto the 1990 network, over 90 percent of which consists of two-lane roads, reveals that expected volumes on extensive portions of the road system will exceed available capacity.

(b) The Polish roadway system proposed by the GDDP toward the long future of year 2020 obviously represents an overdevelopment when compared to the projected year 2005 demand. However, the level of development contained in the GDDP plan will likely be required further into the future.

(c) An alternative scheme which is commensurate with year 2005 demand and compatible with the longer-term GDDP plan was derived. This concept embraces the provision of motorway and expressway-class facilities in key corridors of demand.

(d) It is anticipated that four lane cross-sections are appropriate for higher order road facilities in order to meet projected year 2005 demand. However, some motorway sections may, in the longer term future, require a six lane cross-section. It may well be prudent that, as a general rule, all motorway right-of-way acquisitions reflect this eventuality, as should design criteria for key facilities such as bridges.

(f) Motorways and expressways within Poland are expected to link with similar facilities provided in neighboring countries, particularly Germany. Currently, crossing Poland's borders by road can be a time consuming effort, particularly the Eastern border. It is therefore vitally necessary that, in future, border facilities and legal formalities be improved to the highest degree possible in order to optimize the vehicle throughput of each border crossing and to maximize the capacity and speed advantages realized through the implementation of higher-order road facilities.

The extent of the proposed year 2005 roadway system is nevertheless extensive in that the construction of several thousand kilometers of higher order roads is desirable over the next 15 years. The ability of the Polish government to finance such a program in its entirety is questionable. The formation of creative financing packages involving the private sector, the public sector, levying of tolls on some or all portions of the motorway network and/or build-operate-transfer (BOT) agreements should therefore be pursued with unflagging vigor.

2) Clarification of Rail System Implications

The conclusions to be drawn from the analysis of future conditions is that even though overall demand is forecast to approximate current levels, improvements in the rail system are nevertheless necessary in order to upgrade operations in several key areas.

(a) Approximately 80% of rail passengers can be classified as commuters or persons making a short intra-voivod journey. To prevent further erosion of this important patronage base, enhancement of short-distance, commuter services (probably with EMU trains) seems prudent.

(b) Railways still command a good market share of longer distance passenger trips between the major population centers of Poland. However, only between Warsaw and Katowice does the track system (partially) support 160 km/h operation. Consideration should be given to upgrading infrastructure in important inter-urban corridors to high speed operation.

(c) Internal cargo transport is currently, with few exceptions, accomplished without fixed schedules. Indeed, most cargo is transported between freight yards, not between producers and consumers. A re-focused marketing strategy in this regard seems reasonable if railways are to effectively confront increasingly aggressive (and sophisticated) road based operators.

(d) Passenger and cargo flows across Poland's borders are forecast to increase. Future growth could be even more dramatic depending on political and economic changes currently on-going within Poland's Eastern neighbors. A definite need exists to upgrade international rail corridors within Poland, particularly in the east-west direction and, to a lesser degree, in the north-south direction. This upgrading must also include border points to ensure that a higher train throughput is achieved.

(e) Growth in external cargo shipments will, certainly in the near term future, be "driven" by West European trade. It is likely that combined cargo transport will absorb an increasing share of European cargo shipments; it is therefore necessary that Polish railway operations implement appropriate programs to develop combined transport facilities and rolling stock.

3) Future Role of the Transport Model

Transport modelling permits a strategic evaluation of impacts catalyzed by future demand upon key transport modes. It is important that this approach forms the basis of future infrastructure planning and that the model is adopted and expanded by Polish authorities.

The forecasting of future economic and transport activity is extremely difficult particularly in light of the radical economic and political changes ongoing in Central and Eastern Europe. Thus, the conclusion might wrongly be reached that the model is flawed. However, this conclusion completely misses the point: The model is not a result in itself, but a means by which to reach a result. It is a tool through which numerous future socio-economic and mobility options may be quickly evaluated in order to gauge potential impact upon transport operations and systems.

In addition to maintaining a national strategic model, it may well be considered necessary to undertake more detailed modelling at the regional level. One approach would be to develop three or four regional sub-models within the national model, one covering each of the principal national population/employment concentrations. The regional models could include a finer zone and network structure which would enable projects to be evaluated in detail and would heighten sensitivity toward local traffic movements and other concerns. The management of these models should remain under the control of a single central entity to ensure a consistency of approach, although there is no reason why the modeling work should not, on an interim/training basis, be undertaken by private consultants. In addition, there is a role for Polish research institutions in the development of future traffic growth projections based on economic factors.

The importance of Polish authorities adopting and further developing transport model cannot be overemphasized. The required assembly of professionals to build/operate the transport planning model offers additional opportunity for the acquisition and application of additional, transport-related software.

CHAPTER 3 OVERALL NATIONAL TRANSPORT PLAN

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3.1 Introduction

3.1.1 Necessity of the National Transport Plan

The national transport plan covers the time horizon toward the year 2005. At present, everything seems to be unpredictable for the future because of the dramatic change that Poland has launched since January 1990, namely, the transition from the centrally controlled system to a market based economy in a convulsing international environment.

From an international point of view, however, there seems to be several points that are likely to happen by the year 2005:

(1) the European Community will be one of the leading growth poles in the world economy;

(2) Poland will be a full-fledged member of the EC, fully involved in the EC economy;

(3) East European countries and newly emerged republics in the former Soviet Union will be on an economic growth trend, having gone through their economic restructuring;

(4) the Polish economy will be activated and diversified by the integration into the EC economy as well as the close economic ties with surrounding countries and republics; and

(5) Strengthening economic ties with the neighboring countries will give impetus to develop Polish major urban centers respectively in an international context.

From a domestic point of view, it is likely that by the year 2005, the Polish economy would have moved into a more consumer oriented structure with diversified economic activities. Urbanization would have progressed in accordance with the evolution of urban industries including light industries, distribution functions and other type of service industries. As experienced in the western countries, motorization would have progressed further reaching to a national average of around 300 cars per thousand people.

The national transport plan need to be developed by taking account of the present conditions and future prospect of the country under the intensifying east-west and north-south international communications. As explained in the former chapter, objectives and major components of the master plan were defined in this consequence. However, it is also important to pay due attention to the specific characteristics of the Polish transport sector.

First, Poland developed a considerably extensive public transport system including railways and urban public transport during the old regime. These public assets need to be renovated and utilized to the maximum possible extent particularly with a view to complying with the financial constraints in a short term perspective as well as the rising importance of environmental protection and traffic safety in a medium/long term perspective. Of course, it is not relevant to assume that the increasing demand for cars and trucks could be suppressed deliberately by the government intervention. Instead, restructuring of the Polish public transport should be realized basically by improving

the competitiveness of transport services provided by each mode of transport especially with an emphasis on their advantageous branches of services relative to road transport.

Second, funds available to the transport sector need to be secured even under the tight fiscal conditions. This is because without efficient transport services, restructuring and revitalization of the Polish economy might considerably be delayed. Transport network constitutes the spine of the country for its future development in the international and regional context. Funds should be made available to reform the outmoded transport systems relative to those in the western countries with a focus on quality improvement. At the same time, transport industries need rationalization and modernization of their management so as to cope with the market economy in the international scene. These create new financial demand to replace the inefficient fleet of vehicles, vessels and aircraft, introduction of facilities of advanced technologies, and education and retraining of management and employees. Creation of special funds for the transport sector would be very important for the purpose of constant and steady improvement.

Third, transport improvement should contribute to earn foreign exchange where possible particularly under the present indebtedness of the country. One way will be to save the foreign exchange by attracting more customers to the Polish carriers through the enhancement of their international competitiveness. Another way will be to encourage more foreign people to visit Poland, particularly international tourists. Improvement and development of transport systems need to be accompanied by international tourism promotion.

As experienced in the recent years, it is a hard task to transform the Polish transport sector from the centrally controlled system to a market based economy as well as from the closed specialization system in the CMEA league to the international open system. Mere introduction of the market principle would not solve everything. The government initiative is important for the transformation including development of the effective framework of a market economy, creation of free and fair competitive environment, support for the transport industry's rationalization and modernization programs, improvement of environment and traffic safety, and preparation of financial arrangements for the transformation.

The national transport plan is especially important for the Polish government to guide the transport sector toward a market economy. The plan will assist the government to develop the policy measures required from time to time under the consistency with long term goals as well as the appropriate balance between the trade-offs.

3.1.2 Time Horizon of the National Transport Plan

The National Transport Plan covers the period from 1993 to 2005. The period can be divided into three phases of: (1) transition period from 1993 to 1996; (2) consolidation period from 1997 to 2000; and (3) sustainable growth period from 2001 to 2005. The year of 2000 would be a critical year when Poland formally joins the European Community from the status of an associate member by that time. According to the assumed economic framework, the Polish economy will regain the previous peak of 1989 in year 2000 through undergoing a painful restructuring of its economic system. In consequence, the year 2000 is assumed to be an important target year for Poland to be on a sustainable growth path under a market based economy with satisfactory clearance of the EC requirements.

During the transition period, a focus needs to be placed on restructuring the existing legal, institutional and organizational framework to the one operational in a market based economy. A focus needs to be given to the utmost rationalization and partial modernization of the transport systems and industries with a view to proceed to the