

# Urban transportation policy in Poland

by

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## 1. URBANIZATION AND URBAN AND REGIONAL TRANSPORT DEVELOPMENT IN YEARS 1945-1975

In the period between two Great World Wars Poland was an agricultural country where 60% of its population took the living means from farming.

The Second Great World War annihilated circa 38% of permanent productive assets. In the period after the ending of this War the process of an intensive industrialization resulted in a fast increase of the population who found their living means from other occupations.

The industrialization was accompanied by the process of urbanization, the rate of which is illustrated in Table 1. Making use of the possibilities existing in the planned economy it has been endeavored to smooth down unevennesses in the development of the individual country regions. This policy was accompanied by endeavors to slow down the growth rate of the greatest agglomerations.

The physical structure which resulted from such policy is characterized by:

- a relatively more even distribution, arrangement and disposition of the economic potential and the population,

- limited concentration of the population in more than ten already developed, developing or potential agglomerations and in several tens of medium towns; beyond the concentration of the population in the agglomerations the forming of urbanized belts being connected with the technical infrastructure corridors has been stated.

Table 1 - Total population of Poland against the urban Population in the years 1946 - 1975

Year	Population in millions			Percentage of urban population
	total	urban areas	rural areas	
1946	23,9	7,5	16,1	31,8
1950	25,0	9,6	15,0	39,0
1960	29,8	14,2	15,2	48,4
1970	32,6	17,0	15,6	52,3
1975	34,2	18,9	15,3	55,2

The percentage of population basing their living on the non-farming occupations and professions is now higher than the percentage of the urban population. This is the reason for an extensive commuting from rural areas to towns.

Being of an essential importance for the needed capacity of local transport means, taking in total in the passed

30 years, the following phenomena took place:

- increase of non-farming population
- increase of number of town-dwellers
- socio-economic development which was accompanied by the increasing mobility of urban and rural population,

- transformations in physical structure of towns; such as grouping the industrial plants in ensembles and industrial districts, decreasing density of residential districts, development of green areas etc., following in the increase of urban areas extensiveness.

During the last dozen or so years we see also a fast increase of motorization rate. Commencing since 1960 the passenger car number was doubled within five-year periods. At the actual phase of the motorization development we observe the car owner ratio is approaching the number of 100 cars per one thousand inhabitants. It is obvious that during the above period the majority of the transportation needs has been met by the public transport. The scale and the development of this transport are illustrated in Table 2.

The more important conclusions from the presented data are as follows:

1. The scope of the passenger transport service is increasing systematically both in the length of the network and in the utilized rolling stock.

2. The mobility of inhabitants in towns and in suburbs is growing.

3. The greatest development is stated in the suburban and urban municipal bus transport system. The role of the rail transport - railways and tramways - is slightly decreasing at the undecreased number of passengers.

During the last years the participation of the individual transport does not surpass 10 percent of trips.

## 2. ORGANIZATION AND FINANCING OF PUBLIC TRANSPORT

The public transport is carried out by three groups of carriers:

- Polish State Railways /PKP/,
- State Bus Transport /PKS/,
- urban or regional transport enterprises.

The PKP are servicing primarily the suburban zone of great agglomerations. In Warsaw and Gdansk agglomerations the traffic is carried out on the separated tracks. An exceptionally important role is played by the PKP in servicing the Warsaw agglomeration in which during the 1960s on the diametral line additional tracks were built in the tunnel crossing the City Centre. There are frequent stops on this line in order to shorten the distance to destinations.

The State Bus Transport is servicing the suburban zone and the rural areas. It is also an unique trans-

Table 2 – Passenger transportation in Poland in the years 1965-1975

Specification		In Year			
		1965	%	1975	%
<i>Network</i>					
State railways <sup>1</sup>	thous. of km.	23,3		23,8	
State Bus Transportation <sup>1</sup> /PKS/	– „ –	73,2		100,5	
Urban transport - street served buses	– „ –	6,1		10,6	
streetcars	– „ –	5,59		10,28	
trolleybuses	– „ –	0,90		0,89	
		0,12		0,05	
<i>Passengers total</i>					
State railways <sup>2</sup>	mln/year	6577		9630	
State Bus Transportation /PKS/	– „ –	972		1118	
Urban transport - total	– „ –	784		2219	
buses	– „ –	4821	100	6293	100
streetcars	– „ –	1640	34,0	3509	55,8
trolleybuses	– „ –	2956	61,3	2694	42,8
		225	4,7	89	1,4
<i>Rolling stock</i>					
Buses - PKS		10275		21176	
Urban transport:					
buses		4743		10404	
streetcars		4350		4600	
trolleybuses		346		106	

1. National network

2. Including long-distance trip /ca 20%/

3. Including long-distance buses

portation means in many small towns which do not belong to agglomerations. The municipal bus transport is servicing mainly the urbanized areas.

An important role in the greatest agglomerations' transport systems is played by the tram. Warsaw is here a particular case, where in the reconstruction of the totally destructed town the tram network has been constructed in 90 percent on the private right-of-way-system. Two wagon trains running at one minute intervals permit to achieve carrying capacity surpassing 12,000 passengers per one hour, in one direction. In result of separation of the tram traffic from vehicular traffic - excluding the one level crossings - no negative impact of vehicular traffic on the tram traffic system is observed so far.

An essential feature of the actual transportation policy in Poland is preserving the low fares in municipal transport. These fares were only once changed (in 1967) during a period of 30 years.

A standard system of fares is applied for single passages (excluding the suburban lines). A preponderant majority of commuters is utilizing the monthly tickets at very low prices for unlimited amount of travel.

In general a "no conductor" honour service is applied.

In result of comparatively low fares there is a deficit of municipal transport enterprises. This deficit is systematically growing in connection with widening service range and introducing a more and more modern rolling stock. At the actual moment the deficit is surpassing 33% of the total running costs of the transport.

This deficit is covered by the State's budget. Moreover from this budget the rolling stock and heavy investments are financed.

This financing of the public transport is done in conformity with the principles of state policy according to which the transport is one of the social services. There is also an opinion that the low fares are counteracting the use of private cars for commuting purposes in densely populated areas.

Great attention is paid also to the coordination of the activity of various carriers who are subordinated to various disposition centres (Polish State Railways and State Bus Transport - to the Ministry of Transport, the municipal transport enterprises - to local authorities who are supervised by the Ministry of Administration, Local Economy and Environmental Protection). In order to assure this coordination the Regional Groups for Coordination of Passenger Transport have been appointed.

As an example the range of activity of such a group in the Warsaw Agglomeration includes:

- elaborating the detailed plans and programs of passenger transport development for the region,
- coordination of the actual running operation,
- coordination of a common fare system,
- integrated design of stops and terminals,
- integration of inspection and supervision services,
- coordination in development of depots etc.

This Regional Group consists of directors representing the above mentioned three carriers.

### 3. URBAN ROADS

Before World War II Poland was known as having proverbial "Polish Roads", i.e. ground roads or the roads made of field stone. Both these two categories of roads included more than 75 percent of the urban roads.

During the last World War about 30% of the pavement and 46% of bridges and viaducts were destructed. In the after-the-war period the entire effort of the country was directed and concentrated to liquidate the effects of the war and then to modernize the roads by constructing improved pavement.

In result of the works, which were accomplished in the years 1950 to 1975, the urban roads length with the improved pavement increased five times from 5 to 25 thousands kilometers, wherein a considerable part of the new streets has the form of two-roadway arterials.

Since the sixties, in consideration of the motoriza-

tion and road traffic forecasts the process has begun which consists in preparing the urban road systems for the expected increase of traffic. A great effort was made to develop urban transportation planning.

Extensive use was made of the well-known methods of traffic studies and forecasting.

The conclusions following from the transportation studies have been taken into account in the long term physical plans which are elaborated for all towns and agglomerations. These plans are the basis for land reservation for the future roads, intersections are parking facilities. It is worthwhile to emphasize that in the towns which have such plans a rational coordination of all investments being connected with the road corridor is being implemented. For such a corridor a special plan of the location of underground facilities in the road cross-section is elaborated. In this way it is possible to build the individual facilities without any risk of their major interference with future road facilities.

Between the sixties and seventies a decisive acceleration has been achieved in the road construction. In some part it was connected with the dynamic development of housing with related technical infrastructure. At the same time the realization of higher standard roads was begun. The Lazienkowska Highway in Warsaw is an example, being an urban expressway with  $2 \times 3$  lanes of traffic and having the length of about 10 kilometers. This highway was accomplished during three years. Several other roads of this type were completed and many others are in the course of construction or design.

Dynamic modernization and development of urban roads does not mean that the principle of a full adaptation of the urban transport systems for the needs of mass motorization has been accepted.

Instead of that, a basic assumption has been made, that the freedom of vehicular traffic (in all areas, purposes and at any time) should be differentiated in dependence on the character of the area under consideration. Consequently, in the high intensity areas the car-free streets and zones have been introduced in many towns. Such a position harmonizes with the future transport policy which will be discussed in further points of this paper.

#### 4. PLANS FOR URBAN GROWTH AND MOTORIZATION

In the socio-economic longterm development plans and in the national physical development plan of the country up to 1990 it has been foreseen that the urban population will increase from 19 millions in 1975, to about 25 million inhabitants in 1990.

The distribution concept of this population is described as a "moderate policentric concentration of socio-economic activity". As skeleton of a physical structure the urban agglomerations and the urban centres of growth were taken. The total area of the country has been divided into intensive investment areas (nodes and belts of the system), agricultural areas and areas for recreational purposes.

In total 23 agglomerations have been selected as divided into three groups:

- 10 developed agglomerations,
- 7 developing agglomerations,
- 6 potential agglomerations as expected to be developed after 1990.

The numeric data which characterize the development of towns in the years 1975-1990 are set down in Table 3.

The motorization forecasts are presented in Table 4.

Table 3 - Urban population 1975-1990

Specification	Number	Population in mins	
		1975	1990
Agglomerations - total	23	11,6	16,6
developed	10	9,1	12,5
developing	7	1,8	2,9
potential	6	0,7	1,2
Urban centers	15	0,9	2,0
Others		4,6	6,2
Total		17,1	24,8

Table 4 - Motorization forecasts

	1975	1990
Private cars/1000 inhabitants	32	142
Private cars in thousands	1078	5300
Trucks/1000 persons	12	35
Trucks in thousands	425	1294
Buses in thousands	52	107
Buses/1000 persons	1,5	2,9
Motorcycles in thousands	1895	600
Motorcycles/1000 persons	55	16

It has been foreseen that in the period up to 1990 a tendency for a faster (than it was up to now) motorization development will come out on the rural and small towns areas. However the motorization index in bigger towns will be higher than the average for the total country.

The transport systems development plans for the agglomerations are based on the assumption that the motorization in 1990 will reach the level of about 200 to 250 cars per one thousand inhabitants.

The consciousness of the problems and difficulties following from such a motorization level in the biggest agglomerations inspired to formulate the principles of the national transport policy which is characterized below as based on a wider background of the urban development planning process.

#### 5. URBAN AND TRANSPORTATION PLANNING PROCES

The history of urban transportation planning in Poland is strictly connected with the history of urban planning, the beginnings of which can be found in the 1920s. An exceptionally fast development of these planning forms commenced after 1945. The Act on "THE PHYSICAL COUNTRY DEVELOPMENT" issued in 1946 has introduced a general three level planning: national, regional and local. The following, consecutive legal Acts and especially the Act on "THE PHYSICAL PLANNING" from 1961, have further reinforced the role of the physical planning.

The transport planning was initially introduced within the frame of the physical planning. The scope of the studial and planistic elaborations was comparatively modest in its beginning. Then in the midst of the fifties a fast development of transport planning began and it achieved a relative autonomy. Consequently a development of methods and techniques of this plan-

ning followed, the number and education level of its staff has increased and in the biggest agglomerations the urban transport planning offices have been established as units *independent* of the physical planning. In effect all the agglomerations and the majority of medium and big size towns were granted the long-term transport development plans with their further development guide lines.

As the most essential features of the transportation studies the following can be specified:

- undertaking the Origin (O) and Destination (D) surveys at a larger scale,

- introduction of modern methods in the traffic forecasting; at the moment the known UTPS program systems - elaborated by the US-FHWA and US-UMTA - are being applied; the said systems have been additionally enriched and adapted to the Polish conditions, among others, for taking into account the Polish specifics in the modal split, and partially different objectives,
- elaborating the methods of a rational planning of road networks public transportation,
- among others attempts have been assumed towards introducing the methods of system analysis aiming in a rational structuring of the development of urban transport systems.

The approach has been illustrated in Fig. 1.

The greatest effort towards increasing the efficiency and implementability of the transport planning has been directed however to the process of this planning, and its connection with the socio-economic and physical planning process.

As a starting point the assumption has been accepted that the objective of transport planning does not consist only in elaborating an optimum concept of the urban transport system at a given arrangement of the urban activities but also, and perhaps first of all, in stimulating and inspiring such development of a town which would enable the reduction both in the number and in the length of trips. The planning process recommended at the actual moment is presented in scheme 2.

There are two basic phases of generating the general concept of the land-use-transportation system:

- transportation studies preceding the elaboration of physical development plans; the output of these studies serves as an input to the formulation of the general concept of the physical development,

- works over the plan of the transportation system which corresponds to the selected alternative of the urban physical plan.

The above presented approach to the planning problem imposes on the transport planners a difficult task of choice, selection and adaptation or inventing the methods to create a rational (from the transport point of view) distribution of urban activities.

The above statements visualize a tendency to an accurate interconnection of the transport planning with the physical planning. This tendency found its repercussion in a final embracing of a complete evolutionary sequence of the organizational framework of urban and transportation planning.

After the period in which the transport planning was given the autonomy (in sixties) when, as mentioned, the independent urban transport planning agencies started their activity, a nationally unified organizational solution has been reintroduced, in which the urban transportation planning agencies have been combined with urban planning agencies.

The advantages which are following from the integration of various types of planning consist in creating both conditions to take into account the transport factor in development planning and in automatically

guaranteeing suitable land reserves for the planned transport facilities.

## 6. TRANSPORT POLICY IN DEVELOPMENT PLANS FOR TOWNS AND TRANSPORTATION

The principles of long and short term policy for the urban transport have been formulated as based on the results of research and development works, including also the analysis of home and foreign experience from countries with different socio-political systems and different motorization development levels.

The guide lines of the transportation policy, which have been formulated as a result of the above mentioned analyses, are being introduced in practise by the regional authorities.

These guide lines can be summarized as follows.

The urban transport policy should be shaped in consideration of the following circumstances:

- the increasing living standard of the population and its consequent mobility growth,
- development of motorization and its consequences,
- changes in the energy situation,
- environment quality problem.

Of exceptional importance is and will be the development of motorization and the requirements following from the environment protection. The availability of automobiles leads to the resignation from using the public transport. In consequence the traffic volume increases beyond some tolerable limits resulting in traffic congestion and speed reduction to say nothing about the parking problems..

If public transport is not segregated from the individual traffic, the public transport's speed also decreases and consequently its attractiveness. In result the number of public transport passengers is decreasing and economic difficulties of municipal transport enterprises are sharpening.

Attempts to solve the problem first by a better traffic control and then by building better systems of roads and new parkings are giving only partial results. It is known that at a high level of motorization (more than 100-150 cars/1000 inhabitants) no possibilities exist to equip the urban areas of high population density with roads and parkings of such quantity which could enable an unlimited use of the private car (unlimited in any direction, time and travel purpose). The disparity between the demand for roads and parking space and their supply grows along with the increasing density of trip-ends and extensiveness of an area. A relative fluency of vehicular traffic would need so dense a street network in overpopulated urban areas that it is impossible to assure in both, due to the costs and the disposed land consumption, protection of the existing buildings and human environment.

Consequently, it is reasonable to assume that even at a high motorization level in towns, especially in the large ones, quite a considerable number of travellers will further utilize the public transport, characterized by a better economy of land utilization. Hence the conclusion: it is necessary to promote and develop an efficient and attractive public transportation system.

It is to emphasize that not in every town or in each part of a town a situation exists needing to give the priority to the public transport. In fact even in the biggest agglomerations, beyond the areas on which unrestrained use of car is impossible, there are the areas - as a rule peripheral - which can be equipped with road and parking facilities adapted to the needs.

A rational solution of the problem can be achieved on condition of accepting the well-known three zones concept<sup>1</sup>.

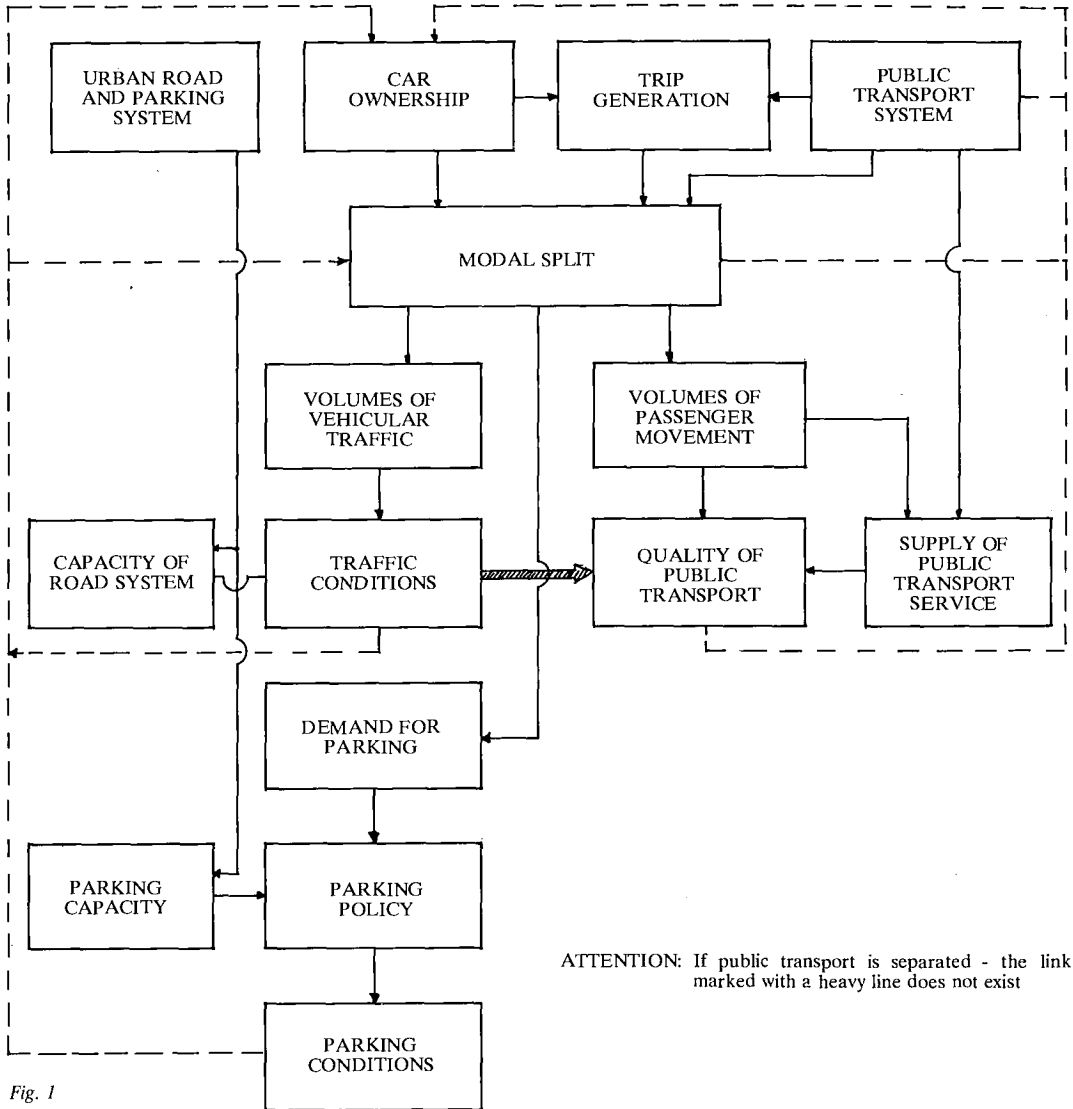


Fig. 1

Table 5 – Transport policy measures in dependence on the zone

Measure	Importance in zone		
	A	B	C
Development of rapid transit	essential	essential in traffic corridors	essential in regional traffic corridors
Priority of tram, bus, trolley-bus transport	essential	recommended in some cases	–
Prohibition of car traffic	essential	–	–
Limitation of car traffic	essential	in some cases	–
Parking policy:			
– limited number of spaces	in some cases	–	–
– fares	“	“	–
– limited parking time	“	“	–
Bicycle traffic system	in some cases	essential	in some cases
Pedestrian passages and areas	essential	in some cases	in some cases
Transfer stations:			
RTS-tramway-bus-trolley-bus	essential	essential in some cases	essential
park-and-ride facilities	–	–	“

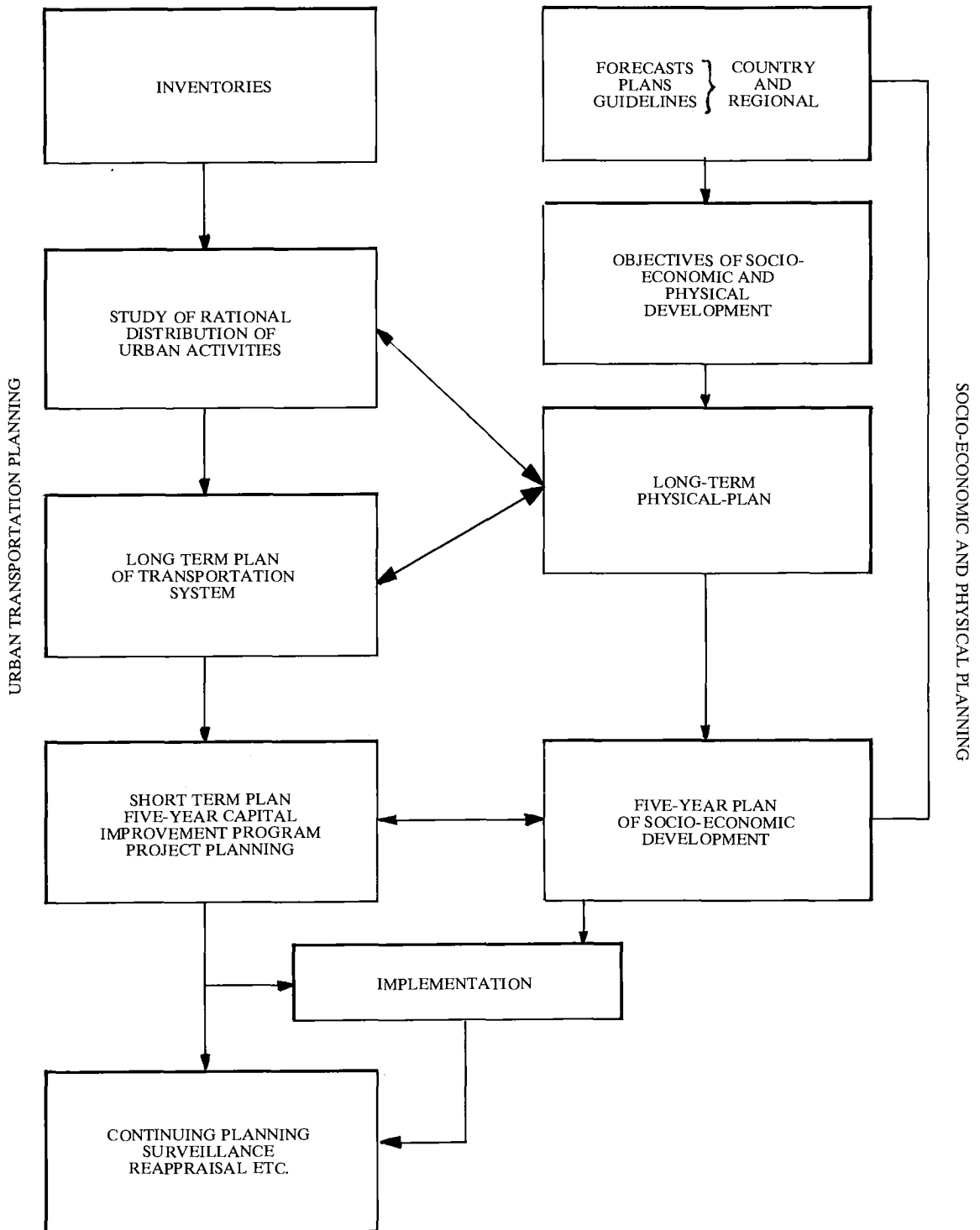


Fig. 2 – Urban transportation planning within the framework of comprehensive socio-economic and physical planning

A practical implementation of this concept would consist in applying a number of planning and organizational measures. They are listed in table 5.

A conscious acceptance of the above presented principles of the transport policy leads to complex solutions characterized by a high level of coordination and *integration* of various measures of a transport system. This integration and coordination are the more important of the larger urban area.

Besides the rational modal split the coordination and integration can be accomplished in practice by:

- a. such technical and functional solutions as:
  - direct connection between terminals and stops of public transport and passages, and the pedestrian areas;
  - forming multimodal nodes of transport (e.g. railway terminal plus metro station plus tram and bus stops plus taxi stops) at which the change of a transport mode can be done in a fast and easy way;
  - peripheral railway-bus stops on which the access from train to bus is direct;
  - peripheral interchange stops: railway (metro)-private cars (so called park-and-ride);
- b. economic and operational solutions such as:
  - uniform fares,
  - coordinated operation,
  - common financing of investments,
  - organizational integration.

These general principles of urban transport policy have been used as a base for the formulation of policies for urban areas of various types.

## 7. PRINCIPLES OF POLICY FOR VARIOUS AREAS

The differentiation of the policy primarily concerns:

- division of tasks among public and individual transport,
- choice of transport means of the public transport,
- range of recommended development of expressways.

### Agglomerations

In agglomerations, especially the biggest ones, the problems are unusually difficult. It has been proposed to accept the following principles:

1. the general solution of transport should consist in determining three zones according to the criterion of the urban activity concentration (which density of trip-end depends on);
2. in zone A (the central one) an absolute priority should be given to the public transport and the pedestrian traffic. The use of private cars may and should be constrained, among others by elimination of through-traffic, a suitable parking policy and other means of traffic control. It is therefore not necessary to adjust - for any price - the road network and parking capacity to uncontrollable growing needs;
3. in zone B (the transitional one) a development of public transport and efficient road system is necessary. On the heavy traffic corridors a segregation between the public and individual traffic will be needed. Some parking limitations may also be needed;
4. in zone C (outer one) with a low intensity of trip-ends, the road system should be adapted to the needs in assumption of a free use of car. At the same time these areas should be serviced by the public transport at such a standard level which would assure attractive conditions of travelling to zones B, and especially A;
5. as a result the public transport system should in general consist of:
  - on main traffic directions - the railroad trans-

ports (regional railroads, metro, tram on private right-of-way, possibly underground tram),

- bus transport.
6. urban expressways (connected with a system of national roads) will penetrate inside the agglomerations;
  7. outlet roads system should be adapted to recreational traffic needs;
  8. integration of the whole transport system is indispensable.

### Towns above 100.000 inhabitants

In this group of towns it is generally possible to create the conditions for relatively unconstrained use of individual private cars, or with some limitations in some parts of town.

Here are some principles concerning this group of towns:

1. Zone A, if it will be necessary, will be a small area (usually the town centre or a part of it);
2. public transport:
  - in some cases - tram with private right-of-way,
  - generally - bus transport; in zone B it may be purposeful to separate this transport means (e.g. as bus streets or bus - only lanes).
3. connections with rural roads should be solved according to the following principles:
  - national roads (especially free-ways) in general will bypass,
  - regional roads will penetrate the urban area;
4. urban expressways, in case of their necessity, have to service the external traffic as well as the internal one on the directions of the highest loads.

### Towns with 50.000 - 100.000 inhabitants

In this case the following principles are to be followed:

1. The three zones principle will be used only in rare situations. Only in the centre area of the town may it be purposeful to include the pedestrian traffic area and foresee suitable conditions for public transport.
2. As the only means of public transport buses will be used.
3. National roads should bypass the town; efficient connections between them and urban road systems should be assured. Regional roads will, in general, penetrate the urbanized area. In some cases it may be justified to design them as urban expressways.

### Towns with up to 50.000 inhabitants

1. Here is no necessity to limit the freedom of vehicle traffic, beyond slight fragments of the centre and the interiors of residential areas.
2. Public transport - exclusively buses.
3. National and regional roads should bypass the town.

The foreseen connection with the urban roads system:

- with regional roads - in any case,
- with national roads - only in case of larger centres.

A brief summary of principles recommended for urban areas of various sizes is presented in table 6.

Concerning the implementation of the above rules - almost the entire postulated approach can be found in lastly elaborated development plans.

## 8. RESEARCH AND DEVELOPMENT WORKS

Research and development works concerning urban transport problems are being managed in several Polish universities and, at the largest scale, in the Research Institute on Environmental Development - RIED.

The RIED is a state research institute supervised

**Table 6 – Policies for various urban areas**

	Agglomerations	Towns - thous. of inhabitants		
		> 100	50-100	< 50
Three-zone concept	Essential	Essential	Elements	–
Public transport:				
Regional railway	+	±	–	–
Metro	+	–	–	–
Tramway	+	+	±	–
Bus	+	+	+	+
National roads	Penetrate	By-pass	By-pass	By-pass
Regional roads	Penetrate	Penetrate	Penetrate	By-pass
Urban expressways	+	+	±	–

+ Essential  
 ± In some cases  
 – Non-applicable

by the Ministry of Administration, Land Economy and Environmental Protection. It employs more than 1200 persons wherein about 800 in research and development, approximately 70 are professors.

This Institute is working out the directions of national environmental development and the development of the elements of human and natural environment.

The scope of works include the following problems: physical planning, housing, environmental protection and technical infrastructure, including the urban transport.

The research works are being financed according to the contracts concluded with the Ministry and regional authorities and other institutions.

The most important program in the range of urban transport in the years 1971-75 was the complex project: "Development of Urban Expressways and Rapid Transit Systems in the Largest Agglomerations". This program included several tasks aimed to:

- the development of methods and techniques of planning,
- solving various technical problems,
- elaboration of the national program of development of rapid transit systems.

As a result of the work, in which the technical universities and regional planning agencies of the individual agglomerations participated as subcontractors, a long-term development program for the eight largest agglomerations has been elaborated.

An analogically complex program for the period 1976-1980 includes the research and development work on "Modernization and Development of Roads and Transport in Towns and Agglomerations" with, among others, the following principal tasks:

1. development of planning methods for urban transport systems in small and medium towns,
2. elaboration of the national development program for urban expressways,
3. development of urban roads construction technology,
4. indication of methods for improvement of existing urban mass transport,
5. specification of direction of development in rolling stock production,
6. elaboration of methods for limiting the negative impact of urban transport and traffic on environment,
7. development methods of urban traffic control.

The above stated tasks only exemplify the range of problems. A complete specification of research and development works to be done is much larger.

We have to underline the fact that in the existing Polish organization and financing system for research and development works, the entire program is ordered

to one leading unit who is playing the role of the general executor and coordinator; in this specific case which has been presented such a unit is the RIED.

### 9. INTERNATIONAL COOPERATION

Although every town, agglomeration, region and country has its specific features, there are some regularities which are common for many countries. Some of these regularities have an universal character. This calls for the exchange of information and cooperation on an international scale.

It is obvious that these regularities are especially numerous in the countries with identical or similar socio-economic systems. This circumstance determines the first step of international cooperation which could be organized in a given group of countries.

In the case of socialistic countries this cooperation has been developing for a long time in the CMEA. The transport problems are being studied by two Commissions: "Standing Transport Commission" and "Standing Building Commission".

Concerning the above discussed problems one of the more important results of the works being managed and carried out within the limits of CMEA was the specification of the general principles of policy for urban development and the urban transport<sup>2</sup>.

A still wider framework for the exchange of experience among countries with various political and economic systems has been created by the UN-ECE. The urban transport problems are, since several years, in the focus of common interest of three bodies:

- Committee on Building, Housing and Planning,
- Inland Transport Committee, and
- Senior Governmental Advisors on Environmental Problems.

The results of two seminars on "The Role of Transportation in Urban Planning, Development and Environment" (Munich 1973 and Washington 1976) are well known. Their materials are a rich source of information and precise recommendations.

A number of further valuable materials and recommendations which present the results of the activity of others, beyond the ones discussed, governmental and non-governmental, international organizations, as OECD, UITP, IRF, AIPCR, IFHP etc. can be indicated.

It can be expected that a further development of various forms of international cooperation will contribute to a more effective solving of the urban transport problems in all countries.

If one would have to indicate the form of cooperation which would serve the best to the development and progress then, as the first items, the scientific cooperation is to be exposed. It could consist, first of all,



in the exchange of information on directions of research, then, in a wider exchange of information concerning the results of the research, and finally, on managing the common works in bilateral and multi-lateral arrangements.

#### FOOTNOTES

1. This concept was positively evaluated, among others, on the UN-ECE Seminar On the Role of Transportation in Urban Planning, Development and Environment, Munich 1973.
2. SEV, Aktualnyje Voprosy Razvitija Gradostroitelstvav Stranach-Czlenach SEV, Sbornik materialov informacii Postojannoj Komissii po Stroitelstvu. No 2/1975. Ch. VI.