



Development of public passenger transport - the role and place of public passenger transport in metropolitan areas

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Abstract The study concludes governance models of metropolitan areas is that whatever solution is adopted, depending on the specific national or regional problems facing will be necessary authority or agency with the capacity planning (spatial) control, revision , preservation and application of metropolitan strategy. The metropolitan area must have the professional resources strategic planning in the medium and long term policy analysis at the metropolitan level, correlate and establish balance between sectorial interests and those of the metropolitan area. With the advent of the automobile and the transition to mass production of various auto brands were developed in parallel and road transport networks, linking the large urban areas. Populated urban centers, rural areas and are directly affected by the exponential growth of population mobility and more striking movement of goods. Road traffic is orderly movement of vehicles and people, focusing on areas of land specially arranged for this purpose, ie roads. World car park reached impressive numbers currently circulating in over 800 million vehicles of all types and categories, and every year we witness the manufacture increasingly more means of transport. Concerns worldwide enhancers public transport system people refer to various measures to reduce congestion and increase the attractiveness of high-capacity transport, especially underground and use its premises for cultural or commercial. Guidelines on the evolution of human mobility, depending on certain input variables such as socio-economic, spatial planning, transport policies and behavior of the population, bring into relief some scenarios, namely "Homo Technicus", "Homo Economicus", "Homo Contractor", "Homo Politicus" and "Homo Civis".

1. Introduction

Transport is one of the main components of social and economic life, of human society. They continue and complete the process of production of material goods, moving them to the place of

consumption. Transport creates new products, unlike industry and agriculture, which transforms the production process work items into new products.

Public passenger transport is a subfield of social-economic activity through which the movement of people in space, using vehicles on certain traffic routes in order to meet certain needs and spiritual society.

Development of transport was required for the development of production factors. Continuous increase in production volume materials, the need to exchange goods need to travel long distances for goods and people development were the main drivers of upward transport of deepening labor dimension in this activity.

Need to go to people is the consequence of various places of residence location of the work and other social needs.

Decisive influence on the development of transport in general (freight and passenger) had an invention of the steam engine, which facilitated the emergence of railways, navigation by vessels set in motion by the force of steam discoveries in the art such as : construction of the first automobile powered by an internal combustion engine (1855), the invention of the internal combustion engine with spark ignition (1889), the invention of the first plane (1905) - are events that moved the evolution and diversification of transport - the emergence and road transportation of the air.

In the US, "general concept of a metropolitan area is that of a territory containing a nucleus densely populated central and adjacent communities with a high coefficient of socio-economic integration with central territory". Current standards require that every new metropolitan area include at least: a city with less than 50 000 inhabitants and a population metropolitan 1000 000 inhabitants (1999, US Bureau of the Census), and region / Metropolitan Area (MA) It refers to an area that contains a number of autonomous administrative units, focusing on independence both metropolitan and metropolitan affairs coordination (1993, the World Conference, Tokyo). Such an approach is essential in metropolitan areas in Romania to consider a number of programs, such as those of:

- Connecting metropolitan areas to major European transport involves certain corridors connecting metropolitan areas and also improve road transport infrastructure in the localities that make up the metropolitan area so that they correspond to European standards;
- Optimization of movement within metropolitan areas by rethinking the entire traffic system and traffic light so as to ensure smooth traffic junctions in linking localities that are in the metropolitan area;
- Improve public transport joint statement aimed at decongesting transport means and especially the realization link between localities metropolitan area;
- The development of appropriate road infrastructure for movement in metropolitan areas.

The organization of the process of passenger or passengers decisive influence both efficiency and its quality, so it is necessary to pay special attention to preparing the transport process itself and the preparation (training / education) staff engaged in -a such complex and diversified to meet the rules of the road (road discipline) and compliance of employment (work discipline) to ensure the regularity of public service transport, traffic safety, etc.

Benefits are achieved by means of passenger constitute "production process" in this field and transport cycle is defined as the number of strokes, which can be performed over the cycle. Race is the work of a middle passenger transport between the two ends of the line.

2. Method of determining metropolitan areas

Accepting the idea and the reality that metropolitan areas are made up of a city (or more if they are united space) polarizing and settlements in territory surrounding strongly linked to it, the essential question that arises is why the demarcation of borders, settlements falling within the same area. We emphasize the interrelationship between the city and its surrounding towns because many people believe, mistakenly, metropolitan area as an area suburban, outer city which excludes overall socio-economic concentration just its core central polarizing. There are countless methodologies for

determining the settlements included in the metropolitan area, ranging from the simplest, establishing the maximum distance from the city center and to the deepest, whereby borders are drawn after applying a methodology for assessing the interrelation between the central city and its outer area (lit. this area is called differently: peri-urban, sub-urban, urban driving, commuting, suburban, premetropolitana, etc.). There are numerous concerns of geographers, economists, statisticians, sociologists, planners, etc., to determine the boundaries of metropolitan areas in some metropolitan areas are included only settlements declared suburbs or suburban localities, others are included in all settlements in the surrounding territory at a distance the central city (usually up to 50 km), but there are studies in this area is extended to 60 km. For example in the case of Bucharest, there are studies that include Oltenița, for instance in Bucharest Metropolitan Area. Among the most commonly used criteria for determining the limits of the metropolitan area, in addition to the distance from the city (more commonly estimated traveling time calculated in time with the means of transport most used by the population of cities in the surrounding territory) are:

- the share of people in the community who come daily to work in the metropolis (in the US, 15% of the workforce of the village is made up of commuters working in the city);
- the share of the population in these villages occupied in agricultural activities related to city (at least 75% of the population working in non-agricultural activities)
- the share of employed in agricultural production activities designed city
- the share of those trapped residents in the city, tourism potential of the town, the townspeople capitalized etc. Three experiences are known and Romania closer to reality. European Centre for coordination and research in social sciences in Vienna, which has drafted the 1972-1973 model for determining the Functional Urban Region (The Functional Urban Region) as SMLA (Metropolitan Area labor standard) and MELA (Metropolitan Area economic benefits) where SMLA includes the territory where more than 15% of the economically active residents moving metropolis daily and includes MELA territory where there is population moving every day to work in the central city.

$$I_i = \frac{C_{ij}}{REA_i} \quad (1)$$

where:

I_i = extent of commuting in the area,

C_{ij} = the area commuting between i and j

REA_i = economic active residents (employed) in the area i .

In Romania, the most popular experiences for determining the boundaries of the metropolitan area is the geographer John Jordan, in the book "suburban area of Bucharest", published in 1973, the municipalities in this area following formula:

$$X_i = \frac{\frac{1}{n} \sum_{i=1}^n R_i S_i}{\sqrt{D}} \quad (2)$$

where

R = each of the indicators listed location "i" respectively index on non-agricultural activities, commuting, urban renewal, forest surfaces, perishable goods for city ware plant and animal intended for city and tourism potential;

S = the significance of these factors;

D = distance to the city.

Also in Romania are known to Dorel Abraham published studies in 1979 and 1991 (Introduction to urban sociology) based on research carried out in collaboration with sociologists, geographers and economists to determine the peri-urban area of Bucharest. They were taken into account indicators on the following dimensions: labor, supply the city with perishable products, tourism potential, distance and spatial continuity with the polarizing city.

$$ZP = \frac{P_1 A_1 + P_2 A_2 + P_3 \sqrt{A_3}}{\sqrt{D}} \quad (3)$$

where:

P_1, P_2, P_3 = weight for the three indicators,

A_1, A_2, A_3 = standardized values for the three indicators (labor, agriculture and tourism potential for the city)

D = distance from the city polarizing.

Applying this formula settlements at a given distance from the city polarizing, obtain a peri-urban area comprising a number of settlements, some of which is immediately suburban, suburban other places near and difference, suburban area removed; with these places in town polarizing defining regional function suburban area of the city impact: non-renewable resource consumption, air pollution, discomfort to residents.

Environmental issues are: emissions into the atmosphere, discharges into water, waste generation, contamination of soil and groundwater, use of raw materials and natural resources, energy use, emitted energy (heat, radiation, vibration) noise generation.

3. Components and organizing system public transport

During the race runs the following: passengers board the means of transport at the head of line mayor, ensuring passengers, transporting passengers to the destination, shipment during the intermediate stations, as appropriate, disembarking passengers at intermediate stations of the race, landing line break passengers finally resumed the direction of the return path(fig. 1).

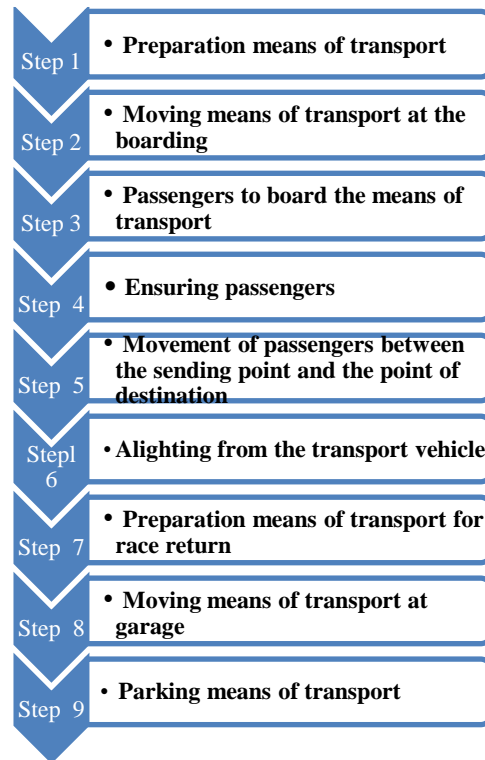


Figure 1. Flow of public passenger transport operations shown in the figure below.

Cycle (D_c) shall comprise the following times: during the preparation of the means of transport to leave for race (includes timings related technical preparation of vehicles for their adaptation to the characteristics of the journey, for action is the mechanization of operations of embarkation - landing passengers, preparation of documents (T_p) during the moving vehicle at primary boarding (end of line) (T_d); time to perform one or more races, including the time of embarkation - landing

interim passengers at stations within race (T_c) time to return the vehicle after the last landing of passengers (last race) in point sidings, where due to start another cycle (T_i).

Transmission cycle is between the start of the first vehicle operations training and teaching time of conclusion of the last operation of the transport documents (after parking the vehicle):

$$D_c = T_p + T_d + T_c + T_i \quad (4)$$

Knowledge of transport operations which make up the cycle of special importance, since each of them consumes labor and materials; as these expenses are lower, the cost of transportation is less, knowing that often share the costs for conducting other operations than those for actual transportation operations is greater.

Therefore, it is a necessity reducing their weight at minimum limits in this regard, reducing downtime and eliminating as much as possible, unladen journeys we have a rational use of vehicles and transport costs minimal.

Means of transport in the public passenger transport, cycle or ride, carry journey laden and unladen journey traveled zero.

Itinerary (circulation path) path to go through the means of transport, stations the journey, hour and minute crossing, commercial speed and downtime. Ideally, the entire public passenger transport activity to be carried out based on predetermined routes, with appropriate rhythm and to a timetable as accurately, with a maximum deviation of 30-40 seconds, but road is conducted under the influence of random factors, acting independently of the carriers, which do not always take place according to the schedule circulation timetable.

During loaded (I_l) the distance in kilometers covered by the vehicle laden (total or partial). During unloaded (during empty) (I_u): distance in km traveled by the vehicle empty state (in during the race it does not have passengers).

During zero (I_z): the distance traveled by the means of transport from the point of loading garage, specifically primary line head and the disembarkation point, that final line head (last race) garage. During the vehicle's total (I_t) = $I_u + I_l + I_z$ (km).

The races that make up the cycle of transport is based on a route (trail running) that vehicles must follow. In organization and management of public passenger transport system should be kept in mind that the road can create disturbances of public transport schedule for such situations must be clearly defined measures to be taken to ensure that disruption of traffic to be phased out in a time as small and return to the normal schedule as quickly transport.

4. Conclusions

Advantages and disadvantages of setting up metropolitan areas.

Establishment of metropolitan areas responds to needs and opportunities caused by organic development of settlements. Urbanization European territory led to the development of metropolitan areas with interdependent localities in their area of influence, already forming metropolitan realities primary, if not practically operate metropolitan areas are designated as areas uniform, relatively independent. Thus, "real country" urban-rural development realities calls for greater recognition and proper regulation of the "legal country" and those providing governance in Romania. Many strategic issues of urban planning at European level cannot be treated directly than at metropolitan areas, to facilitate the development of production, trade and consumption of goods across Europe so as to avoid obstacles due to both localism excessive as centralism and nationally. It is essentially the formation regions and metropolitan areas as poles of growth and development across Europe, included within national and transnational strategies. Metropolitan areas can thus become bridgeheads to benefit from new ways of communication and trade relations, exchange of goods and services, know-how, as centers of capital movements as destinations for tourism and buyers. The development of metropolitan areas facilitates integrate spatial planning at the regional level so as thereby to diminish the disparities between the center and the periphery area caused by dispersion (or marginalization of ghettoization, isolation of settlements deprived of opportunities), plan demographics, social and economic by imbalances transport, infrastructure financing, reserves space for living and commerce, the removal or mitigation of such imbalances would lead to an

improvement in quality of life. Strengthening the capacity of the settlements included in the metropolitan area to face competition from outside. Identifying common trends of development and cooperation within area as new forms of institutional organization and administration, representing the interests externally, will strengthen their capacity to cope with competition. Therefore shall ensure economic competitiveness settlements in the metropolitan area to neighboring regions. Implementation of development policies and planning through effective management and performance, the foundation of development policies to take account of market demand, but also other requirements related to ensuring densities bearable, technical and social infrastructure (services), supply close to dwellings, the location of recreation areas etc. Development of this policy is usually done through good cooperation between municipalities in land development, housing, infrastructure, economic development, environmental protection, human resource etc. The best performing shares are usually those related to transport, water supply, waste management and investment projects. Ensuring subsidiarity metropolitan areas by attracting public participation in various settlements in developing and implementing the strategy development of the area so that objectives and purposes planning to become more efficient. As we know, democracy and subsidiarity cannot be applied if a decision maker is missing. This means that the population of metropolitan areas, even at the periphery of them can have an influence on decisions from the metropolis that would affect their lives. Ensuring sustainable development of the metropolitan area requires a strategy that takes into account the social and economic needs of the population and is based on the scheduling option, following an impact assessment compensates best waste of resources that cannot be immediately restored or replaced, so do not limit the future development of the area. Sustainable development implies the existence of an overview on the environment, evaluating the improvement of the quality of the urban environment, urban renewal and regeneration of resources that would diminish the negative impact of development strategies of the area and ensure development in this context can determine the areas to be protected as the natural vegetation can be assessed values of the world and village places, due to cultural and ecological values should be helped to acquire the right of national heritage. Disadvantages of the creation of the metropolitan area to consider about possible traffic jams due to increased circulation, environmental pollution caused by urban waste, and the use of non-organic means of transport. In the plan there is a danger of limiting government involvement Townships at a formal collaboration or lack of trust of local governments settlements in local planning bodies. Of course, there is the danger that certain interest groups to influence local planning zonal exaggerated. These issues are more abnormal, but they must be prevented. In practice there will be difficulties in coordination between the instruments local and regional planning, to achieve a uniform policy for the use of reserve power, reconciliation between the proposals of local governments in terms of infrastructure and equipment planning, land use by different agents mayors and maintaining ecological balance etc.

The main indicators used are: location of population and employment, displacement volume when using motorized transport and public transport modal division, the level of pollution.

The scenario "Homo Technicus" envisages a hierarchy depending on the degree of training at the expense of a scale considerations native, given current trends influencing society. They won two orientations, namely:

- development of infrastructure with its own running track and some modern vehicles, such as hybrid or fuel cell, in order to comply with directives on the environment and that retrofitting the fleet;
- qualitative and quantitative development of public transport is another way of economic progress consistent with the principles of sustainable development, bowing to the principle that the production of electricity to maintain the operation of public transport problematic environment.

In this scenario assumes service quality technical considerations related to: improve comfort and increase speed, optimize energy consumption and organizational considerations that take into account the frequency, frequency, reducing subsidies.

The scenario "Homo economicus" cost- and real prices of mobility and is designed to take into account on the one hand a failure of technical progress in reducing the environmental impact and on the other hand distrust in political actions with a political character.

The scenario "Homo Contractor" is linked to the control of mobility, in terms of reducing it, and constraints on mobility are accepted, but the values of democracy and individualism in modern society remain intangible.

The scenario "Homo Politicus" assumes control of space and is based on collective processes of the organization. Transport policies transupun collective decisions in favor of the individual and public transport is sustained presence anywhere is absolutely necessary, such as residential areas with high potential for jobs and housing owners isolated or peripheral, are taxed extra.

The scenario "Homo Civis" meets several criteria for sustainability: reducing individual motorized transport, pollution, reduction of the speed of expansion of the urban area, increased travel by collective transport modes "light" trucks.

Actions resulting from the simulations scenario "Homo Civis" involving the application of measures on urban space (the space distribution of population and jobs within the meaning of their proximity to the reorganization prices land) penalty go with the car individually implement a system vignetting urban to control the town center, reducing parking paid by companies, limiting and uniform maximum speed of vehicles on all types of roads, development offer collective transport, orientation behavior towards the use of collective transport and means "light" transport, reducing the number of daily movements, especially movements between home and work.

These actions increase the attractiveness of collective transport compared to motorized means of transport and relocation habitat trends established in the suburban area.

The simulations have highlighted the key role of reducing travel speed for individual vehicles. In a first step measure linked to a surge of collective transport supply movements and change the partition number increases modal shift from motorized transport. In the second stage, with an accompanying increase in the supply of urban housing that offer, the price of land in the city center it will become more compact and reduces pollutant emissions. Restoring blade size urban spatial, social and environmental brings another positive consequence: increased travel means "light" trucks.

The minimum requirements to be met for the introduction of an effective public transport and urban environmental protection are:

- adoption of integrated and complementary measures in all areas of public transport development;
- adoption of an integrated planning policy sustainable social and environmental protection, including the promotion of non-motorized transport and restrictive measures to traffic for particular;
- collaboration of all stakeholders in promoting public transport;
- public transport are an integral part of everyday life offers many opportunities inhabitants;
- achieving promotion of public transport, and especially those that perform environmental protection by adopting long-term policy.

During this period, the world is forced to review the future role of the automobile in cities, in one of the most serious transformations of the last half century, namely how to design transport. It is a paradox that just cars and trucks that made possible the massive urbanization are now contributing to the degradation of cities.

Metropolitan governance models existing today in Europe are classified by METREX (Network of European Metropolitan Regions and Areas) in three categories:

1. metropolitan authorities have discretion as to the social, economic, infrastructure, environment and planning or land use. These authorities are responsible to plan and implement effective and comprehensive strategies for the harmonious development of metropolitan areas.
2. Authorities, appointed or elected, provided with essential selective powers through which to plan and apply strategies to solve key problems.

3. Agencies metropolitan called complementary or bodies entrusted with responsibilities for strategic planning and advisory enforcement. Public passenger transport process envisages and includes all operations carried out by vehicles driving people to carry passengers into space. In organization and management of public passenger transport system should be kept in mind that the road can create disturbances of public transport schedule for such situations must be clearly defined measures to be taken to ensure that disruption of traffic to be phased out in a time as small and return to the normal schedule as quickly transport. The organization of the process of passenger or passengers decisive influence both efficiency and its quality, so it is necessary to pay special attention to preparing the transport process itself and the preparation (training / education) staff engaged in -a such complex and diversified to meet the rules of the road (road discipline) and compliance of employment (work discipline) to ensure the regularity of public service transport, traffic safety.

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