

Development of public transport and its effects on the economy

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Abstract: *Strengthening macroeconomy of transport is achieved through the economic, social and political progress of any state, community, region, nation or group. This depends on reducing the disadvantage and the cost of conquering space and also there are highlighted the development cycles in private economy with cycles of investments in transport.*

Keywords: *public transport, efficiency, economy, expenses, promotion, development plan*

JEL Classification: *R40, R41*

I. Introduction

Sled, canoe, raft and wheel were great inventions of prehistoric man and he continued to attach importance to improving transportation. The evolution of public transport was required by the progressive development of production factors. First contributions on the influence of public transport on the general economic development date back to the mid nineteenth century [1]. Many of the technique gains, more or less important at that time, were at the basis of development and modernization of the technical and material industry of transport, which later was able to provide people with a wide range of services in an increasingly reduced time. Strengthening the macroeconomy of transport is achieved much later, when there are highlighted the development cycles of private economy with the cycles of investments in transport, particularly in transport infrastructure[2]. If at the beginning of development in economy, transport was part of the trade activity then by deepening the division of labor it is individualized and contributes to develop the great industry, which it serves. Currently most countries, under the direction of developments in economic and social processes, find in the transport field, the need to improve the phenomena of congestion, to relief undesirable effects that transport

generates about ecology, to develop coordinated services and logistic systems providing the service necessary for society at an as low as possible cost [3].

II. Economic efficiency of public transport

The traditional approach has two big disadvantages in transport policy and planning. First it generates more transport and therefore provides only short-term and unsustainable solutions. Secondly, it ignores the negative aspects of increasing transport activities, such as air pollution, climate change, noise, road accidents etc. In European cities, the negative impact of traffic causes an economic damage worth 100 billion each year, corresponding to about 1% of the EU GDP [4]. The social need for mobility has been misunderstood as being equivalent to improvement of infrastructure for automobiles. The urban sprawl makes public transport or alternatives to private car become less viable, creating a vicious circle.

A sustainable transport system is one that:

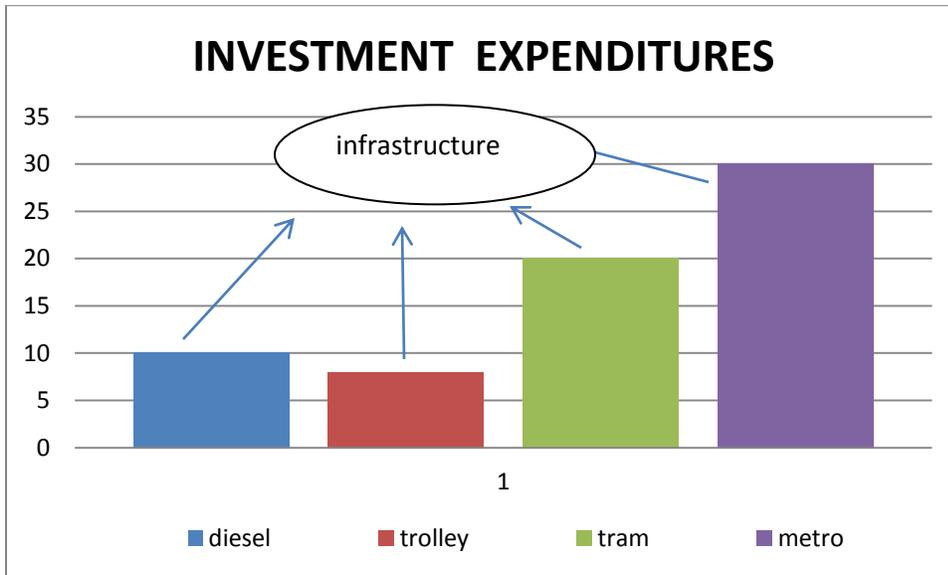
- ✓ allows individuals, companies and society to satisfy their basic mobility needs in a way that preserves human health and ecosystems, and promotes equity within and between successive generations;
- ✓ is accessible, efficient, offers a wide range of transport modes and supports a competitive economy and balanced regional development;
- ✓ limits pollutant emissions and waste within the carrying capacity of the planet to absorb them, uses renewable resources at or below their level of generating and uses renewable resources at or below the levels of development from renewable substitutes, while minimizing the impact on land use and noise generation .

Energy savings of around 400-500 kg fuel per inhabitant annually can be made in cities with a high modal share of public transport, compared with cities relying mainly on private cars. On the contrary, in cities where the public transport proportion has decreased, such as Eastern European cities, Glasgow or Brussels, energy consumption increased. Energy efficient cities have a high proportion of pedestrian transport, bicycle or public transport [5].

Expenses related to investment and operational costs for various means of public transport are shown in Figures 2.1. and 2.2. It is noticed that the costs for the acquisition of a tram are 5 times higher than the ones for a trolley, and a subway costs 2 times more than a tram. Also, metro and tram have the highest operational expenses. For this reason these means of transport are economically effective only in case of a high volume of

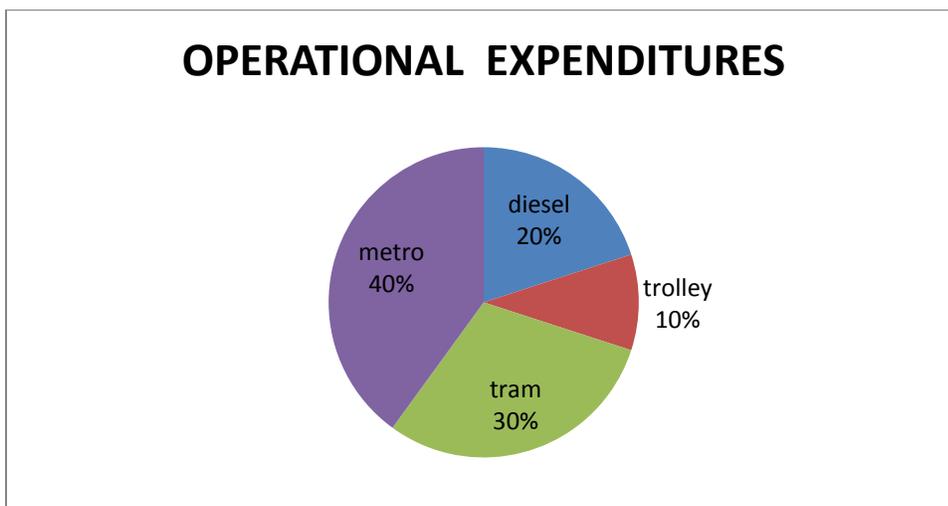
passengers. The investment must be justified by an intensive use of the mean of transport and by a long period of using the vehicles [6].

Figure 2.1: Expenses related to investment for diesel buses, trolleybuses, trams and subway



Source: Schuchmann, A., New Horizons for Urban Traffic. Innovative Electric Bus Transit Systems, Session 6a: Energy and power supply. What do electric systems cost, Power Point presentation, 2013

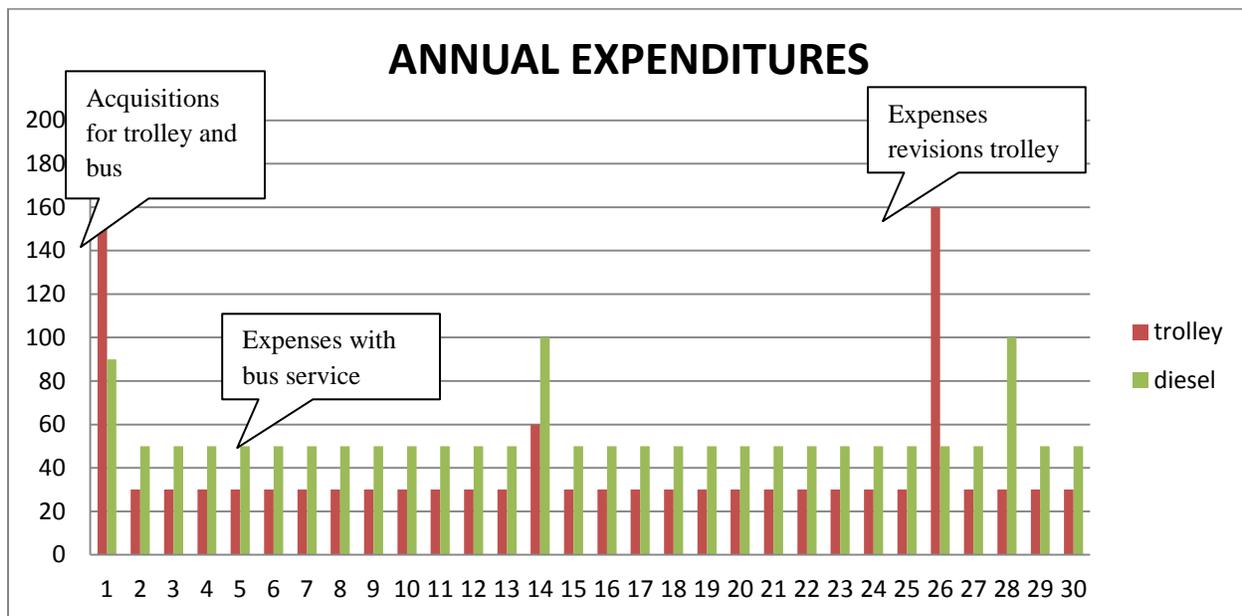
Figure 2.2: Operational expenditures for diesel buses, trolleybuses, trams and subway



Source: Schuchmann, A., New Horizons for Urban Traffic. Innovative Electric Bus Transit Systems, Session 6a: Energy and power supply. What do electric systems cost? Power Point presentation, 2013

In the figure 2.3. we will present annual expenditure during the entire lifecycle of a diesel bus and a trolley. It should be noted that throughout the life of the vehicle, even though the initial investment for a trolley is higher compared to a diesel bus, annual operating costs subsequently occurred are lower. Life time, energy costs in the country and usage have a strong impact.

Figure 2.3: Annual expenditure, throughout the lifecycle



Source: Schuchmann, A., New Horizons for Urban Traffic. Innovative Electric Bus Transit Systems, Session 6a: Energy and power supply. What do electric systems cost, Power Point presentation, 2013

III. The development plan for the public urban passenger transport

Passenger transport service planning is a cyclical and progressive process; the qualitative objectives are an expression of long-term goals. The qualitative objectives often describe a vision. To ensure that the assessment of what has been achieved is clear it is necessary to identify indicators - relevant quantitative values that enable measurement, calculation or at least description in concrete terms of the extent to which targets have been individually met [7]. Indicators are key figures for specific, important aspects of the quality objectives.

In order to implement a development plan the following objectives of public transport are essential:

- Promoting public transport:

- Availability of public transport in the municipality and in the urban region in terms of space and time;
- The competitiveness of public transport compared to private transport vehicles;
- Accessible and appropriately designed public transport stations;
- Environmentally friendly public transport;
- Protecting and promoting walk:
 - Dense and well-appointed network of sidewalks;
 - Quality of public spaces;
 - Safe, walking favorable environment;
- Protecting and promoting cycling:
 - Dense and well-appointed network of bike tracks;
 - Providing that most of the targets of interest in the city can be accessible for bikes;
 - Friendly environment for cycling;
- Health protection and conservation of resources:
 - Eliminating health risks and sleep disorders caused by traffic noise;
 - Eliminating health risks caused by air pollutants;
 - Eliminating injuries caused by traffic accidents;
 - Limiting the expansion of land supply for public transport to the minimum required;
 - Economic energy consumption and increasing the proportion of energy coming from renewable sources.

Indicators are needed to evaluate the mobility and development of transport, but require a differentiated use and, in many cases, an additional interpretation. They are intended to indicate the status, to illustrate the progress (or possible outages and failures) and to indicate advances or setbacks on the road to sustainable development.

Indicators developed within a plan for the development of public transport can be classified into three types:

- Quantifiable indicators oriented towards measures;
- Quantifiable indicators oriented towards impact;
- Non-quantifiable indicators oriented towards actions and projects.

Assessing the performance of urban public transport is analyzed by the following performance indicators of the system:

- ✓ The volume of passengers carried. A key indicator of productivity is the number of passengers transported depending on the number passengers transported daily by the means of transport;
- ✓ The use of vehicle fleet. The percentage of the fleet that can be put into circulation every day shows efficiency of supply and maintenance as well as the efficiency of the available personnel.

The quality indicators of the passenger transport service are:

- Reliability;
- Safety;
- Waiting time;
- Distances traveled by passengers to transport stations;
- Duration of travel;
- Interconnection between lines and services;
- Costs of travel.

Within a statistical survey, public transport users found that the most important factors influencing the quality of the transport system are reliability (70% of respondents considered it very important), availability of seating positions (64%), safety (60 %), personal safety (50%), walking and waiting time. These factors come long before the cost (20%) and the total length of travel (also 20% of respondents) [8].

IV. Conclusion

The economic, social and political progress of any state, community, region, nation or group depends on reducing the disadvantage and cost of conquering space. Please note that all activities of the contemporary man are related to transport. Strengthening transport macroeconomics was achieved through the cyclical development of the private economy with cycles of investments in transport, especially in the infrastructures of transport. In European cities, the negative impact of traffic causes economic damage worth 100 billion each year, corresponding to about 1% of the EU GDP. Such immense damage to the economy, people and the environment are partly due to decades of misunderstanding the concept of mobility - and the transport policy arising from it. The social need for mobility has been misunderstood as equivalent to improvement of infrastructure for automobiles. Urban sprawl makes public transport or alternatives to private car become less viable, creating a vicious circle.

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