

INTRODUCTION OF MODERN URBAN TRANSPORT SYSTEMS

Sedat Aruci¹, Feta Sinani², Pero Stefanovski³, Dean Brkoski⁴

¹⁾ *Universiti of Tetova, Faculty of Applied Sciences, Str. Ilinden, 1200 Tetova,
E-mail: sedat.aruci@unite.edu.mk and sedat.aruci@hotmail.com*

²⁾ *Universiti of Tetova, Faculty of Applied Sciences, Str. Ilinden, 1200 Tetova,
E-mail: feta.sinani@unite.edu.mk*

³⁾ *Universiti of Tetova, Faculty of Applied Sciences, Str. Ilinden, 1200 Tetova, and
American College Skopje (UAKS)
Treta Makedonska Brigada nr.60, 1000 Skopje
E-mail: stefanovski.pero@gmail.com*

⁴⁾ *Universiti of Tetova, Faculty of Applied Sciences, Str. Ilinden, 1200 Tetova,
E-mail: dean.brkoski@unite.edu.mk*

Abstract

Transportation has been an important element in the formation of life in cities since the appearance of the first cities. As the general socio-economic conditions and cities changed throughout history, so did the needs and conditions for transportation in cities. The relationship is two-way, as such a situation of organization of transport has greatly influenced the shape and form of organization of the city.

The way and type of organization of the transport system in urban areas depends on:

- Urban mobility: Ensuring the possibility of smooth, fast, safe, and efficient movement in the territory of the city and other urban environments, as well as from,
- Urban accessibility: Ensuring access to individual facilities and areas in the city and in other urban areas.

The purpose of this paper is to introduce a modern effective and efficient system of urban transport and its impact on increasing safety and reducing traffic congestion, especially for the preservation of an ecologically clean urban environment.

This paper will analyze the significance of the transport system in urban areas as well as its introduction and realization in all subsystems and segments in the traffic system throughout the cities and in other urban areas. Of great importance is the way of introducing or improving urban transport systems, as well as its effects, as well as finding an efficient way to implement the same.

At the end of this paper, we will have the conclusion where it will be determined how the existing urban transport systems should be introduced, perfected, or justified, as well as its effects, its impact on the reduction of traffic congestion, for the environmental and economic justification of reducing the number of traffic movements and accidents, as well as more relaxed traffic.

Keywords: transport systems, urban environments, systems, means of transport,

1 HISTORY OF URBAN PUBLIC TRANSPORT

In Europe, cities are also transforming the influence of the car, but this change has not been as drastic as in cities in the United States:

- European cities are old cities that have narrower streets and old buildings that do not allow the expansion of city thoroughfares,
- Some of these cities have retained public city transport, which has successfully cushioned the pressure from the cars.

Cities that have kept public city transport have managed to preserve a more humane urban environment:

- Strasbourg, France,

- London, WB,
- Amsterdam, Netherlands.

Cities that built a more balanced traffic system:

- increased awareness of environmental protection,
- civil movements for a more humane urban environment,
- the need to build a more balanced transport system that will include different types of transport, and will not rely predominantly on the car,
- walking, cycling, mopeds, taxis, various types of public city transport.

The history of these transport systems is made possible by the development of computer technology such as:

- All other elements (drive, route, materials, equipment) can be at an advanced level, but they were not a new concept,
- During the 1960s several interesting experiments,
- 0.6 km Times Square Shuttle along 42nd Street in New York – moving back and forth without a driver (Shuttle Automatic Motorman - SAM) soon caught fire and stopped working,
- 1962 to 1962 test of automatic streetcars in Erie, Pennsylvania,
- Pittsburgh from 1965 to 1967 installed an elevated test route of an automated SKYBUS vehicle with a capacity of 50 passengers. (1-mile track, 55 mph speed, 2-minute interval) Westinghouse Electric Corporation system,

Automatic water systems::

- During the 1970s after the descent of the moon,
- Several space equipment and defense companies have tried to find a market in civilian space,
- But designing a single-use rocket turned out to be a very different business from designing a public transportation system for everyday use and with limited funding,
- 1972 test track in California with MAGLEV technology

At several universities, the concept of PRT has been developed, but there is no application of:

- Successful GRTs in Vancouver and Scarborough (Toronto),
- GRTs appear in several cities in France and Japan (Lille, Kobe),
- However, there is no wide application of these systems.

Scenarios for the application of transportation in business and administrative centers (Downtown People Movers):

- The purpose of these systems is the transportation of employees and visitors in centers with high densities, from access points (metro stations, regional railways, bus terminals, parking garages) to the travel destination.
- It is usually about short trips, with vending machines.

2 BRIEF DESCRIPTION OF URBAN TRANSPORT SYSTEMS

When publishing the brief description of urban transport systems, some countries and cities that have built a more balanced transport system will be mentioned, which can be an example of how the urban transport system can be introduced in urban areas or settlements that need such transport systems.

2.1 *Brief description of the development of high-speed bus transport*

In addition, some examples of how fast bus transport was developed or implemented, which can be an example of urban passenger transport, will be listed, namely:

- 1937 plan for Chicago, BRT was first proposed in Chicago. The 1937 plan called for the conversion of three western high-speed rail lines into express bus service on major highways.
- 1956 – 1959 Washington DC plan. The highway BRT design studies were developed as part of the Mass Transportation Survey for the National Capital Region.
- In 1959, the plan for Saint Louis (St. Louis). The 1959 transport plan includes a 138 km long BRT system, of which 67.5 km are dedicated bus lanes. Here a road with three bus lanes approximately 11 m wide was made possible. The BAGP system cost a total of \$175 million.

A brief description of the USA is characterized by the appearance of roadways for buses only - BUSWAYS Shirley Memorial Highway (Shirley Memorial Highway) from the center of Washington to the southwest.

- Opened 1969,
- Long 20 km,
- Placed in the middle,
- Approaches and exits solved by ramps,
- Later demoted to HOV.

A brief description of the San Bernardino Freeway from downtown Los Angeles to the east.

- Opened 1972,
- Long 17,7 km,
- Placed in the middle,
- Approaches and exits solved by ramps,
- Later demoted to HOV.

A brief description of Runcorn, UK – first example of full application of a bus-only carriageway – 1964.

- New city,
- Long 19 km,
- In form of „8“,
- Periphery with a center,
- Planning goal – up to 500 m walking

A brief description of Curitiba – Brazil, the first real BRT.

- First line in 1974,
- First buses with 110 seats,
- Then double articulated with 270 seats,
- 10000 passengers/hour per lane.

3 CRITERIA FOR CHOOSING AN OPTIMAL URBAN TRANSPORT SYSTEM

The possibility of movement and transportation of goods – is very important for the functioning of the city, in modern cities the various functions in the city are located at greater distances from each other (housing, work, administrative services, shopping, recreation).

Transport is necessary for everyday life in the city, very important:

- Ensuring mobility and
- Ensuring accessibility.

A basic approach to perceive the needs of the inhabitants of the city, the needs of the city for its development and prosperity. The question arises, who are the people and what needs do they have? What do they want from the transport system of the city?

The transportation needs of city dwellers have changed throughout history. The demands that they set before the transport system have also changed. Today, higher and greater number of demands that the transport system has to satisfy.

The needs that are intended for mass transport, and transport service, predominantly with pre-defined routes, timetables, and cost of transport. In public transport, as a rule, larger vehicles are used, with an adapted design for faster circulation of a larger number of passengers entering and exiting the stands. The most famous types here are: the bus, tramway, high-speed tram, trolleybus, metro systems, regional railway and automatic guided systems.

There is an opinion in the public that technology is the most important (bus, tram, metro), but the quality of the service is a multidimensional characteristic!

Classification according to technology refers to the technical characteristics of vehicles and the road.

Types and classification of urban passenger traffic:

- Refers to the vertical contact between the vehicle and the surface on which it moves,
- Types and classification of urban passenger traffic,
- Urban traffic systems that are exclusively based on cars.

After the emergence of the need for the construction of an urban transportation system. This is a very difficult, specific problem! The solution depends on many factors:

- Economic development and prosperity,
- Historical development and current situation,
- Local geographical and climatic factors,
- Local mentality and needs of people, etc.

Goals for the development of the city and its transport system, depending on the existing development policy, but also the commitment and ability to implement the outlined policy for the realization of such specific systems.

As a possible solution, the following necessary elements or factors that depend on the implementation of the urban transport system in a certain urban environment for the transport of passengers as well as the transport of goods according to the needs of the urban environment, for the implementation of all this is necessary:

- To look for adequate solutions for the problems that arise in urban areas for the transportation of passengers, solutions that are related to the modern world such as Europe, America and other Asian countries that have developed in this direction such as: Japan, China and other developed countries,
- Concept of sustainability and quality of living in settlements, for more effective and efficient organization of urban public transportation, also to take into account the protection of the environment,
- The car is no longer "his majesty", city spaces are returning to people
- Changing the philosophy of urban planning
- Concept of sustainability and quality of life

Today, new concepts are emerging:

- Sustainable development (to develop a transport system that would have the least negative impact on the environment and, if possible, would not threaten the renewal of natural resources),
- Quality of life (overall parameters for evaluating the quality of life in the city: economic, social, cultural, political)

4 SOME RECOMMENDATIONS FOR BUILDING AN OPTIMAL URBAN TRANSPORT SYSTEM

Part of the requirements for building an optimal urban system, which can arise from different categories of users of the urban transport system, can be opposed to each other.

Different categories of users have different criteria and requirements, the criteria may change over time and according to the type of user interests that may arise and may be:

- Who are the users and their needs,
- The most important thing is to perceive what are the needs of the users for transportation, against the characteristics and capacity of each of the available types of transportation in the city. For certain journeys, specific types of transport are most suitable, for specific groups of users,
- Required capacity of requests,
- Different transport systems allow different capacities and level of service,
- The proposed types should cover the demand for transportation in the city,
- Availability of the transport service in time and space,
- The various users should have available the possibility of transportation to the desired destination in the space and time when it is necessary to make the trip,
- Speed – transport time,
- The transport system should ensure the execution of the transport in an acceptable time. Residents of cities who need transportation every day are especially sensitive to this,
- Reliability of the transport service,
- The transportation system should provide a high level of reliability that will allow users to plan their time. Delays, cancellations of transportation have an extremely bad impact on the quality of life in the city,
- Safety in traffic and from crime,
- The transportation system should ensure safe transportation, that is, human health and life should not be endangered,
- Elements of comfort,
- People who already live in a relatively comfortable home and work environment will not accept low standards during travel. Heating, cooling, availability of seats, easy entry and exit into the vehicle, available information, hygiene, courtesy of the transport staff, etc. are also important elements of the transportation system,
- Environmental protection and energy saving – construction of a sustainable transport system,
- Today, more and more importance is attached to this element – the development of sustainable urban transport systems,
- Costs –capital and operational, a very important elements when building a transport system – The high costs of building certain types can be a limitation and affect the choice of solutions. The costs of operation and maintenance of the system are also important for the sustainability of the urban transport system.

CONCLUSION

Despite the great initial expectations from this type of public transport, today there are few such systems as systems that play a significant role in the transportation of passengers in cities. These systems exist in the form of transportation in specific units (airports, shopping centers, amusement parks etc.).

Increased awareness of environmental protection, as well as civil movements for a more humane urban environment, there is a need to build a more balanced transport system that will include different types of transport, and will not rely predominantly on the car, walking, bicycle, mopeds, taxis, as and other different types of public city transport.

When analyzing the need for the introduction of urban transport systems, the dilemma and questions arise:

- How to build an optimal urban transport system, which is a very difficult problem! The solution depends on many factors: Economic development and prosperity, historical development and existing conditions, local geographical and climatic factors, local mentality and needs of people, etc. Goals for the development of the city and its transport system – depending on the existing development policy, but also the commitment and ability to implement the outlined policy.
- And how and what is the solution, to look for adequate solutions for the problems that appear in urban areas for the transportation of passengers, solutions that are related to the modern world such as Europe, America and some Asian countries that have developed in this direction such as: Japan, China and other developed countries.

The concept of sustainability and quality of life in settlements or urban environments, for a more effective and efficient organization of urban public transportation of passengers, also considers the protection of the environment from exhaust gases or other types of pollutants, which is very important for the normal healthy life of the population in those environments where such or similar transportation systems are planned to be introduced.

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