ANALYSIS OF PUBLIC TRANSPORT INFORMATION, EXAMPLE FOR THE CITY OF BITOLA

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Abstract

Public transportation aims to transport passengers from one point to another, that is, to cover the territory of the urban area with its services. Quality, well-designed transport systems are fast, comfortable, affordable, and most importantly, accessible. Transport systems have the power to ensure access to urban opportunities, including leisure activities, productive work, and public facilities. Currently, a major challenge is to prioritize public city transport investment. In this context, new vehicle technologies should be used to enhance the public transport system, making it more accessible and energy-efficient. But in order to fulfill the aforementioned, the information related to the services offered by public city transport, from information on timetables, tickets, in the vehicle itself, etc., is of great importance. It is the information that is the goal of this paper, of an already prepared survey on the territory of the city of Bitola.

Keywords: information, public transport, survey, users, Bitola.

Introduction

Access to safe, modern public transport provides a true alternative to private vehicle ownership, which is a major source of socioeconomic disparity and a massive contributor to climate change in cities all over the world. Transportation is the fastest-growing source of global climate emissions and the largest single source of black carbon, which is particularly damaging to respiratory health, from gas and diesel engines. Shifting from single-occupancy private cars to high-capacity, zero emissions transport corridors would drastically cut emissions, eliminate traffic congestion, and better connect low-income communities to the opportunities and resources they need.

To make public transport an attractive and everyday choice for residents, cities must design the service well, and overcome physical and cultural barriers. High quality public transport services are reliable, frequent, fast, comfortable, accessible, convenient, affordable and safe, serving routes for which there is demand.

A significant component of public transportation systems is information itself, which is actually the main source that facilitates people in accessing such services. As urban cities thrive toward creating more modern, easily accessible, and better transportation services, the urge to convey information on such services more effectively is becoming a necessary aspect to maintain and improve functionality of public transportation means i.e. buses, railroads, shuttles, etc. and beyond that, is its high potential to affect a country's economic activity and growth.

Information about public city transportation

Public transport companies and public transport authorities achieve a better image when providing real-time information and when using innovative information systems in their communication with the users, resulting in higher customer satisfaction. The possibility of higher income might be a long-term benefit when the measures result in higher demand for public transport.

Information is a powerful tool to enhance the perceived service quality of public transport.

Accurate and instantaneous information regarding vehicle arrival times, route congestion, and delays empowers passengers to make informed decisions about their commutes, including adjusting routes based on departure and arrival times. Smart parking apps can guide drivers to available spots, eliminating the time wasted on circling city blocks.

In order to use public city passenger transport, the public must be informed about where and when public city transport services can be used. That is why the information system is a very important element of the transport service. Ignoring passenger information can be one of the important factors contributing to the reduction of the volume of transported passengers and the poor financial condition of public city transport companies.

The underestimation of the importance for the careful planning of the passenger information system is mainly caused by the ignorance of the real needs of the public and the behavior of the passengers.

The term "information system" implies the

existence of several elements that complement each other in the provision of information to the public about the public city transports system. These elements should be well planned and coordinated by content and place of distribution. Only a well-designed system can provide necessary information for each segment of the public.

When planning the information system in public city transportation, three basic questions should be analyzed:

1. What categories of people use public city transportation?
2. What information do they need when they use public transport?
3. How can this information be best delivered to them?

Public city transports users

The users of public city transport in terms of their need for information can be divided into four main categories:

- Regular users of the usual line (every day going to work, to school using the same line);
- Regular users of the non-ordinary line (regular users who travel in parts of the city where more than once);
- Occasional users (users who know the city, but occasionally use public city transport);
- Visitors to the city (users who come from outside the city and do not know the city and the public city transports system).

Regular users of the usual line need little information. You only need to inform yourself about possible changes to the driving schedule, route or parking.

Regular users who pay for lines they do not use regularly need more information. Since these users are familiar with the public city transports system (payment system, ticket price, etc.), they need information about the bus schedule, routes and stations on the lines they do not use regularly.

In addition to the information covered in the first two groups, users of the third category need information about the price of the tickets, the structure of the tickets, etc.

Most of the information should be prepared for the visitors of the city who need complete information about the public city transports system and the city.

For each category of users, it is necessary to analyze what kind of information to provide, in what form and where.

Form, methods and place of information

The information that I have for users can mainly be in the form of:

- Map of the public city transport line network and location of the stops/stations;
- Timetables;
- Information on ticket prices and payment system;
- Methods and places of transfer between public city transports lines.

The ways in which this information is delivered to users include:

- Signs, markings and special symbols;
- Brochures pamphlets;
- Display;
- Telephone;
- Daily press;
- Internet
- Radio and local television.

The location where this information will be made available may be:

- Public city transports stands/stations;
- Vehicles of Public city transport;
- Terminus of Public city transport;
- Transportation hubs (intercity railway and bus stations);
- Important public places and buildings (shopping malls, administrative buildings, city center, etc.);
- User's home.

Information on stations/stations

A fundamental priority when designing the stands is their clear marking, because people must know where the public city transports service is so that they can use it. That's why all the stands should be marked in an easily visible way, if possible with the same design elements throughout the city, to make them easily recognizable. This is achieved with a careful selection of signs, road markings and other design features such as specially designed shelters (overhangs) and street modes of transportation.

Means with which the stand is marked, the following information is included:

- Logo of the public city transports system;
- Marking of the route (number, letter or other)
- Name of the public city transport company,
- Telephone number of the information center of public city transport,
- Stand name,
- Direction of vehicles,
- Map with all lines and stands, main stands, mark where the person is at the moment.

A well-marked stop, with a striking color, is easily recognizable. Road markings help in recognizing the stop, the road marking "BUS" will help reduce illegal parking of vehicles in that place. This is shown in figure 1.

Figure 1. Information required at the stand

Information in public transport vehicles

Vehicles, in addition to providing transportation, should also provide information for both passengers in the vehicle and for waiting passengers.

The following information must be provided on the outside of the vehicles:

- the number of the line and the starting and ending stops, which should be displayed on the front and right side of the vehicle;
- the logo and name of the carrier on the vehicle's side;
- the telephone number for information at the Public Transport Office.

A practical way of changing the information about the line, even if the vehicle has changed lines, is to use a metal board that can be changed or, more recently, to use a digital display that is already built into the vehicles on the front. top side and/or on the right side.

At that time, the following information should be provided on the vehicle:

- a map of the line with the location of the most important stops should be displayed;
- new timetables and maps should be available.

This is shown in figure 2.

Figure 2. Information in public transport vehicles

Public city transport in Bitola

Public transport in Bitola is carried out by 5 licensed private operators and 5 urban circular lines.

In order to be able to perceive the needs and shortcomings faced by the citizens of the city of Bitola, the simplest way is to do it using a survey. In an immediate tour of the lines of the public city transport, we first visually perceived the shortcomings, and then noted the answers on paper from the side.

To the question whether public city transport stops are well marked, provided and whether they have the necessary information. A very small percentage think they are, that is 21.3%, while the rest think they are not or partially 78.7%. This is shown in Table 1.

Table 1. Are stands well signposted, weatherproof and have the necessary information

Are stands well signposted, weatherproof and have the necessary information			
		Frequency	Percent
Valid	Yes	67	21,3
	No	110	34,9
	Partially	138	43,8
	Total	315	100,0

We can see that from the next photo 3, where the stand itself does not have any information about the timetable, only the number of the stand, we have no road markings.

Figure 3. Bus stop of public city transport in Bitola

Given that the stops do not have information about the timetable, only electronically published on their website, we can note that this negatively affects the next question from which we can conclude that users of public transport services most often know the timetable of the line on which they most often travel, namely 114 or 36.2%, those who do not know the timetable and who believe that more modern methods of information should be introduced are almost similar or around 18%, while 25.7% of the survey respondents know the timetable of the public transport lines in Bitola.

The city lacks a modern way of informing passengers about the timetable, departure time, arrival time, where the vehicle is, how long it will take to arrive, etc.

As for example in picture 4 electronic modern way, on the display on the stands themselves, where the vehicle is tracked in real time.

Figure 4. A modern way of informing users about the timetable

Table.2 Analysis of the information about the bus schedule in Bitola

Are you, as users of the public transport service, sufficiently informed about the timetable?			
		Frequency	Percent
Valid	Yes	81	25,7
	No	58	18,4
	I know the timetable only for the line that I travel on frequently	114	36,2
	It is necessary to introduce more modern ways so that they would be better informed	62	19,7
	Total	315	100,0

Regarding the marking and necessary information that public transport vehicles have, we can conclude that Bitola has an old fleet, damaged vehicles, no ramps for people with disabilities, no timetable information, display boards, and outdated means of ticket collection. A public city transport vehicle in Bitola is shown in figure 5.

Figure 5. Public city transport vehicle in Bitola

Conclusion

Public transport provides personal mobility and freedom for people and is crucial to the accessibility of any city. The use of public transport should be every day, the city's culture and habit of using public transport, as an alternative to personal cars, is a characteristic and is a function of the general and common interest for all.

The adoption of digital technologies in the public transport sector is rapidly increasing worldwide. This includes the implementation of high-capacity transit communication networks that enable connected vehicles, smart stations, and data-driven transit operations. These networks facilitate intelligent applications that enhance the efficiency, affordability, and safety of public transport for both operators and passengers.

By improving the information on the public transport system, public transport can develop as a real alternative to private car use. An increased use of public transport can reduce congestion and local climate issues. By providing integrated information intermodality can also be supported. Furthermore, better information results in substantial time savings for current public transport customers because of the possibility of improved planning and intermodality.

All information should be available in a barrierfree format ensuring that those who are less computer literate, people with special needs, the elderly and visual impaired and deaf persons have access to the information needed.

We can conclude that based on the conducted survey, the organization and application of the services of public city transport in Bitola are at an unsatisfactory level. Outdated timetable, insufficient information of the users, lack of information in real time, delay of the vehicles, old vehicle fleet, damaged parking lots without the necessary information. The results of this survey should direct us to the introduction of new measures, new modern ways of functioning of the transport, so that we have a greater attraction for passengers.

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