HOW TO BETTER THE QUALITY OF PUBLIC CITY TRANSPORT

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Abstract: The organization and operation of public transport, characteristic as a form of transport. Especially in larger cities organization it is imposed as a necessity from several aspects. One of the most effective ways, if not for a complete solution, is the reduction of the number of vehicle units that participate in traffic in a certain period of time. Of the practically applicable and efficient ways to mitigate this situation, the organization and functioning of public transportation can be singled out, which with its potential can provide an optimal urban transportation system. Bitola is a city that owns public transportation of passengers, in order to understand the problems, a survey was conducted to analyse the quality of the services offered by it. This paper will show the collected and processed data from the survey on public city transport in Bitola, on the quality of transport and ways to improve it.

Key words: quality, public transport, survey.

1. PUBLIC TRANSPORTATION

Public city transport is of great importance for big cities and its correct organization and functioning. Public transport is necessary due to the increasingly pronounced problems in cities, heavy traffic, overloaded roads, loss of time, risk, lack of parking space, air pollution and noise. The main generator of these problems is that too many trips in the City are made by passenger cars, which require a large area for movement and parking. For those reasons, one of the most effective ways, if not for a complete solution, then for a significant mitigation of the problems, is certainly the reduction of the number of vehicle units that participate in traffic in a certain period of time. Of the practically applicable and efficient ways to mitigate this situation, the organization and functioning of public transportation can be singled out, which with its potential can provide an optimal urban transportation system.

A 'good' public transport system for today's world is one where a person can safely and reliably reach as many (or more) places as quickly by public transport as they could by private car or motorcycle. Good public transport also prioritizes the needs of people who have been historically marginalized or who have the fewest mobility options, particularly women, children, people with low incomes, and people with disabilities. Good public transport must have several essential qualities:

Connective: A comprehensive network of frequent service, including during off-peak and weekend hours, means short wait times between public transport services, leading to shorter trips and service to nearly all parts of the city.

Convenient: When public transport is accessible to all, people with disabilities, older people, women, and people traveling with children or goods can use the system.

Consistent: Better reliability means the times between public transport services are more consistent, reducing waits and improving the ability of people to reach destinations.

Comfortable: Safe services are operated in a way that avoids crashes, especially with vulnerable road users, like people walking and cycling.

Cost-effective: Affordable fares are set so almost everyone can afford to use the service regularly, with little to no additional cost for using multiple modes in a trip.

Customer-friendly: The easier a system is to understand and navigate, the more people can use it to move quickly around their city.

Clean: Services that emit little to no pollution may lower barriers to expanding public transport and improve passenger experience by reducing air and noise pollution.

1.1. Public transportation in Bitola

High-quality public transport services are reliable, frequent, fast, comfortable, affordable and safe, serving routes in demand. Successful public transport is essential to any emissions reduction strategy in the transport sector. It is a public good, which provides benefits for transport efficiency, pollution reduction, local and national economy and social inclusion.
As in Bitola, as in many cities, bus networks are inefficient, overlapping, irregular, and have difficult to read route maps, unbalanced coverage of the city and different tact. This is frequently due to their organic historical expansion. However, these systems are widely used and have huge potential. Bitola is a city that is suffocated in traffic chaos and air pollution. Although attempts have been made to solve this problem in the past period, traffic congestion remains a serious problem, as does the lack of traffic culture. Transportation in Bitola is carried out by 5 licensed private operators and is represented by 5 urban circular routes. Therefore, the current situation is characterized by an unstable service of public transport. Namely, using only a circular network, the frequent service is provided only in one part or in this case only in the central area of the city. Precisely because of this, the purpose of this paper is to conduct a survey of the users of the public transport service and to determine what is the quality offered by the transporters.

2. IMPLEMENTATION OF THE SURVEY ON THE QUALITY OF PUBLIC TRANSPORTATION SERVICE

In the period from 01.21.2023 - 03.11.2023, an electronic survey was conducted for all users of public city transport in Bitola. The survey was made on the Google Drive - Google Forms platform. 30 questions were created where the situation with public city transport was analyzed from multiple aspects, including all stakeholders. Some of the questions refer to the current situation, the problems and what is the quality of the transportation. While on

06.03.2023 a survey was conducted in a vehicle of public city transport and facing the problems and shortcomings face to face.

The whole world is striving towards the introduction of sustainable urban transport, all with the aim of solving the problems of motorization. The introduction of public city transport that will offer a quality service, with a very small area for movement and stopping, will transport a huge number of passengers, and therefore high mobility of the population and accessibility to all city functions. This results in the possibility of turning the city into a pleasant place to live, with more areas intended for greenery, housing, cultural facilities, sports grounds, and production facilities. But we are all witnesses of not so good implementation and functioning of public transportation. Problems with the quality of the provided service, holding the bus stop for too long due to the collection of tickets, insufficient marking of the bus stops and timetable information, buses whose services do not meet the needs of people with disabilities, reduced safety, frequent breakdowns and accidents such as and reduced frequency, are the frequent problems faced by the users of the public transport services in Bitola.

3. RESULTS

148 respondents took part in the electoral survey, while 167 users of the service were surveyed in a vehicle of public city transport. The data were processed and graphed.

From the previously conducted survey and published paper, we can conclude that most of the respondents are people up to 18 years of age, they use public transportation to go to school, a family of four with mostly one car.

In addition, some of the questions related to the quality of the service offered by the public city transport in Bitola.

When asked what is the quality of public city transport services, 56.5% answered that it is good, a very small percentage consider it to be excellent and very good, while 54 respondents or 17.1 consider that the services are bad, and 5.4% very bad.

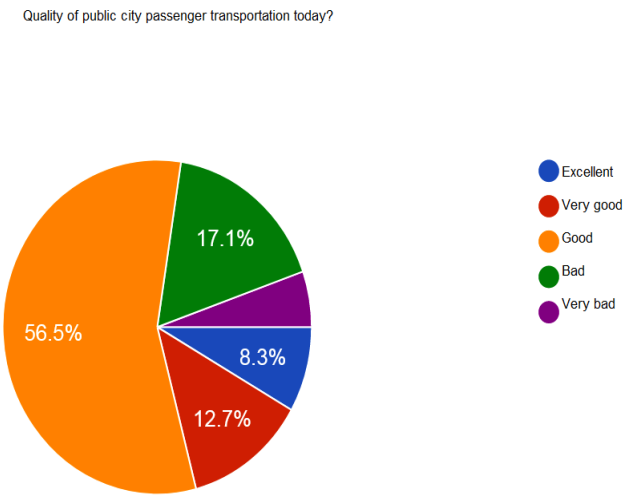

Figure 1: Quality of public city passenger transportation today

When asked if they would use public city transport more if the services were improved, i.e. greater reliability, more comfort, new vehicles, more lines, 43.8% would use public transport more, while 33.7% would use it at the same level as now.

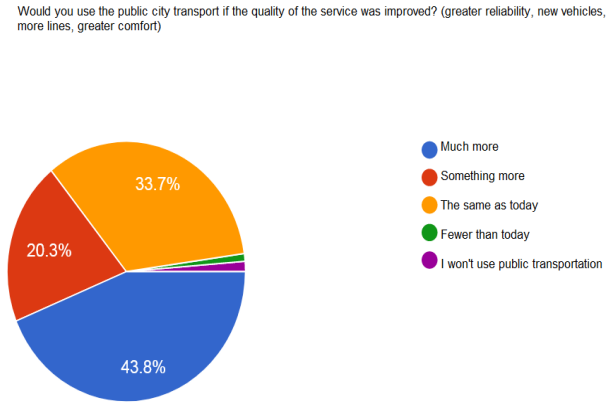

Figure 2: Would you the public city transport if the quality of the service was improved

When it comes to the reasons why they don't use public transport services, they are numerous. Such as poor hygiene, irregular timetables, crowds, long drives, high ticket prices, insufficient information, etc. The biggest reason they don't use is the bad and irregular timetable, ie 28.6%, around 22% don't use it because of too much crowd and lack of information, 5.1% think that the ticket price is high and that's why they don't use the services.

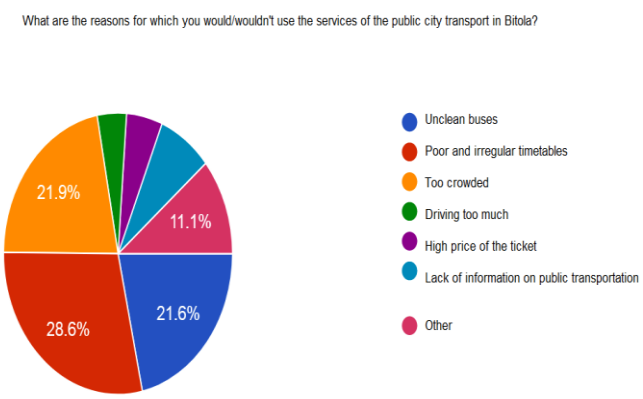

Figure 3: What are the reasons for which you would/wouldn't use the services of the public city transport in Bitola?

The territory of the city of Bitola is served by 5 urban circular lines, when asked whether the number of lines is sufficient, the largest number of respondents believe that it is necessary to introduce other lines of public city transport, 37.8%, while 32.4% think that they are not enough. while 29.5% are sufficient and meet their needs.

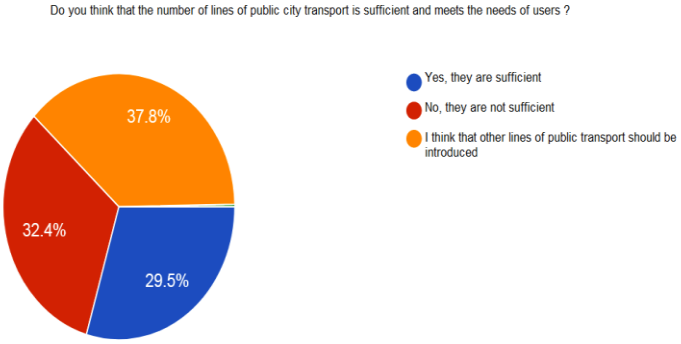

Figure 4: Do you think that the number of lines of public city transport is sufficient and meets the needs of users?

Public city transport vehicles must stop at the entry and exit stands for passengers, that is, ticket collection. Regarding payment, the passengers think that the vehicles do not stop at the stands much, 56.5%, while 43.5% think that they do. While on the question of introducing a modern system, they believe that the time will be shortened and thus the goal will be reached faster.

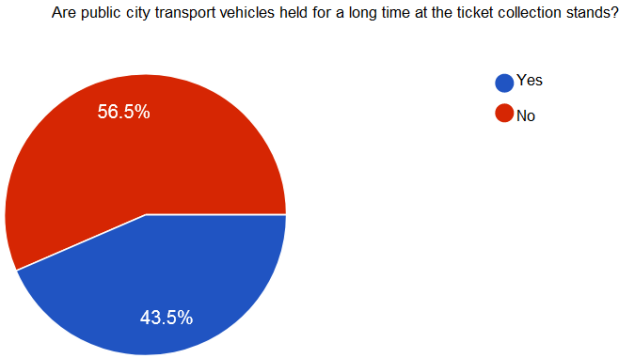

Figure 5: Are public city transport vehicles held for a long time at the ticket collection stands?

Information is of great importance for quality public transportation, whether it will be at the bus stop, in the vehicles or on the vehicles themselves, on an Internet platform. Most of the time, passengers only know the timetable of the line on which they most often travel, and that is 36.2%, respondents who do not know the timetable and who believe that modern ways of information should be introduced are about 20%, while 25.7% know it the time schedule.

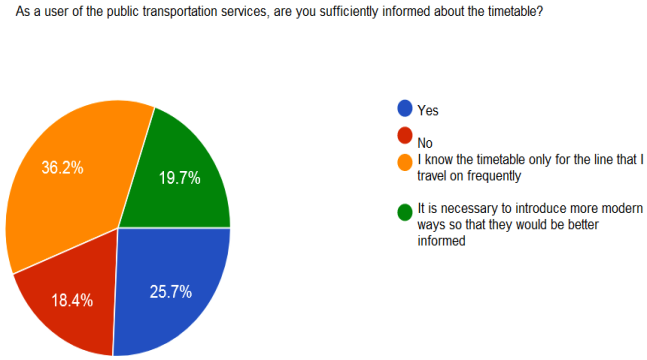

Figure 6: As a user of the public transportation services, are you sufficiently informed about the timetable?

Safety is a crucial factor. When asked what the safety is like in public city transport vehicles in Bitola, 64% answered that it is at a sufficient level, that is, they never once felt threatened.

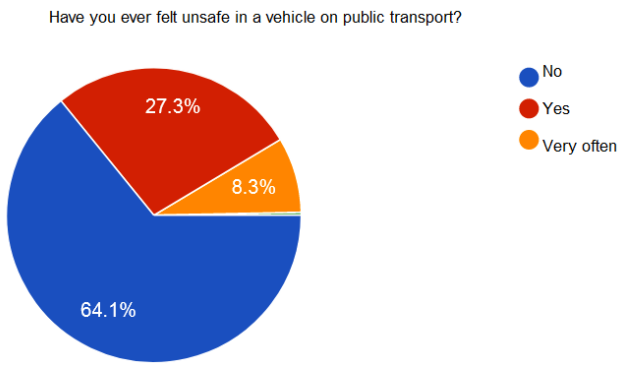

Figure 7: Have you ever felt unsafe in a vehicle on public transport?

When it comes to the frequency of vehicles on public city transport, respondents believe that the frequency of vehicles on public city transport should be increased, 45.4%, and that they do not operate with sufficient frequency 24.4%.

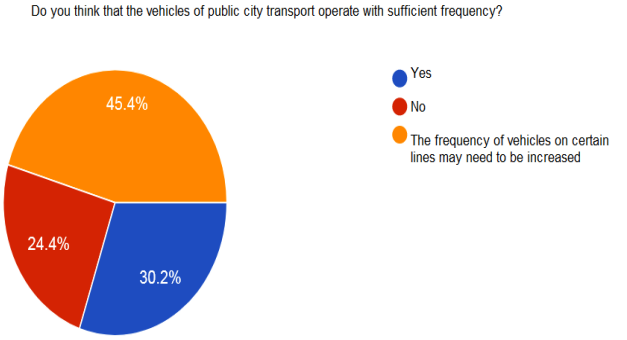

Figure 8: Do you think that the vehicles of public city transport operate with sufficient frequency?

Public city transport should be transport available to all citizens equally. But this is not the case with disabled people who are often denied the opportunity to use public transportation services. Because the vehicles are not sufficiently equipped with a special space inside the vehicle, with a moving ramp, holders, audio and visual aids that will help people with sight and hearing impairments, how they know the timetable, or which vehicle arrives at the stop. The conducted survey also shows that the vehicles of public city transport do not meet the needs of users with certain disabilities 50%, partially 39%.

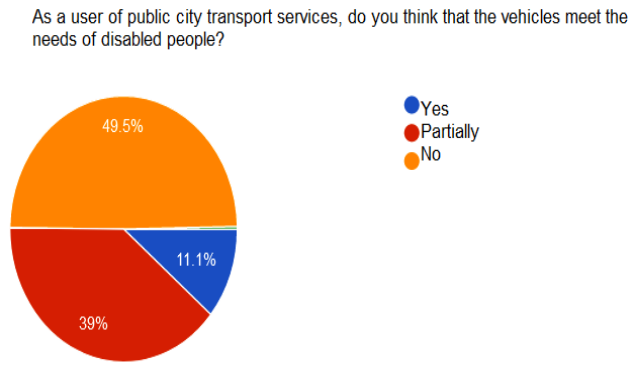

Figure 9: As a user of public city transport services, do you think that the vehicles meet the needs of disabled people?

We often witness damaged bus stops, lack of an information block, insufficient protection from bad weather conditions, rain, sun, they are not illuminated and placed in unsafe locations. There is a huge percentage of respondents who believe that the bus stops are not safe, are not well marked and do not have the necessary information, i.e. partially, 78.6%.

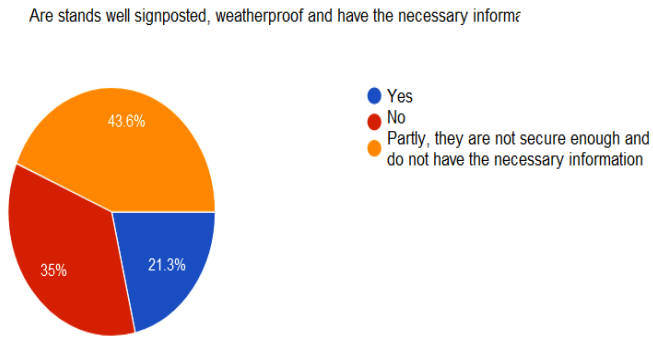

Figure 10: Are stands well signposted, weatherproof and have the necessary information

4. DISCUSSION

From the conducted survey we can conclude that the quality of the services offered by the public city transport in Bitola is not at a satisfactory level, the citizens are facing serious problems from the following fields:

- The vehicles (small number of buses, poor hygiene, old fleet that often breaks down, loud noise, harmful emissions, small number of seats, air conditioning, too crowded, they are not low-floor, which makes it difficult for the elderly and people disabled, small children, bad smell)

- Timetable (frequent delays, the timetable is not followed, a small number of lines, canceled, no

transport in the late hours, certain stops are skipped, low frequency of vehicles)

- Billing (student billing, high ticket price, bad billing system, manual billing)

- Information (non-existence of a system to inform passengers that the public city transport vehicle will be late, will not come at all, there is no button in the public city transport vehicle with which the passenger would inform the driver that there are passengers to exit at the next stop)

- Security (due to illegal parking, passengers enter/exit outside the parking lot, as their security is at a low level)

Some of the problems mentioned by the surveyed users of the public city transport in Bitola:

- "Old, worn-out and non-uniform buses. Non air-conditioned buses. Insufficient number of low-platform buses (stopping at the entrance of elderly people and parents with children, as well as people with disabilities), poor payment system (hand to hand in cash), insufficient visibility of timetables, poor information, insufficient promptness of the traffic police, regarding the clearing of the so-called wild taxi drivers around bus stops, with buses stopping in front/behind the stops and passengers running to get in/out and their safety being threatened by other vehicles. And of course, non-ecological buses."

- "There are no buses during the weekend, the buses come very early or are very late at the bus stops, and sometimes they may not come at all, the last bus is at 7:00 p.m., so I am forced to ask the teachers to let me out of school earlier to I'm getting the bus."

- "Bad hygiene, I rarely use it because it's not clean, there's too much crowd, different vegetables, bad smell."

- "Sometimes I'm late for school because the transportation is late, there's not enough space, it's always crowded, the buses aren't clean, they don't always go to the stops they should."

5. PROPOSED MEASURES FOR IMPROVING THE QUALITY OF PUBLIC CITY TRANSPORT

1. Widening and simplifying the public transport network, e.g. by
• Redesigning the network layout,
• Enhancing the frequency and operating hours,
• Introducing Demand-Responsive Transport (DRT), which is a public transport service operated on demand only, e.g. passengers call the bus by phone.

2. Modernising the infrastructure (especially at intermodal interchanges) and making the entire voyage by public transport more comfortable, e.g. by
• Installing high quality waiting facilities (seats, shelters, convenience services).
• Building secure bicycle stands, park and ride facilities, car sharing facilities, etc.
• Easing access to stations (e.g. pedestrian and bicycle paths, signs, redesign of surrounding space).

3. Enhancing the accessibility for all persons, especially for people with special needs, e.g. by
• Implementing different information tools that are adapted to people with disabilities (e.g. visual aid systems, vocal announcements)
• Ensuring the physical accessibility of waiting facilities and vehicles (e.g. for prams, pushchairs, wheelchairs, walking frames).

As in Bitola, as in many cities, the bus networks are inefficient, overlapping, irregular, have hard-to-read route maps, unbalanced coverage of the city, and different tactility. This is often due to their organic historical expansion. However, these systems are widely used and have huge potential.

Cities like Seattle, Houston, Barcelona and São Paulo have successfully invested in redesigning their networks and improving service standards by:

-Optimizing bus routes to minimize overlap and ensure demand-driven coverage across the city. Houston re-positioned bus service after light rail was established to reduce the overlap of these services and provide transit coverage to other areas of the city.

-Intuitive network design and easy to read bus map. Provision of high-frequency and reliable services.

-The bus network can be divided into main lines and local lines, with different frequencies but with the highest 15-minute punctuality on long-distance main lines.

-Building regular bus stops for easy access. In Barcelona, the maximum distance between transit stops in the new bus network is 350 meters. In Seattle, bus network upgrade plan will increase percentage of households within 800 meters.

Figure 11: Public transport in Barcelona

The public transportation system in Tokyo, Japan may seem a little complex at first glance, but that is because it is one of the most extensive urban rail systems of any country. It serves an estimated 3.5 billion people a year, more than any other on Earth. Everything is super fast, super efficient, super clean, and it prides itself on being one of the most punctual systems in the world. You can get almost anywhere in the city by train, with stations everywhere. There are several different companies that own different transportation lines, and two specifically for the metro system. Fortunately, there are re-loadable cards that you can use on any train or bus, regardless of which company operates it. Two great options are the Suica card or the Pasmo, both of which work not only in Tokyo but in major cities across Japan.

Figure 12: Public transport in Tokyo, Japan

6. CONCLUSION

Public city transport is of great importance for pollution reduction, local and national economy and social inclusion. High-quality public transport services are reliable, frequent, fast, comfortable, affordable and safe, serving routes in demand. The more the system can improve these qualities, the better support it can provide for its occupants. Public transport planning decisions are certainly never simple. Every city's transportation system has unique strengths, weaknesses, and concerns, and every project and policy come with benefits and costs that must be considered in the local context. There is no universal path forward. However, good public transportation will always be key to a well-functioning city, and the characteristics of good public transportation are universal.

In this paper, the output results of the survey conducted at the level of the city of Bitola, Macedonia were shown. From the survey, we can conclude that it is necessary to invest more in the city transport in order to have a greater demand, because it has an old fleet, lack of information about timetables, low frequency, the number of lines do not meet the needs, the bus stops are old and damaged, vehicles are delayed, and the billing system is old and time consuming. If certain measures are not applied and practices from around the world are not followed, public transport will remain at the bottom of the pyramid for choosing a means of transport for traveling from point to point.

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