

Advancement of public transport service in the Bitola town

Nikola Krstanoski ¹, Vaska Atanasova ², Beti Angelevska ³

¹Full professor, Faculty of Technical Sciences, Makedonska falanga 33, Bitola, Macedonia
(nikola.krstanoski@tfb.uklo.edu.mk)

²Associate professor, Faculty of Technical Sciences, Makedonska falanga 33, Bitola, Macedonia
(vaska.atanasova@tfb.uklo.edu.mk)

³Assistant professor, Faculty of Technical Sciences, Makedonska falanga 33, Bitola, Macedonia
(beti.angelevska@tfb.uklo.edu.mk)

Abstract – Considering that public transport should provide availability, timeliness, convenience and effectiveness in service offered, concrete solutions for optimization of the public transport service in the town of Bitola, Republic of Macedonia, are proposed. These proposed solutions, i.e., two new public transport lines, connecting suburban areas with the town's centre are projected to cover the entire territory of the town. Their implementation will provide regular, frequent and price competitive, well connected public transport network. By implementing these solutions public transport will have a possibility to become a part of the modern qualitative way of urban life, and thus to contribute for sustainability in urban transport.

Keywords – Public transport, lines, service.

1. Introduction

The promotion of public transport as a backbone of urban mobility, or at least as an alternative to the dominance of the automobile, has become a prominent policy focus in most cities around the world. However, while some cities have been successful in shifting car journeys onto public transport, others are struggling despite considerable effort to make public transport more attractive [1]. Between last ones, Bitola town could be included.

Public transport is particularly important part of the sustainable urban transport system [2]. But, public transport attractiveness depends of the quality of service offered at entire territory of the urban area. The current situation with the public transport in the town of Bitola is very difficult because its problems were neglected and ignored for a very long period. This attitude toward public transport has resulted with degradation of service quality, decrease of the number of users, aging of the fleet vehicles, financial exhaustion of the operators and with their unavailability for investments and advancement of the service [3]. All these reasons, and especially the absence of any kind of support from the state and local authorities, contributed for the present situation. Therefore, the public transport service is far behind

compared even with public transport service available for the citizens in macedonian capital city.

This situation imposes the necessary need for in-time and organized resolving of the public transport problems that obstruct its functioning. Therefore, in this paper, at first, a current situation in the public transport in the Bitola town is presented, identifying operational problems and problems with service quality. Then, as a solution, two new lines of public transport are proposed, in order to contribute for the expansion of its service at the whole urban area. Implementation of proposed lines has potential to overcome problems that characterize current situation. Hence, the needs of the citizens for available, convenient, safe and environmental clean transport in the town can be solved with qualitative public transport, which will provide effective high capacity transport and competitiveness in price.

The purpose of these proposed solutions is directed as a support to the fact that **public transport has the greatest potential** for solving the transport problems in urban areas [4]. At the same time, public transport represents a key factor for achievement and realization of economical, ecological and social aims [5].

This priority in promotion of public transport contributes for its involvement in the initiatives for sustainable mobility, making the private car to be a second choice. In that way, public transport will accentuate itself as a key component in the policies for sustainable urban transport, contributing for the decrease of life quality degradation [6].

2. Public transport in the Bitola town - current situation and problems

2.1. Analysis of the current situation

Public transport in Bitola town is performed by nine licensed private operators. The current public transport service in the urban area of the town is presented with four urban lines (figure 1).

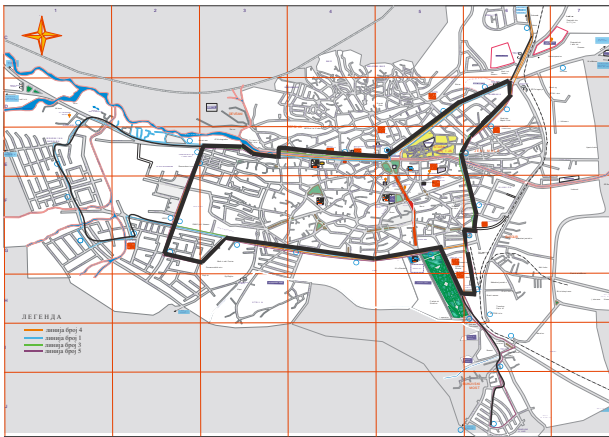


Figure 1. Current lines in the public transport

As can be seen from figure 1, public transport in Bitola town is performed only by round lines. As a consequence, the current situation is characterized with unsteady service of public transport. Namely, using only round lines network, a frequent service only in one part, or in this case only in central area of the town, is provided.

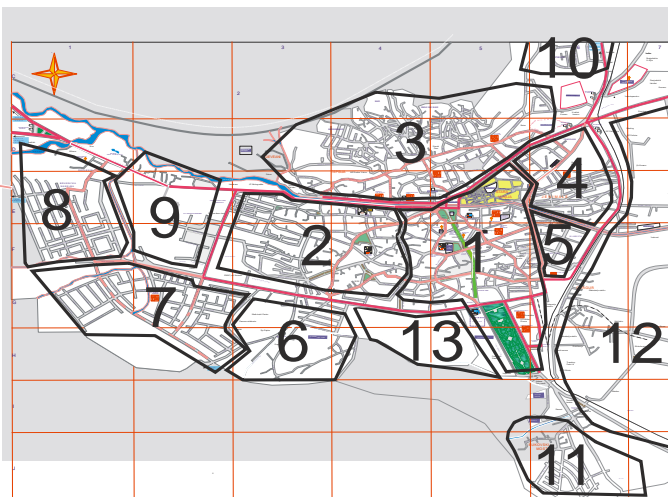


Figure 2. Traffic zones in the town of Bitola (total of 13 zones)

With additional analysis of the zonal map (figure 2), it can be noticed that suburban areas have minimal or insufficient service, provided only by one line, for instance, suburban areas (traffic zones 4, 7, 8, and 11). Parts of the town don't have any service of public transport at all (traffic zones 1, 2, 3 and 6).

In the town's road network, public transport vehicles use the same traffic lanes together with other vehicles, respecting the traffic signal system which is unique for the whole urban transport. There aren't dedicated bus lanes in the traffic network. Also, so far, in the town of Bitola, public transport vehicles never had priority at crossroads.

Further analysis of the current situation has pointed out certain lacks and problems referring effectiveness and attractiveness of the service quality, such as [3]:

- low level of confidentiality in the public transport service: irregularity, low frequency and low level of comfort
- out-of-date vehicles in public transport fleet (with an average age of vehicles of 21 year), and inappropriate technical characteristics of the buses
- too long travel time for the users to the bus stops (distances above 500 metres)
- poor bus stops infrastructure
- absence of real-time information system for the passengers at bus stops, as well as for the passengers in vehicles
- absence of coordinated schedules (itineraries) for all operators and absence of unique tariff system.

All these problems and lacks are very clear indicator for the necessary need for changes in the current situation. The purpose of change will be to provide an advancement of the service in the public transport in the town of Bitola.

2.2. Categorization of the problems in the public transport

All previously mentioned problems in public transport in the Bitola town can be categorized in four categories. These categories arise from the fact that technical efficiency cannot be analyzed independently of the institutional or regulatory constraints [7].

The precise identification of the problems presented next is a key element for their solution and also for creating the future policies for public transport development.

2.2.1. Organizational problems

For the last two decades, several European countries have been implementing significant changes in the organizational and regulatory frameworks of their local public transport systems. These reforms, promoted by the European Commission (European Commission, 2005), aim at curbing the decline of the sector, restoring economic efficiency, and improving the quality of the service in a context of severe public budget constraints. The hypothesis underlying these policies is that organizational and regulatory settings affect performance [7].

Organizational problems in the public transport refer to the way of definition of market of services. In the town of Bitola, public transport is performed only by private operators, meaning that there is an absence of public company for this service. But, the offered service is degraded because of the direct competition between private operators themselves.

Public operators have a tendency to provide a service only in the central part of the town, where the

number of users is the greatest. Besides this, there is an absence of coordinated itineraries in their service. Referring ticket price, there isn't difference between different operators. However, because public transport is not functioning as a unique system, those passengers which have monthly ticket at one operator, cannot use buses from other operators with the same ticket.

Hence, for public transport to fulfill its role it must function as a unique system with unique and coordinated itineraries and unique tariff system [8]. As long as this condition is fulfilled, it is less important whether there are one or more operators or whether the operators will have private or public ownership.

2.2.2. Financial problems

As a result of the conflict between the need to provide optimal quality of the transport service from one side, and real transportation expenses from another, there is a necessity for subsidies in the public transport [9]. Subsidies will cover the difference between the real price of transportation and average ticket price.

The current situation in the public transport in the town of Bitola is a rare example for absence of subsidies in the public transport. Operators themselves pointed out that until 1994 they received subsidies, but since then they haven't received any financial help from national or local authorities for improvement of their situation. This has major impact on the poor condition of the fleet and low quality of service. Hence, for many years operators are working with financial exhaustion, with high fuel prices and high prices for maintenance of old vehicles, without any kind of support from national or local authorities.

2.2.3. Problems with the service quality

Over the last few years, public operators have gradually focused on service quality and customer satisfaction [10]. This strategy is very profitable for both operators and customers. An improvement of the supplied service quality can attract further users. This fact could resolve many problems (e.g., helping to reduce traffic congestion, air and noise pollution, and energy consumption) because individual transport would be used less [10].

Service quality is a measure of how well the service level that is delivered matches customer expectations. Service quality is an abstract concept that is hard to be defined, and in practice, often used interchangeably with satisfaction [11]. However, the differences between both variables have been clarified in the literature - service quality is more specific and related to cognitive judgments while

satisfaction is more holistic and associated with affective judgments [11].

Additionally, for this reason, the development of techniques for customer satisfaction analysis is necessary. These techniques will allow the critical aspects of the supplied services to be identified and customer satisfaction to be further increased [10].

Maintenance of the service quality should be the base for competition in the public transport market [12].

Activities such as measuring service quality are necessary for proper organization and functioning of public transport [12]. The modeling results from the research reveal that users would derive a benefit from an improvement in service reliability and a reduction in crowding [13].

The quality of public transport service includes more elements, which obtained different significance percentages from the passengers during the assessment processes (diagram 1). These data originated from the Traffic study for the Bitola town 2010/11, prepared by the Faculty of Technical Sciences in Bitola [3]. As a part of this study, on December 12, 2011 interviews were conducted at 11 bus stops at all lines in the urban area with 1421 surveyed citizens in total.

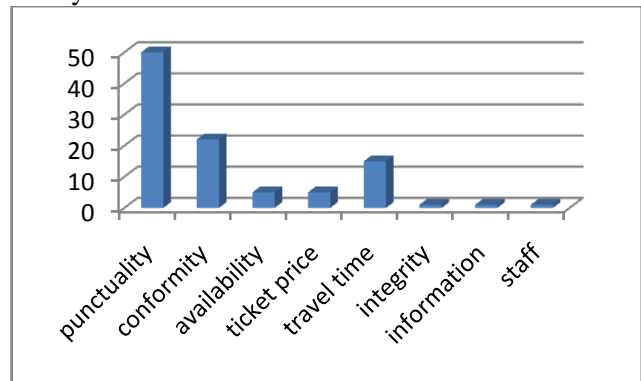


Diagram 1: Significance of the elements defining the quality of the service

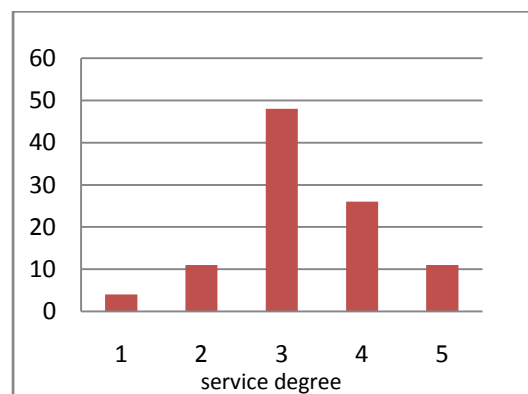


Diagram 2: Total appraisal of the service quality (1 – bad, 5 - excellent)

It is evident that very bad working conditions in the public transport contributed for low level of

service quality (48% of the users gave an appraisal of 3, diagram 2). Public transport operators have problem with the regularity and punctuality in service, which are at insufficient level (and according to the interviews they are the most significant for the users with almost 50%, diagram 1). Also, there are problems with the maintenance of the itineraries, travel time is too long, the passengers are unsatisfied from the comfort in old vehicles, there is insufficient information, and equipment of the bus stops is at a very low level. Therefore, the results from the bus-stops interviews referring service quality were disappointing.

Providing service quality in the public transport is of exceptional significance for realization of the purposes in the public transport. Only a qualitative public transport may attract more passengers, contributing in this way for decrease in the use of private cars for urban journeys [8].

Nowadays, many large and medium size public transport organizations and operators apply quality control systems, accompanied with scientific and technological aid. In the long run, such initiatives may contribute to attract more customers and facilitate the economic viability of organizations [14].

2.2.4. Problems with the absence of integrated transport policy

An integrated transport policy has a number of possible objectives, such as: economic efficiency, environmental protection, safety, accessibility, sustainability, economic regeneration, equity, finance, practicability and other [15].

In order to approach to these objectives for integrated urban transport policy, the town primarily must solve the problem with taxi transport [3]. In the town of Bitola exists deformation in the market of passenger transport caused by the high number of registered taxi-drivers from one side, and even higher number of unregistered and illegal taxi-drivers from other side. This group of illegal taxi-drivers works without any responsibilities to the state, taking a large part of the passengers, who will otherwise use public transport to reach their destination. Therefore, this kind of taxi-drivers is disloyal competition to the public transport. The total number of taxis is 256.

Although public transport operators are united in informal association, so far it hasn't had a concrete opportunity to do something for the advancement of the poor condition in public transport.

For the future, based on developed policy for sustainable urban transport, it may be a good idea to take into consideration to provide a priority for public transport vehicles at signalized crossroads [12]. These priority measures should be introduced at

those parts of the transport network where congestion is frequent. For the Bitola town, there are a few crossroads in the centre that have congestion in peak hours.

2.3. *Direction for the development of the public transport*

Previously explained categories for problems in the public transport could serve as a basis for definition of a series of activities. They will allow the development of a public transport customized to the needs and priorities of the operators, as well as to the requirements of the users [14].

2.3.1. Needs and priorities of the operators

An activity of primary importance is the sound identification of all attributes of the public transport [14]. Although a basic knowledge might exist, each operator has its own characteristics and particularities that require different approach. Here, the goal is to collect and analyze all the necessary information about the network, the infrastructure and any other operational element that will shed light to the services.

2.3.2. Analysis of the experience of similar European organizations

It is advisable to take advantage of the experience of similar public transport operators with long experience in the implementation of quality control programs. Their know-how and experience will provide valuable information for the quality control programs applied [14].

2.3.3. Customer satisfaction/dissatisfaction survey

A customer satisfaction/dissatisfaction survey is another important activity that should be conducted in order to identify the priorities, expectations and degree of satisfaction of the passengers regarding the transport services. In such surveys, the passengers provide the importance and satisfaction given in a series of quality and operational attributes of the transport system [14]. By applying the appropriate methods those attributes that are important and do not perform satisfactorily could be derived, always according to the passengers' opinion.

2.3.4. Pilot quality control program - Quantification of indicators of high priority

An activity that can be proved fundamental is the quantification of specific indicators that are of high priority for the local operator [14]. This is a kind of pilot program and upon conclusion, an appraisal of the results of the priority indicators can be made in order to make adjustments and refinements for the

future quantification of these and other indicators.

3. Proposal for new lines in public transport

The quality of the service in the public transport is a key factor for realization of modal transfer from private motorized transport to sustainable ways of transport [9]. Analysis of the current situation has showed the need for implementation of changes in the public transport, in order to achieve effective, available and in-time service for every citizen in the town.

In the Traffic study for the town of Bitola 2010/11, a zonal parking in the town centre was planned and since 2013 has been implemented. As a result, a decrease in the number of journeys by passenger car should be expected, but so far there isn't any research data. If the problem with unregistered taxi-drivers is going to be solved in the near future, these measures and improvements considerably must be followed by offered alternative as a replacement for the car. At first place comes public transport with a more qualitative service, which will cover the entire area of the town of Bitola (central part of the town together with the suburbs). But, to achieve competitive transport, apart from the wide urban coverage and availability for higher number of users, public transport must improve its regularity, punctuality and comfort [8].

In many countries today, major investments are being made in public transport systems in order to make them more competitive with other means of transport, most notably private cars [16]. New services are being developed and old ones are being improved. However, an increase in supply (qualitatively or quantitatively) will not automatically lead to a corresponding increase in demand and satisfaction. To make sure that investment really attracts the existing and potential customers expected, knowledge of satisfaction should provide policy makers and operational managers in the public transport system with valuable information. In particular, satisfaction studies can provide decision makers with information about what customers consider important, as well as information about how the existing public transport service is perceived as performing in these dimensions [16].

To summarize, satisfaction is increasingly being put forward as key to the future development of public transport, both in theory and in practice [16].

The proposed solutions, e.g., two new lines respectively, could contribute for improvement of satisfaction of the users [3]. Also, they are expected to be functional from several aspects. The current transport network in the town of Bitola supports

these solutions, because there isn't need for complex constructive changes. Also, there is the aspect of the supply with optimal public transport service, covering the entire territory of the town.

Hence, the changes in public transport in Bitola town should not stop only with eventual implementation of this proposal. In order to assess its strength and weaknesses, a further research studies for the customer satisfaction are recommended.

3.1. Data analysis

Analysis of the data is performed considering the data obtained from the interviews at the bus-stops in 2011 and additional data from the Traffic study for the town of Bitola 2010/11 [3].

The obtained results from the interviews at the bus-stops refer to the purpose of travel and frequency of usage of public transport (diagram 3 and 4). According to diagram 3, the biggest percentage have journeys to work and to school/faculty (20-22%). From the respondents at the bus stops, the biggest part are regular users (34%), while lesser percentage (29%) refers to the periodical users (diagram 4).

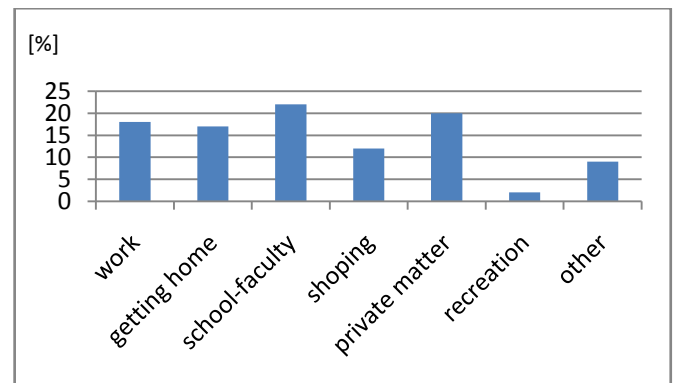


Diagram 3: Purpose of the travel

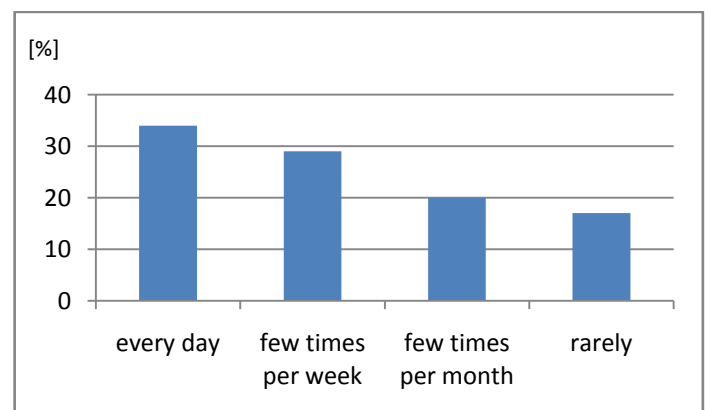


Diagram 4: Frequency of usage of public transport

The data from these interviews show that there is a need for advancement and development of the current service in the public transport, supported by the percentage of everyday usage of its services.

The data from the Traffic study refer to the 14-hours counting of vehicles at 41 crossroads in the town of Bitola. The processing of the obtained data has provided results according to which an analysis

of the entry/exit journeys for each traffic zone separately was performed (table 1).

Table 1. Entry/exit journeys for traffic zones

Traffic zone	I,II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Entry journeys	17624	8367	11216	1701	1579	3976	1208	3242	6408	1291	1737
Exit journeys	26102	5803	9112	2560	1782	3660	1156	3631	4126	1102	1874

The data given in table 1 are needed to point out the zones with highest frequency in travelling, which later is used for the projection of the trajectories of the newly proposed lines. As can be seen from the table, most entry-exit journeys are concentrated in the first, second and fourth traffic zone.

Furthermore, using the Traffic study, data for the total number of journeys daily per family (diagram 5) and data for the most used transport mean (diagram 6) are used. According to the diagram 5 it may be concluded that every family in town on daily level has numerous journeys (4 and 6 journeys, or 28% and 31%). At the same time, as the most used transport mean a private car appears (41%), while the use of public transport is at third place with 18% (diagram 6).

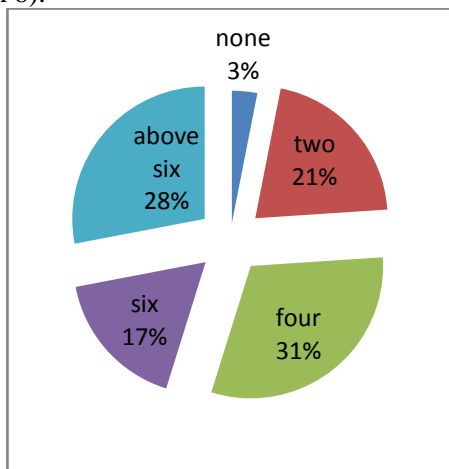


Diagram 5: Total number of journeys daily per family

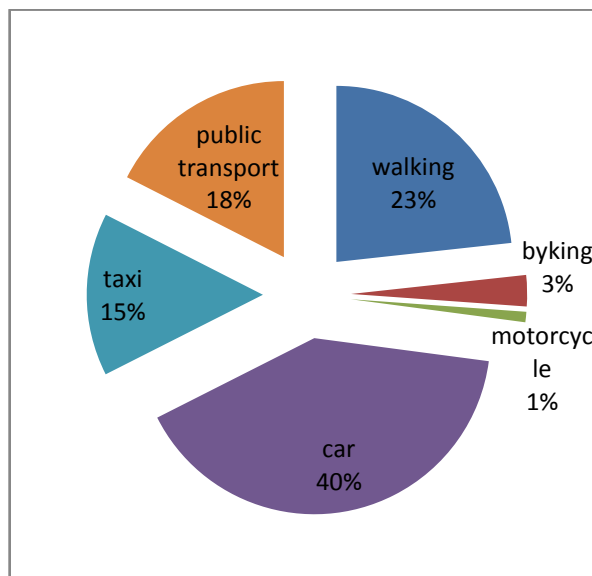


Diagram 6: The most used transport mean

Hence, in general it may be concluded that apart of the high frequency in daily urban journeys of the citizens in the town of Bitola, the public transport is not a dominant way of transport. This has been concluded from the total appraisal of the service quality, given from the users themselves.

All these data are used in the process of projection of the trajectories of new lines.

3.2. New diametric lines in the public transport network

Definition of the trajectories of new lines should be in accordance with the transport demand of the citizens [9]. Geodetic constellation and site specificity of the Bitola town impose a specific road infrastructure which cannot be radically changed, but only partially modified and upgraded. Therefore, it is necessary that transport is managed and upgraded according to the conditions imposed by the road infrastructure.

This task is very difficult to conduct in practice. However, apart of the round lines of public transport which are present at the moment, an introduction of diametric lines is proposed. Their introduction indicates that public transport network is going to be transformed from circled (ringed) to radial-ring network.

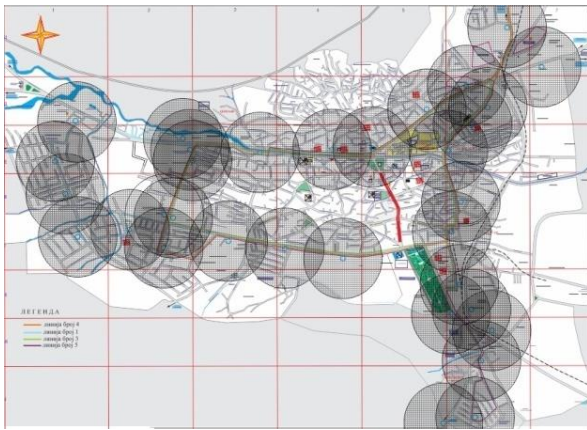


Figure 3. Radius of constellation of bus-stops

In figure 3, a constellation of the bus-stops in the radius of 350 meters is presented [17]. This distance is optimal for medium-sized towns, in which the Bitola town belongs (<100000 citizens).

The analysis of the current situation has helped for the creation of figure 4, in which the textured fields with external red line represents town's parts which doesn't have public transport service [17]. Textured fields with external green line represent town's parts served by only one public transport line.



Figure 4. Parts of the town without public transport service or serviced only by one line

On the basis of current situation and analysis of the town's coverage with public transport lines (figure 4), as well as on the basis of all relevant data (section 3.1), two new lines are proposed for introduction. Their introduction is apart from the current lines in public transport, in order to obtain the network of lines presented in figure 5.

It must be underlined that during the projection process of the trajectories, besides the interviews results, a several limitation were taken into consideration, especially referring the geometric characteristics of the town's streets, such as [3]:

- narrow cross profile, e.g., small roadway width, insufficient for buses to passes by with other vehicles, even in the situation when small-sized buses or minivans are used

- big longitudinal inclinations make impossible for buses to have normal movement, especially during the bad weather conditions (ice, snow etc.)
- small width of sidewalks or a total absence of sidewalks, as well as an absence of larger free space between streets and buildings from both sides, so that in the case of public transport line, safe movement of pedestrians will be jeopardised
- small width of sidewalks or a total absence of sidewalks, which limits the possibilities for locating the bus stops
- small radius of some crossroads or streets curves with big longitudinal inclination, unacceptable for normal turn-over and manoeuvring of the public transport vehicles.

Additional limitation not connected with geometrical characteristics of streets, is current regime of traffic flows (one-way or two-way traffic flows). Because of that, at specific sections of the trajectories, the proposed diametric lines have a shape of round lines.

These limitations have contributed for shifting from the current coverage with public transport service in the town of Bitola (given in figure 4), changing as well the first design of the trajectories of newly proposed lines. Hence, the previously mentioned limitations were the main factors in the definition of the final design of the lines in public transport [3].

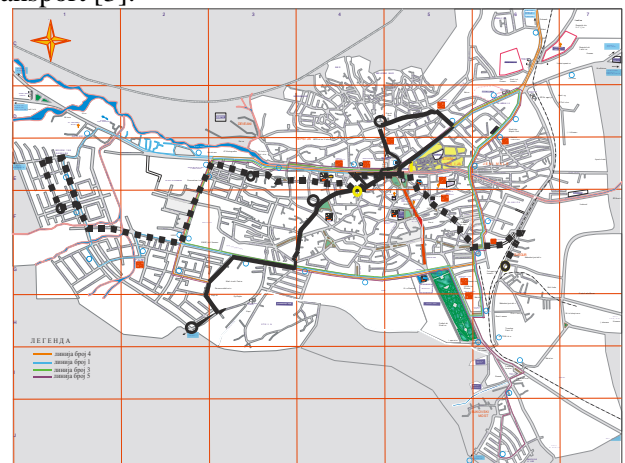


Figure 5. Proposed new lines in the public transport in the town of Bitola

In the context of the proposed solutions for extension of the public transport service, figure 5 presents two newly proposed lines. Dashed black color is line planned to serve traffic zones 1, 2, 5, 7, 8, 9 and 12. Full black color has the line which will serve the traffic zones 1, 2, 3, 6 and 7. Hence, this projection of the lines trajectories provides connection between zones with the most entry/exit journeys (first and second zone) and zones which have poor public transport service.

These proposed lines will provide connection between central area of the town and suburban areas which so far have been insufficiently serviced by public transport.

Defined lines of public transport, extending the public transport network, should provide fulfillment of two basic functions: collection and distribution of passengers and their transport (in-time and frequent). What kind of compromise will be achieved between these two conflicted claims during the line definition depends from the number and distribution of passengers along the line, as well as from the journey length [9].

3.3. Technical aspects of the projection process

The newly proposed lines have need of minimal constructive changes, because they will use the current road infrastructure. At specific spots, in order to provide semi-circled turns of the public transport vehicles at the end terminals, a constructive change is needed (figure 6).



Figure 6. Terminal which needs constructive change of the current central island to provide round flow

The black circles in figure 5 represent the newly proposed bus-stops. Additional selection for new bus-stops, or allocation of the current ones and proposed ones, will depend from the future changes in the urban planes. Besides, the precise location of the bus-stops will be defined according to the data for transport demand and frequency of the citizens in these areas. But this is going to be a subject of analysis in the future projects and strategies for development of public transport.

At specific locations, new lines could use previously placed bus-stops which currently aren't in function (fig. 7). Several of them could be easily modified for the higher safety of the pedestrians and public transport users [3].



Figure 7. Former-bus stop included in new trajectories

To provide unobstructed movement of the public transport vehicles at proposed streets the problem with street parking needs to be solved. The best option at specific streets is parking to be completely banned (fig. 8 a,b).



Figure 8a. Parked vehicles and unsafe movement of the pedestrians



Figure 8b. Obstructed left turns because of the parked vehicles on the street

The trajectories of the new lines with small changes can be easily adjusted to the changes in the traffic flows regime (from two-way to one-way).

Because of the lower range of some of the urban streets at which new lines will pass by, it is proposed smaller public transport vehicles to be used, e.g., minibuses. This could become an obligatory precondition because at specific sections the road infrastructure doesn't permit free movement of standard sized buses.

The final organization of public transport with all elements of the service (time interval, vehicle frequencies and number of vehicles at each line) depends from the results of the further analyses for

assessment of travel needs, travel demand, and availability of public transport in the areas in which this service is offered [3,9].

4. Acquisitions from public transport development

If the result from the introduction of new lines is going to be an increased number of journeys by public transport and decreased number of journeys made by car, than several acquisitions could be accomplished. The intention of implementing proposed solutions is to achieve a better quality in public transport. Hence, acquisitions for all the citizens, not only for the public transport users, could be manifested in the following forms [3]:

- achievement of sustainable modal distribution of journeys
- diverse choice for the transport mode
- decreased congestion in the central area of the town
- better connection between peripheral areas and central area of the town
- availability of service to the higher number of users
- environmental protection, referring lower noise and emission level, especially if apart of the decreased number of passenger cars at streets, minibuses use cleaner fuels
- smaller need for capital investments intended to increase the capacity of the town's streets and to build objects for car parking
- possibility for the urban planners to dispose with more space that otherwise would have been reduced for the needs of motorized traffic and parking areas; wherewith they will have opportunity to design more friendly environment, where green areas and other livable contents will dominate.

Further, the implementation and maintenance quality of the new lines for public transport will oblige public operators to [14]:

- assess the performance of the new services
- take measures towards service improvement
- monitor the progress of the quality of its services in the future
- better understand the needs and priorities of the passengers
- establish an effective communication and cooperation between all parties involved in the local transport system (operators, subsidiaries, ministries, municipalities, etc.)
- perform a customer-oriented scheduling process of the transport service and internal operation of the organization and

- support the decision making process of strategic character.

5. Conclusion

Among the prime goals of all actors involved in the public transport business is the creation of a well-organized system, within which citizens can find a sufficient level of mobility and satisfy their important need for the efficient movement under safe and comfortable conditions [14]. This overall principle entails many significant quality characteristics of the public transport, such as safety, on-time performance, accessibility, efficiency, information provision and many others. The quality in public transport stems from the ability of the respective operators to manage and to further develop their services [14].

Specifically in public transport, service quality is a matter of the greatest importance because an improvement of quality levels can attract further users. An increase in public transport use, with a reduction in the use of the private car, could help to reduce many problems like traffic congestion, air and noise pollution, and energy consumption [18].

In the absence of policy for development of urban transport and in a situation in which the role and the significance of public transport for urban life quality is underestimated, today in the town of Bitola exist exceptionally poor condition and bad service of public transport.

Because of these circumstances of public transport in the town of Bitola, it is evident that service quality is at low level. The regularity and punctuality are unsatisfactory, the travel time is long, the transporters have problems with the aging of the fleet and keeping the itineraries, the passengers have insufficient information, and the condition of the bus stops and comfort in the vehicles is at low level.

The proposed solutions for advancement of the public transport service are result of the function, role and significance that public transport has for the sustainable urban transport.

Implementation of two new lines will provide improvement of the level of service, mainly because public transport will be extended to suburban areas and peripheral parts of the Bitola town. Hence, these two new lines will provide greater coverage with the public transport services, especially for those parts of the town that have minimal or insufficient service.

In addition, new lines will provide increase of the public transport availability to higher number of users. In that way, besides the private car the citizens will have available another sustainable alternative for urban journeys.

Literature research examining quality improvements in public transport and their effect on satisfaction show that the satisfaction experience when using public transport services is influenced by quality improvements only to a limited extent. The reasons for this might be several [19]:

- frequent negative critical opinions stored in memory affect satisfaction; sometimes, quality improvements can be realized in long time periods during which some service disruptions inevitably occur
- negative critical incidents are perceived as situations where intended service performance fails to fulfill expectations
- planning and operating departments in public transport companies may have difficulties cooperating and communicating.

Another possible explanation is that transport planners and decision makers have failed in the implementation phase. Also, they should consider informing the public of intended quality programs.

Therefore, there is a long way to increase the quality of public transport in Bitola town and to improve its operation in general. But, in the same time with the implementation of the suggested lines, local authorities have obligation to promote inter-modality and to provide real conditions for the more massive use of public transport. Hence, they need to provide conditions for defining organizational and financial framework in the public transport. If the authorities finally create an atmosphere to overcome the problems, advancement can be achieved in the public transport service in the town of Bitola and the citizens finally can fill the benefits from the qualitative public transport service.

References

- [1]. Porta, S., & Scheurer, J. (2006). *Centrality and connectivity in public transport networks and their significance for transport sustainability in cities*. World Planning Schools Congress, Global Planning Association Education Network, 13-16 July, Mexico.
- [2]. European Commission. (2004). *Towards sustainable urban transport policies - Recommendation for local authorities*. SMILE project.
- [3]. Atanasova, V., & Angelevska, B. (2011). *Preliminary solutions for the public transport in the Bitola town*. Pilot project 5. Traffic study for the Bitola town.
- [4]. European Commission. (2011). *Roadmap to a Single European Transport Area – towards a competitive and resource efficient transport system*. White Paper 2011, COM/2011/0144 final/ Brussels.
- [5]. European Commission. (2001). *Clean urban transport. Results from the transport research program*.
- [6]. Department for transport of Great Britain. (2008). *Building sustainable transport into new developments: A menu of options for growth points and eco-town*.
- [7]. Roy, W., & Billon, Y. A. (2007). Ownership, contractual practices and technical efficiency: The case of urban public transport in France. *Journal of transport economics and policy*, Volume 41, Part 2, pp. 257-282.
- [8]. Krstanoski, N. (2006). *Public transport*. University “St. Kliment Ohridski”, Faculty of Technical Sciences, Bitola, Macedonia.
- [9]. Krstanoski, N. (2003). *Public transport planning*. University “St. Kliment Ohridski”, Faculty of Technical Sciences, Bitola, Macedonia.
- [10]. Eboli, L., & Mazzulla, G. (2007). Service quality attributes affecting customer satisfaction for bus transit. *Journal of public transportation*, Vol. 10, No. 3, pp. 21-34.
- [11]. Sumaedi, S., & Bakti, M., Y., G., & Yarmen, M. (2012). The empirical study of public transport passengers’ behavioral intentions: the roles of service quality, perceived sacrifice, perceived value, and satisfaction (case study: paratransit passengers in Jakarta, Indonesia). *International journal for traffic and transport engineering*, 2(1):83-97.
- [12]. Krstanoski, N., & Atanasova, V. (2008). *A strategy for development of public transport in the city of Skopje 2008-2018*. Faculty of Technical Sciences, Bitola, Macedonia.
- [13]. Cantwell, M., & Caulfield, B., & O’Mahony, M. (2009). Examining the factors that impact public transport commuting satisfaction. *Journal of public transportation*, Vol. 12, No. 2, pp. 1-21.
- [14]. Tyrinopoulos, Y., & Aifadopoulou, G. (2008). A complete methodology for the quality control of passenger services in the public transport business. *European transport/Transporti Europei*, No. 38, pp. 1-16.
- [15]. TRL. (2004). *The demand for public transport: a practical guide*. TRL Report 593.
- [16]. Felleson, M., & Friman, M. (2008). Perceived satisfaction with public transport service in nine European cities. *Journal of the transportation research forum*, Vol. 47, No. 3, pp. 93-103.
- [17]. Blazheski, I., & Paunkovski, Gj. (2010). *Preliminary plan for introduction of new lines in public transport in the town of Bitola*. Seminar work. University “St. Kliment Ohridski”, Faculty of Technical Sciences, Bitola, Macedonia.

- [18]. Eboli, L. & Mazzulla, G. (2008). A stated preference experiment for measuring service quality in public transport. *Transportation planning and technology*, Vol. 31, No. 5, pp. 509-523.
- [19]. Friman, M. (2004). Implementing quality improvements in public transport. *Journal of public transportation*, Vol. 7, No. 4, pp. 49-65.

Corresponding author: Beti Angelevska
Institution: Faculty of Technical Sciences, Bitola
E-mail: beti.angelevska@fb.uklo.edu.mk