

ANALYSIS AND EVALUATION OF THE QUALITY OF THE SERVICES PROVIDED BY BDZ PASSENGERS LTD.

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Abstract

Railway transport allows people to enjoy the freedom to travel, while simultaneously creating economic growth and jobs. Its technological development is of key importance for any modern society, as it helps the achievement of social and regional cohesion. At the same time, it needs to be sustainable, considering the increased amount of resources that goes into carrying out freights and ecological restrictions. The supply of high-quality transport services in synergy with modern infrastructure is vital for highlighting the economic strengths of each individual region in the country, as well as facilitating economic and social cohesion. Effective transport services influence the competitiveness of commerce, accessibility and prices. The quality of the services provided by Bulgarian State Railways (BDZ Passengers) has a strong reflection on production processes and the selection of trading partners. The purpose of the study is to analyze the primary indicators that influence the quality of the transport services that BDZ Passengers provides. The factors that determine the behavior of transport service consumers when they choose their mode of transportation have been analyzed. The quality of services carried out by the national railway carrier has been evaluated. At the end of the study the achieved results are outlined and specific recommendations pertaining to the development of railway transport in Bulgaria are made.

Keywords: railway transport, quality of transport services, effectiveness, comfort, railway infrastructure, sustainable development

JEL: R42, R49

Introduction

Investments in railway transport help expedite economic development by creating jobs and improving accessibility. The construction of a new infrastructure and the renewal of the rolling stock are effective means of improving people's mobility and well-being. Multiple large-scale and ambitious programs for investments in infrastructure and rolling stock have been initiated in Bulgaria, which is essential to developing railway transport and helping it regain its competitive position through effectiveness and competitiveness (NRIC, 2024). This in turn

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involves the preparation and implementation of policies in the field of railway transport, which leads to improving the quality of life of every developed society (European Commission, 2020). The EU's main requirements toward Bulgaria pertain to modernizing the infrastructure, improving the parameters of the rolling stock, perfected technologies, developing the human potential, social and ecological factors, and other parameters in the field of railway transport, which will help it reach the level of European standards. As Dimitrov and Lalov write, in order to stabilize the positions of railway transport in Bulgaria, specific initiatives for increasing the technological level of the infrastructure need to be undertaken (Dimitrov, Lalov, 2023, p. 3)

Over the last 20 years, the main problem of the national carrier has been its negative trend regarding the drastic drop in performance measured in passenger-kilometers, which is due to the following reasons:

- The extremely poor state of the railway infrastructure and the unsatisfactory technical and operational status of the rolling stock;
- Unfair competition of motor transport over the last 30 years. This includes: failure to pay the full cost of carrying out carriages, overlapping services, failure to report all runs, failure to observe the working hours of drivers, which puts bus transport in a much more favorable position in comparison to railways.

The decline in the number of passengers who use railway transport is caused by multiple and various reasons – limited number of trains, with large intervals between their runs, long travel time (lack of coordination between passengers and train traffic schedules), and extreme lack of travel comfort in the obsolete rolling stock (comfort is different in the new „Desiro“ trains).

For this reason, the quality of the transport services provided by BDZ Passengers is extremely poor, which makes potential passengers avoid using this type of transport to travel. This necessitates the creation of new transport sites, the reconstruction and modernization of the existing railway network, and the incorporation of Intelligent Transport Systems (ITS) in the management of the transport process (Nikolova, 2009). The focus should be primarily on reconstructing, modernizing and renewing the rolling stock, incorporating automatics and telemechanics in train traffic, and mechanizing and automating the maneuvering work of locomotives.

The particular position that passenger railway transport holds as a connecting link in Bulgaria's economy for the realization of production and economic connections between other fields, as well as the population's mobility, necessitates the conduction of in-depth economic and social studies when analyzing the quality of the provided transport services. The close connection and interdependence between economic and social effectiveness, which in actuality are the two

primary forms of manifestation of every type of effectiveness, are of particular importance as well. That way, the changes in the factors that influence passengers when they choose their mode of travel, will help improve the economic (financial) parameters of the national carrier, as well as the social function it performs. Therefore, higher economic effectiveness is the basis for increasing social effectiveness, which in turn has a reverse impact on the future growth of economic effectiveness (Vassilev, 2012). As Gatovski and Yordanov write in their study on the socio-economic role of passenger transport, „well-organized and high-quality transport guarantees the normal functioning of every economy by satisfying the population’s travel needs“ (Gatovski, Yordanov, 2018). Razmov and Varadinova have studied the quality of the provided transport services as well, prognosticating that „the realization of investment projects in railway infrastructure and rolling stock will help BDZ Passengers increase the volume of carried out work in passenger-kilometers“ (Razmov, Varadinova, 2013)

Improving social effectiveness involves satisfying the population’s needs for transport services, which is the primary function of BDZ Passengers Ltd. In that regard, the development of Bulgaria’s railway sector should create the necessary conditions for the country’s economic and social development, provide effective, safe and sustainable transport, and aid balanced regional development. This will improve the quality and culture of service, provide more free time as a result of reducing travel time, and, last but not least, increase social effectiveness as a result of the incorporation of new rolling stock, thus improving the population’s living standards and way of life (Arnaudov, 2022).

In terms of its sustainable development, there are three fundamental requirements that passenger railway transport in Bulgaria needs to fulfill in order to be effective:

- Concept of economic sustainability – guaranteeing the improvement of the quality of the provided services and increasing their volume and accessibility;
- The second requirement pertains to ecological sustainability – it guarantees increased passenger flow, as well as the biggest possible improvement in the quality of life in society;
- Social sustainability – the benefits of higher-quality passenger railway transport need to be allocated to all social groups of the population.

Bulgaria’s railway transport system is in a very poor state, as it is economically unstable, it cannot respond adequately to the population’s demand, and it often generates various negative effects on the environment. The solution of these problems necessitates evaluation of the quality of railway services by influencing all aspects of its sustainable development and generating solutions that all interested parties will benefit from. This also involves improving the maintenance

of the other assets of the national carrier beside infrastructure and rolling stock, namely: including external costs for each type of transport when determining infrastructure charges, guaranteeing freight safety through technical efficiency, perfecting the procedures for concluding freight contracts and other administrative measures.

The purpose of the study is to achieve the following results:

- Identifying and analyzing the primary factors that influence the quality of the provided railway services;
- Outlining the dependence between the quality indicators of the provided services and the volume of passenger services;
- Summarizing the main criteria for choosing railway transport as a means of traveling;
- Outlining guidelines and formulating recommendations for improving the quality of transport services;
- Highlighting the trends in the development of passenger railway transport in Bulgaria.

The approach to conducting the analysis includes methods and tools from the methodology and handbook for conducting functional analyses of horizontal and sectoral policies. The study utilizes data from a questionnaire survey conducted by the author on-site, namely several railway stations located within and outside the populated area. Additionally, data from other studies has been borrowed and updated on the principle of extrapolation, with the responses serving as a basis. The utilized methods include the questionnaire survey, analysis of the collected data, analysis of the fundamental problems, statistical processing of the collected contents, and comparative analysis of the factors that influence passengers' behavior when they choose transport services. Once analyzed, the collected empirical information will serve as a basis to highlight specific trends in the development of railway transport in Bulgaria. The results of the study will help outline consumer preferences and the guidelines for improving the quality of the provided passenger railway services.

The limits of the research involve the territorial scope and the specificities in the development of passenger railway transport, which determines consumer preferences in regards to the quality of transport services.

Outlining the Primary Problems Regarding the Realization of Transport Services by BDZ Passengers

In order to identify and comprehend the problems of the national carrier, the current state of the transport services provided by BDZ needs to be analyzed. Once the strengths and weaknesses have been determined on the basis of on-site

inspection of trains and stations, the following factors will have to be taken into account:

- The current physical state of the rolling stock and the railway infrastructure, as well as their capability to provide secure, reliable and safe services that are consistent with project opportunities;
- What is the existing capacity of the national carrier – can all services be accommodated, in view of the demand;
- What are the possibilities for managing, regulating, controlling and operating Bulgaria's railway network.

One of the major problems is the lack of continuous and compatible networks which can provide high-speed and safe train traffic, especially along long shoulders. Failure to adopt specific measures, especially in the short run, is a prerequisite for current trends to remain. That situation of a large portion of the assets of the railway transport system continues to depreciate, and each additional load of the rolling stock and the infrastructure will expedite their deterioration and lead to railway services that are unreliable and unacceptable to passengers.

There are problems with signalization, automation and communication systems, and the ability of all these systems to secure appropriate level of services, which leads to more frequent intervals, low running speed and ultimately to lower quality of the provided services. The lack of flexible management, combined with insufficient funds for current and planned construction activities, is why people prefer road transport as a means of traveling. Factors such as the use of obsolete locomotives and wagons, service provided by aging personnel, and the lack of adequate and up-to-date information about train traffic (schedules) create services that are not consistent with market requirements.

The reasons for the drop in the passenger flow in the last 20 years are multiple and varied:

- Lack of competition on the passenger rail transport market – only one carrier operates;
- Extended travel time and disruptions in the traffic schedule caused by frequent train delays;
- Poor integration between the railway carrier and the other types of public transport (lack of multimodality);
- Lack of implementation of telematic applications for passenger services, as well as general unwillingness to exchange data (TSI²);
- The existing rolling stock is not consistent with European standards for comfort, sanitation and quality of provided transport services. Basic hygiene is not maintained at sanitation junctions;

² Technical specification for interoperability.

- Railway services are predominantly used by passengers using some preferences due to unclear pricing and problems with reservation options;
- Unsuitable platforms along some of the primary railway stations, which makes access difficult for people with disabilities, elderly people and children;
- Lack of preliminary information about train cancellations and failure to supply alternative modes of transportation, which causes inconvenience for passengers, especially when they travel long distances;
- Transfers of passengers through bus services which lowers the quality of service and leads to loss of leading positions and an outflow of passengers who travel by railway transport.

The lack of information systems results in failure to fulfill the requirements for interoperability and makes it impossible to implement modern information technologies in transport planning and the management of the transport process. Marketing activity is another weak point – transport services are not examined as a product obtained on the basis of market segmentations and are not substantiated through adequate implementation of the marketing mix. The existing structuring of trains by type can be improved through the implementation of appropriate marketing approaches and tools, as well as technological design of services. The applied tariff is too complicated and ineffective.

The solution of all of these problems requires investments, appropriate plans for securing said investments, and financing along priority directions. The organizational and management structure of the railway carrier does not presuppose the successful solution of these problems. The activities need to be reengineered, and a new, adequate, organizational and management structure needs to be implemented. These problems are internal to the railway transport sector. The implementation of the system approach and the principles of cybernetics also reveals the existence of problems which, despite being external to railway transport, also hold a great deal of importance in regards to the losing positions of passenger railway transport. These problems include the lack of coordination in train and bus schedules, the low levels of intermodality and multimodality, and the growing competition between bus transport and railway transport along primary routes (Arnaudov, 2023).

Evaluation of the Factors That Influence the Quality of Services Provided by BDZ

Over the last 20 years railway transport has been used primarily by the social groups of the population and employees of the enterprise itself, as well as employees from the National Railway Infrastructure Company (NRIC) and the Rail-

way Administration Executive Agency who receive travel discounts. The drop in the volume of carried passengers and the poor financial state of BDZ Passengers were exacerbated by the 2020 pandemic. The structure of carried passengers and the amount of work performed during the examined period (2017 – 2023) cannot determine a stable trend towards rising or dropping (NSI, 2024).

Table 1: Passengers carried and transport performance by railway transport 2017 – 2023

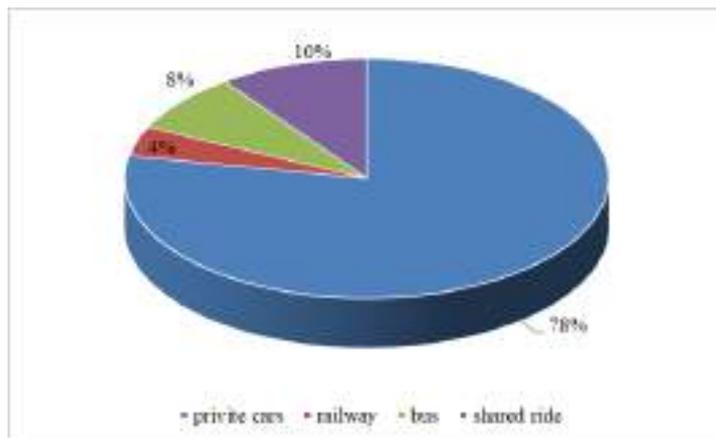
| years | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|-------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Passengers carried (in thousand) | 21 203 | 21 338 | 21 340 | 16 810 | 17 147 | 23 074 | 21 822 |
| Transport performance (million pkm) | 1438 | 1480 | 1524 | 1120 | 1205 | 1603 | 1596 |

Source: NSI.

A very weak trend of growth in the number of transported passengers (barely 135 passengers) is observed in the pre-pandemic period – there is virtually no change for 2019 in comparison to 2018. Following the drastic drop in 2020 (– 26.7%), a significant growth is observed in 2022 (+ 27.2%). 2023, however, marked a relapse to the pre-pandemic levels. On-site questionnaires have shown that most people exercised caution in 2021, and in 2022, when most of the restrictive measures were lifted, a positive trend of mass travel is observed after approximately two years of bans. In 2023 the continuing deterioration of the quality of provided railway services resulted in a drop in the number of passengers who regularly use railway transport to travel. The most frequently cited reasons for said drop include poor train sanitation, delays and lack of information about train cancellations. The questions posed in the poll are as follows:

1. Which mode of public transport do you prefer to travel by?
2. How often do you use rail transport?
3. Do they use preferences when traveling?
4. What would make them use railway transport?
5. What are the needs for changes in terms of services provided by BDZ?
6. How would your attitudes change if the quality of the provided railway services is improved?

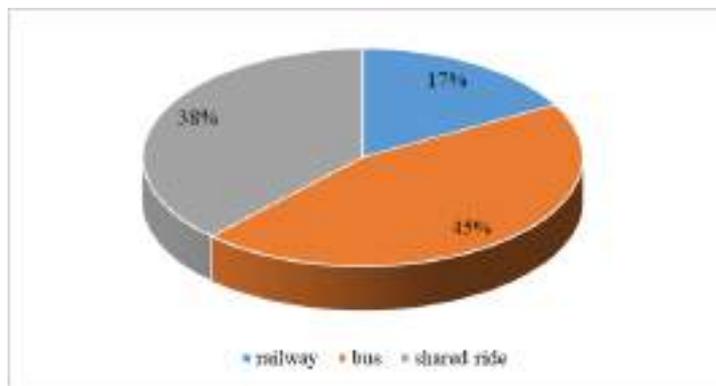
The survey was conducted in February and March 2024 at Sofia Central Railway Station, Poduyane station, and with the cooperation of conductors who work on some of the trains traversing the Sofia – Plovdiv, Sofia – Burgas, Sofia – Varna, Sofia – Blagoevgrad and Gorna Oryahovitsa – Ruse lines. The data summarized from the questionnaire survey is presented in the following figures.



Source: Survey of the author

Figure 1: Which mode of public transport you use?

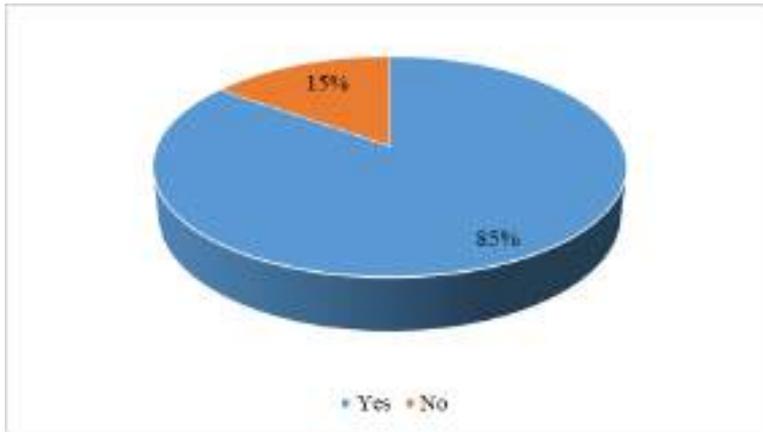
The graphic makes it clear that the data from the first question shows that people predominantly use private cars to travel. Private cars are not featured as an answer in the next graphic which showcases a preponderance of bus transport and shared rides.



Source: Survey of the author

Figure 2: Which mode of public transport do you use?

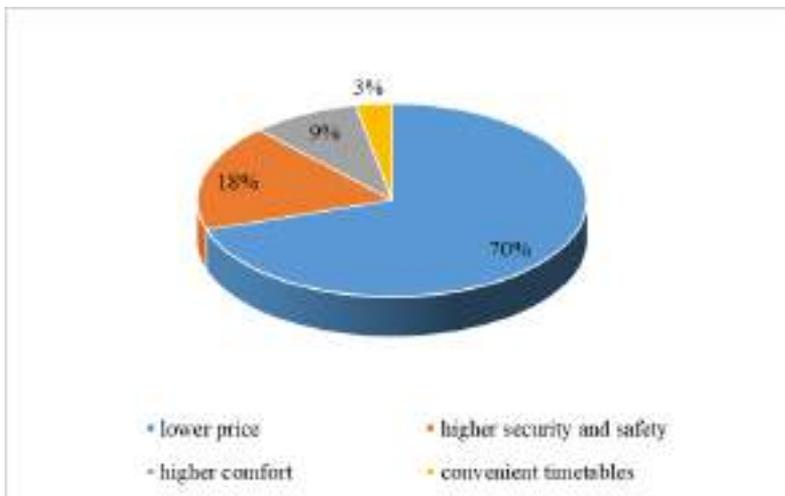
The following graphic shows the answers to the question pertaining to the use of preferences when traveling by railway transport.



Source: Survey of the author

Figure 3: Do you have any preferences?

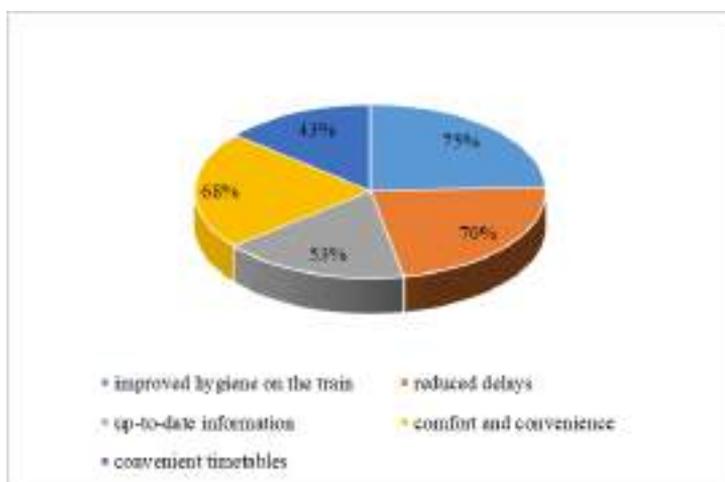
The data shows that the share of passengers who cite preference as a crucial factor in regards to using the services of BDZ Passengers is almost 6 times as high as the share of passengers who do not use the services. When asked about the major factors that play a role in choosing the type of transport, the interviewees respond as follows.



Source: Survey of the author

Figure 4: A major factor in the choice of rail transport

Approximately 3/4 of the interviewees share that they use railway transport because of low travel prices. One in five BDZ Passengers considers this type of transport to be safer and more secure compared to road transport and bus transport. A very small percentage of consumers cite comfort or convenient schedules as reasons for using the national carrier. This, in fact, prompts the next question in the poll, namely – What would make them use this type of transport more frequently as a means of traveling between populated areas in Bulgaria.

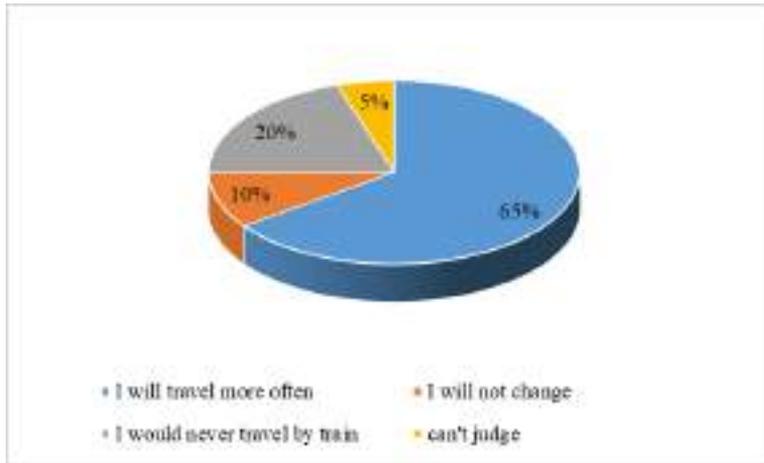


Source: Survey of the author

Figure 5: What would make you use rail transport more often?

As the graphic shows, a specific answer cannot be highlighted. Everyone who uses or would use railway transport to travel demands that all conditions be improved. The sum of the percentages is over 100 due to the fact that the participants in the questionnaire have selected all the answers, only ranking them by weight in accordance with their views and preferences.

In regards to the final question, which asks if they would change their attitudes if travel conditions in trains are improved, most of the interviewees have answered that they would travel more often.



Source: Survey of the author

Figure 6: How would your attitudes change if the quality of the rail service on offer was improved?

Most of the interviewees (2/3 of them) would use trains more frequently as a means of traveling, but one in five would not use trains, regardless of whether travel conditions are improved and travel time is reduced.

In conclusion, it can be summarized that the services provided by BDZ Passengers presently attract passengers primarily with the price factor, which applies to the working population, and with the preferences factor, which applies to students and certain social groups. The main factor which clearly stands out is „lower prices“ – its share exceeds all other factors put together. The questionnaire survey shows that improving the quality of the services that the national carrier provides, namely shorter travel time, as well as improved comfort and sanitation will not only attract new passengers, it will make it a worthy competitor to bus transport.

Analysis of the Quality of Railway Services Provided by BDZ

In essence, the quality of the rail service offered is a key element that contributes to the competitiveness of BDZ Passengers, thus helping to differentiate it from its competitors (bus companies). Service quality has become a significant area of focus not only in the private but also in the public sector and as a national carrier BDZ faces the challenge of ensuring passenger satisfaction by providing a high quality service. Offering a quality service is essential due to the realisation of the major impact it has not only on loyalty, satisfaction and reliability but also on the company's costs and profit. What is specific about passenger rail service quality

is that the passenger is involved in the evaluation, especially in situations where a high degree of passenger involvement is required. In these cases, the quality of the service offered is largely dependent on passenger input – in fact, this is the main reason for the low utilisation of rail transport in Bulgaria. The concept of rail service quality should capture the attention of all stakeholders and reflect their perspective. This implies that service quality should be oriented towards comparing passengers' perceptions with their expectations in assessing quality (Lehtinen, 1982).

Studying the factors that influence the quality of passenger railway services will highlight the approaches for restoring the positions of the national carrier, as well as trust in this type of service in general. The purpose is to determine the level of impact that each individual factor has on the appeal of the services that BDZ provides and identify the ones that will have the most influence in terms of attracting new passengers. This in turn will create objective prerequisites for correct prognostication of passenger services for a future period when better travel conditions have been ensured.

The primary factors that influence the quality of the provided railway services include travel time, frequent delays or train cancellations, hygiene (especially at sanitation junctions), travel comfort, ticket issuing, and the lack of up-to-date information about train traffic.

Travel time is one of the primary factors for improving the provided transport service and attracting additional passengers. To a great extent, it depends mostly on delays due to various reasons and running speed along the railway infrastructure. The main reasons include lack of rolling stock, constant restrictions along the railway infrastructure because of repairs, poor organization of train traffic and regulatory constraints in some cases.

The observance of the aforementioned factors forms a large portion of the requirements and criteria for the quality of the transport services provided by BDZ Passengers. The questionnaire surveys conducted among the consumers of railway services show that there are major inconsistencies between passenger supply and demand of high-quality services mainly due to the fact that schedules are run with obsolete and poorly maintained rolling stock which does not fulfill the technical, operational and technological requirements.

A key factor for the poor quality of the transport services that the national carrier provides is the critical condition of the available rolling stock, which has led to a drastic rise in passenger train delays and by extension travel time in recent years. The commissioning of Smartron locomotives and electric trains has helped reduce delays over the last 3 years. Table 2 shows a reduction of delays in 2023 compared to 2022, which is mainly due to new locomotives and multiple-unit trains (BDZ, 2024).

Table 2: Delays in % 2023 vs 2022

| Category of trains | Domestic long-distance trains | | Regional and suburban trains | |
|----------------------------------|-------------------------------|--------|------------------------------|-------|
| | 2022 | 2023 | 2022 | 2023 |
| Total delays at final station, % | 47.73% | 38.76% | 10.26% | 8.78% |
| Delays up to 60 min, % | 42.51% | 35.34% | 7.15% | 6.43% |
| Delays from 61 min to 120 min, % | 7.84% | 4.52% | 4.32% | 3.22% |
| Delays over 120 min, % | 3.29% | 1.29% | 2.24% | 1.89% |

Source: BDZ.

The good trend of reducing delays in 2023 has been overturned in 2024 as a result of planned repairs, rehabilitation and modernization along primary railway network routes. The serious repairs of Sofia's railway junction, which began in March, affect all trains departing from Sofia to destinations in Northern Bulgaria such as Mezdra, Vidin and Pleven. This has caused all trains to exit Sofia's railway junction with 40-minute delays, which is the main reason why the trend of train delays has been overturned in the present year. Additionally, repairs are under way along the following sections and routes: Dragoman – Slivnitsa and Elin Pelin – Septemvri, Ihtiman – Kostenets, which are along Line 1, Dabovo – Tvarditsa (Line 3), Kaspichan – Ruse (Line 4), and Orizovo – Mihaylovo (Line 8). Activities involving modernization and rehabilitation of railway lines are under way along the following routes: Plovdiv – Burgas, Sofia – Septemvri, Shumen – Karnobat, and Stara Zagora – Dimitrovgrad.

As the table shows, the longest delays have been recorded for domestic long-distance trains, reaching up to 60 minutes at final stations. The extended travel time resulting from the low running speed that causes these train delays due to traffic schedule violations, creates additional inconvenience for long-distance commuters.

Train cancellations and/or delays are a common occurrence which is caused primarily by the lack of rolling stock that is fit to operate. The rolling stock is not consistent with comfort and sanitation standards, whereas the maintenance and repair of the obsolete fleet are never done within the provided deadlines and require significant funds. A large portion of the available rolling stock cannot be fully utilized – not just along the rehabilitated and modernized railway infrastruc-

ture, but also the one that has yet to be invested in. This is caused by systematic delays in the completion of repair programs due to lack of spare parts, equipment and qualified personnel. The lack of qualified personnel in particular is also a problem in and of itself, mainly due to a combination of difficult working conditions and non-competitive remuneration, especially in operating stations located in major cities.

Sanitation is a fundamental problem for people who use railway transport on a regular basis. With regard to the cleanliness of the stations and the trains themselves, there are serious problems, given that passengers mainly complain about the irregular cleaning of waiting rooms, compartments and toilets. The following table shows the level of hygiene in trains determined by passengers.

Table 3: Level of hygiene in trains

| Level of hygiene in % | | | |
|-----------------------|------|--------------|------|
| very good | good | satisfactory | poor |
| 2% | 9% | 12% | 77% |

Source: Survey of the author

Most of the participants in the questionnaire have determined sanitation as a major factor for the outflow of passengers who use railway transport. All of them consider the level of hygiene in trains to be extremely poor – dirty seats, unclean windows, contaminated surfaces, completely unmaintained sanitation junctions and lack of accessories when using them. All this is explained by the fact that the intervals between cleanings are too long, which means that more resources are needed – staff and materials. This problem can be solved by hiring additional people or outsourcing the service to an external company, thus reducing the cleaning intervals. In addition, fines should be imposed on passengers who litter to have a disciplinary effect.

Travel tickets are still issued in the traditional way – by purchasing them from ticket-offices at the stations. Although tickets can be purchased via BDZ's website, a very small percentage of BDZ consumers use that option. The data from the questionnaire illustrates the nature of this outdated way of selling tickets.

Table 4: Different ways to buy tickets

| How you purchase your ticket? | | | | | |
|--------------------------------------|----------------|------------------|-----------------------------------|----------------|------------------|
| long distance | | | short distance up to 60 km | | |
| at checkout | website | conductor | at checkout | website | conductor |
| 85% | 14% | 1% | 98% | 0% | 2% |

Source: Survey of the author

Passengers are more inclined to purchase tickets through BDZ website for long-distance trips, even if their percentage is very small. The majority of them (90%) use this method of purchasing their tickets in order to reserve seats in sleeping-cars. In terms of short-distance trips, the questionnaire shows that almost all passengers prefer to purchase tickets from the ticket-offices of the respective stations. The number of commuters who purchase tickets from conductors, especially when boarding at small stations which do not have ticket-offices, is dismissively small.

The level of information service provided to passengers who use railway transport is very poor. The company’s website is the only means of receiving information. Even though it is updated on a daily basis, other information that does not pertain to train schedules is either unavailable or difficult to obtain (access). The following table shows the results of consultations with people who use railway services.

Table 5: Level of information services

| Level of information service | | | |
|-------------------------------------|------------------|-------------|-------------|
| excellent | very good | good | poor |
| 1% | 6% | 18% | 75% |

Source: Survey of the author

It is evident that most passengers consider the information services to be insufficient and poor. In addition to failing to „upload“ events that have transpired throughout the week in a timely fashion, the company’s website does not provide information about the number of transported passengers for previous years. It is very difficult for passengers to obtain any kind of information – namely how to purchase tickets online. This is also one of the reasons why fewer and fewer passengers show interest in the services provided by the national carrier.

In conclusion, it can be said that the national carrier should pay more serious attention to the quality offered, striving not only to meet the needs and expectations

of passengers, but also to exceed them. The importance of the quality of the service offered stems from the fact that this has an impact not only on passenger satisfaction but also on the profitability of the company. This in turn would lead to an increase in the number of people choosing this mode of travel, underlining the importance of increased interest in improving the quality of rail service.

Fundamental Requirements in Regards to the Comfort of Traveling with BDZ Passengers

Inferences have been made on the basis of the study conducted among users of railway services, formulating the so-called „customer profile”. Surveys of the opinions of passengers who use the services of BDZ show that marketing studies need to be conducted on a yearly basis in order to identify consumers’ needs, as well as their expectations in regards to the quality and parameters of passenger railway services in Bulgaria. The level of comfort that interior spaces provide is important to potential clients. Passengers perceive comfortable traveling conditions as an indelible part of the provided services. In order for travel comfort to be improved, specific events need to be carried out by the management of the railway carrier, which come down to the following:

- Equipping wagons with light information boards which provide up-to-date, detailed information about specific trips, as well as possible connections with other trains or other types of transport. It is imperative to provide information in English as well;
- Using comfortable and ergonomic seats with appropriate headrests and armrests with removable upholstery which can be laundered on a weekly basis. Comfort in currently operating multiple-unit trains is lowered despite the availability of such seats;
- Sanitation junctions which have enough space to be used by children accompanied by adults, and tinted windows. Automated release of washing water, soap, paper and deodorizers;
- Installing so-called „vending machines“ for automated sale of soft drinks and packaged foods. The machines need to be loaded and serviced on a regular basis;
- Sanitation – maintaining wagon hygiene on a daily basis is fundamental to travel comfort and convenience. Clean seats, windows, lavatories and doors are another fundamental prerequisite for restoring passengers’ trust in this type of transport.

A serious amount of attention needs to be devoted to the creation of overall information provision, in accordance with passengers’ demands – for instance, wagon numbers and the destination that the respective trains will be traveling

to need to be displayed clearly. In addition to wagon numbers, clear information also needs to be provided for wagon classes, as well as seats for people with limited mobility. Trains need to be equipped with enough information tables that provide detailed up-to-date information about the trip to the destination. The internal distribution of the seats on the trains is essential to increasing travel comfort. First-class seats cannot occupy more than 30-35% of the total space inside the wagon; this percentage also depends on specific conditions. The seats need to be placed at a specific distance, as regulated in the rules for Technical specification interoperability (TSI). Seats for people with limited mobility are mandatory, as they provide them with easier access and sufficient room for the wheelchairs they use. Passengers need to stow their luggage in the compartments located over the seats, on the wall with lids (airplane type), as well as wall alcoves on the floor, which are also closed with lids. Train compositions need to include wagon-restaurants (bar-wagons) or bistros, with the possibility of combining the two options. Wagons need to be equipped with screens which will provide passengers with audio-visual entertainment, as well as video surveillance. The availability of in-train public telephones, local lighting and air conditioning, as well as wireless *Internet* connection and *USB* ports for charging smartphone batteries, is a mandatory element for increasing the quality and comfort.

All of these recommendations substantiate the necessity to adopt a complex approach towards the development of passenger railway transport in Bulgaria – renewing the rolling stock needs to go hand-in-hand with improving the situation at stations, reconstructing and modernizing railroads, and standardizing signalization and automation along the entire railway network in accordance with the regulatory requirements of the European Union. The complex approach will provide conditions for improving the running speed of trains, as well as the quality of the services provided along all primary routes of the railway network.

Conclusion

The analysis of the services provided by the railway carrier highlights the necessity to adopt urgent measures towards improving the quality of transport services. The renewal of the rolling stock, as well as the reconstruction and modernization of railroads require serious investments and a significant time horizon. In order to attract new passengers and retain existing ones, measures that will increase the effectiveness of railway transport need to be adopted in the long run, which will help restore trust in this type of transport services. Increasing the share of railway transport in passenger market will improve the energy balance of the country. As Minkov writes in his study on railway transport, „the development of railways will reduce greenhouse emissions and improve the quality of life for society“ (Minkov, 2019).

The conducted questionnaire survey shows retention of the main trends in regards to consumer perceptions and evaluation of the services provided by the railway carrier. Generally, the share of passengers remains stable, with the exception of a slight drop in 2023. The primary motives for using railways as a means of traveling are the low prices, reliability and safety of this type of transport. The lack of adequate measures for overcoming consumer dissatisfaction lowers the quality and the evaluation of the provided services. Train sanitation is cited as a fundamental flaw that needs to be overcome urgently. Other aspects that need to be improved in the short run include observance of schedules, travel time, delays, comfort and information services. Activities pertaining to the renewal and modernization of the rolling stock will make it possible to improve all of these indicators and provide high-quality railway services.

The optimization of the work of BDZ Passengers will contribute to the rational and effective use of resources and improve the quality of the provided transport service significantly. This in turn will help increase the number of transported passengers and the company revenue. In order for the overall transport service to be improved, operating activities need to be optimized and staff qualification needs to be increased. This will help reduce the negative effects pertaining to delays, ticket sales, insufficient information provision and sanitation. To that end, the development of railway transport needs to be prioritized due to the unquestionable advantages it has over road transport, especially in terms of medium and long distances, as well as putting it in charge of intelligent and sustainable mobility. The mission of BDZ Passengers is to provide high-quality, comfortable and safe transport services, maintain and repair the rolling stock through efficient management based on leadership and system approach to management processes.

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