

WALDEMAR PARKITNY*

ANALYSIS OF QUALITATIVE CRITERIA FOR RAILWAY PASSENGER TRANSPORT BETWEEN CHOSEN VOIVODESHIP CITIES

ANALIZA KRYTERIÓW JAKOŚCIOWYCH DLA KOLEJOWEGO TRANSPORTU PASAŻERSKIEGO MIĘDZY WYBRANYMI MIASTAMI WOJEWÓDZKIMI

Abstract

The article presents an attempt to use synthetic and partial qualitative criteria to analyse the qualitative workings of railway transport enterprises providing passenger transport on the Kraków–Katowice route. Both cities are capitals of the largest industrial, scientific, cultural, touristic and trade centres in the south of Poland. They are placed a small distance from each other, and thanks to a well developed road and railway net, a quick journey between those cities is theoretically possible.

Keywords: quality, competition in transport, standard of trip, demand on transport services, synthetic and partial qualitative criteria in transportation, passenger railway transport, transport offer

Streszczenie

W artykule przedstawiono próbę wykorzystania syntetycznych i cząstkowych kryteriów jakościowych do jakościowej analizy funkcjonowania przedsiębiorstw transportu kolejowego świadczących usługi transportu pasażerskiego na trasie Kraków–Katowice. Oba miasta są stolicami największych przemysłowych, naukowych, kulturowych, turystycznych i handlowych centrów w południowej Polsce. Znajdują się one w niewielkiej odległości od siebie, a dzięki dobrze rozwiniętej sieci drogowej i kolejowej szybka podróż między tymi miastami jest teoretycznie możliwa.

Słowa kluczowe: jakość, konkurencja w transporcie, standard podróży, popyt na usługi transportowe, syntetyczne i cząstkowe kryteria jakościowe w transporcie, transport kolejowy pasażerski, oferta transportu

* Ph.D. Eng. Waldemar Parkitny, Zakład Transportu, Faculty of Civil Engineering, Cracow University of Technology.

1. Introduction

The article deals with the situation on the market of railway passenger transport on the Kraków–Katowice route with regard to factors influencing the quality of transport service. Both cities are capitals of voivodeships in which scientific, cultural, industrial and academic life focuses. Moreover, Kraków as the former capital of Poland, is a touristic city well-known in the whole world. Qualitative workings, undertaken by road carriers, aiming at taking over passengers on the discussed route, were described in “Technical Transactions” No. 7-M/2012 in the article entitled *Quality and competition in passenger transport. Case study for passenger road transport* [5], while functioning of railway carrier till the year 2010.

2. Investigative problem and aims of study

The following synthetic criteria of quality, referring to the quality of transport services for passenger transport in cities, are enlisted by Starowicz [12]: accessibility, time of trip, conditions, reliability, ecology.

The aim of the study is a trial of utilization mentioned criteria to qualitative analysis of railway transport enterprises realizing passenger carriage on the route Kraków–Katowice, describing the present state and its estimation.

Transport in that section has been realized by railway (Regio and Inter Regio trains started by Przewozy Regionalne and TLK as well as EC PKP trains started by Intercity S.A.) and bus connections.

The need for analysis came into being as a result of growing criticism relating to the quality of railway services which appeared several years ago in media. The author noticed, that the gap which has originated in consequence of decreasing of passenger train number and extension of their ride times, has been filled by road hauliers offering quicker and often cheaper connections.

3. Range of investigations

The investigations comprised all direct connections between Kraków and Katowice. There have been studied road and railway connections executed by collective transportation.

Different kinds of railway connections being made by railway hauliers in years 2010–2013 as well as road hauliers were examined [5].

4. Investigative methods

The author applied the following investigative methods: observation; analysis of passenger collective road [5] railway transportation hauliers’ offers [5] – analysis of individual hauliers time-schedules in different years and periods of their being in force; analysis of transport fares; measurements of real times of rides; random interviews with the hauliers’ workers and passengers.

5. Form and range of study

Author assumed, that the study would use described in literature, synthetic and partial qualitative criteria, to analysis of qualitative workings of railway transport enterprises, realizing passenger transports on discussed route. Individual criteria were compared with existing state. Descriptive form of study completed with suitable comparisons in tables has been assumed.

6. Analysis of railway passenger transport services quality basing on assumed investigative methods

The synthetic criterion of accessibility consists of, among other things, the number and share of inhabitants who are in the zone of convenient accessibility to the line of collective transport. In the case of inter-regional connections, the maximum distance travellers are prone to travel to get to the railway station, is 15–20 km. Because that distance makes about 1/4 of the distance between Kraków and Katowice, one can assume passengers would be people living in localities in which trains stop as well as some people realizing obligatory rides, coming to railway stations by passenger cars and continuing their journey by train. Park & Ride car parks situated near the railway stations (e.g. in case of Krzeszowice or Trzebinia) facilitate this way of travelling [2, 8].

Another criterion of quality are connections which allow easiness of making transfers to other means of collective transportation and to passenger cars. Treating a journey on the discussed distance as an indirect one, changing trains in Katowice in the case of a change of platform, would be possible through use of the tunnel and stairs. In Kraków, travellers could use the passage with a tunnel or through the car park located over the platforms. In both cities, using a lift is difficult because of lasting overhauls.

Before the reconstruction of the main station in Katowice in 2010, access to vehicles of municipal transport was better there than in Kraków, but it required using the numerous steep stairs of the flyover. In Kraków, municipal transport stops were situated in several places and some distance from the main station. Qualitative parameters such as access time and time lost on changing trains have been lengthened because of the big distance of the railway station from the municipal transport stops in Kraków, as well as removing the station of municipal communication placed near the main railway station in Katowice in autumn 2010 on account of reconstruction of the main railway station and replacing that with the pavillion on Plac Oddziałów Młodzieży Powstańczej.

Information as well as timetable also belong to accessibility as quality criterion. Timetable realization influences other quality criteria, that is disposability, time and continuity of action (less important in interregional transport, especially facultative). Information was given by means of timetables in the railway station hall, paper timetables and electronic displays on platforms, oral announcements, by the internet and book timetables. After the beginning of Katowice railway station reconstruction, the train departures information displayed on the platforms did not always work properly.

For people using railway connections often, their frequency and regularity are important. In Tables 1 and 2, train departures in each year have been presented and Table 3 presents their number and average frequency.

The analysis of subsequent timetables shows a systematic decrease in the number of connections and an increase in the travel time.

Table 1

Chosen timetables of trains – departures from Kraków to Katowice

Timetable of TLK trains	Timetable of PR trains	Timetable of IR trains	Timetable of IC WAWEL trains
before the change of timetable in December 2010:			
2.33 5.21 5.35	3.54 5.07 6.47	6.05 9.05 13.05	7.24
6.35 7.40 8.35	7.35 9.44 12.36	14.05 15.05 17.05	
9.35 11.35 12.19	13.41 14.18 15.18		
13.35 14.35 15.35	16.16 17.44 20.35		
16.35 17.35 19.35			
19.42 21.54			
after the change of timetable in December 2010:			
0.51 5.28 6.28	3.49 5.10 6.15	6.10 10.35 11.45	7.30
7.35 9.28 11.28	8.55 11.56 14.15	13.10 15.35 18.17	
12.28 13.28 14.28	15.15 17.15 20.15	19.25	
16.28 17.28 18.28			
19.55 20.26 21.45			
timetable valid from 1.08.2011:			
0.51 5.28 6.28	3.49 5.10 6.15	6.10 8.42 10.35	7.30
7.35 9.28 11.28	8.55 11.56 ^{*)} 13.15 ^{*)}	13.40 18.28	
12.37 14.28 16.45	14.15 15.15 16.15	20.56 runs in Sunday	
17.38 18.33 20.28	17.15 20.35		
21.14 21.45 22.43 23.42	^{*)} – runs from Monday – Friday except holidays (feasts)		
timetable valid from 1.03.2012:			
5.00 6.02 7.01	3.40 5.11 6.11	8.20 9.36	7.08
10.36 12.50 14.11	8.12 12.11 14.00		
16.09 16.58 ^{*)} 18.00	16.19 20.05		
18.46 ^{*)} 21.38 ^{*)} 22.06			
23.21 ^{*)} – periodical			
timetable valid from 10.06.2013:			
6.10 8.13 10.23	3.32 5.12 14.46	9.27 10.05 bus	
12.36 14.58 18.20	16.23 20.40	10.06 bus ^{*)}	
21.25		18.30 bus	

Source: author's study on the grounds of data available on: www.rozklad-pkp.pl, PKP PLK S.A., PKP Intercity S.A.

Table 2

Chosen timetables of trains – departures from Katowice to Kraków

Timetable of TLK trains	Timetable of Regio trains	Timetable of IR trains	Timetable of EC WAWEL trains
before the change of timetable in December 2010:			
1.25 4.22 5.07	5.35 6.35 7.42	6.53 10.15 11.15	17.57
7.20 7.55 9.05	8.45 10.46 13.42	12.15 14.15 16.15	
9.55 10.55 11.55	14.42 15.42 16.42	18.15 19.19 20.40	
12.55 13.55 14.55	17.42 18.42 19.58		
15.55 16.55 18.55			
20.25 20.53 21.55			
after the change of timetable in December 2010:			
1.29 4.45 4.55	5.40 6.40 7.40	9.46 11.47 14.50	17.55
6.52 7.15 8.15	8.40 10.40 13.40	17.18 18.55 19.41	
10.15 11.15 12.15	14.40 15.40 16.40		
13.15 14.15 16.15	17.40 18.40		
18.16 19.15 20.15			
timetable valid from 1.08.2011:			
1.56 3.20 4.45	5.40 6.40 7.40 ^{*)}	6.27 ^{*)} 9.46 ^{**)}	17.55 except
5.55 6.15 6.34 ^{*)}	8.40 10.40 13.40	11.47 14.49 17.18	23, 24.VI.2011
7.21 8.15 10.15	14.40 15.40 ^{*)} 16.40	18.55	
11.15 12.15 14.15 16.15 ^{*)} 18.16 19.15	17.40 18.40 ^{*)}	^{*)} – runs on Saturday and 1, 11.XI, except 12.XI.11	
20.15		^{**)} – kurs w pn od 5.IX	
^{*)} – runs to Kraków Płaszów	^{*)} – runs from Monday – Friday except holidays (feasts)	2.XI.11, does not run 31.X.11	
timetable valid from 1.03.2012:			
2.02 4.27 5.23 ^{*)}	5.19 6.28 7.24	16.52	17.50
6.32 ^{*)} 8.39 9.30	8.17 13.28 14.17		
10.27 11.56 12.27	15.27 16.18 18.30		
14.54 16.27 18.38	19.08		
19.41 20.30			
^{*)} – periodical			
timetable valid on 10.06.2013:			
3.20 4.47 9.08	5.17 7.25 14.24	7.30 bus, 9.30 bus	
10.45 13.13 14.59	15.07 16.11 18.22	12.15 bus, 14.05 bus	
18.12 21.23		17.40 bus, 18.44 bus ^{*)}	

Source: author's study on the grounds of data available on: www.rozklad-pkp.pl, PKP PLK S.A., PKP Intercity S.A.

Number (n) and frequency (f) of running trains for different timetables

n	f	TLK trains	Regio trains	IR trains	EC WAWEL trains
from Kraków to Katowice:					
A	–	17	12	6	1
B	–	15	9	7	1
C	–	16	9+2 z ²⁾	5+1 ⁹⁾	1
D	–	10+3 ^{*)} – periodical	8	2	1
E	–	7	5	1+3 ^{*)} – bus	0
–	A	85 min.	120 min.	240 min.	1440 min.
–	B	96 min.	160 min.	206 min.	1440 min.
–	C	90 min.	160/131 min. z ²⁾	288/240 min. z ⁹⁾	1440 min.
–	D	144/111 with periodical	180 min.	720 min.	1440 min.
–	E	206 min.	288 min.	360 min. with bus	lack of connection
from Katowice to Kraków:					
A	–	18	12	9	1
B	–	15	11	6	1
C	–	14 + 2 ¹⁾	8+3 ²⁾	4+1 ³⁾ +1 ⁴⁾	1
D	–	12+2 ⁵⁾ – periodical	10	1	1
E	–	8	6	6 – connection by bus	0
–	A	80 min.	120 min.	160 min.	1440 min.
–	B	96 min.	120 min.	131 min.	1440 min.
–	C	103 ⁵⁾ /90 min. ⁶⁾	180/131 min. ⁷⁾	360/288 min. z ³⁾ / z 240 min. ⁴⁾	1440 min.
–	D	120 min./103 min. ⁸⁾ with periodical	144 min.	1440 min.	1440 min.
–	E	180 min.	240 min.	240 min. – connection by bus	lack of connection
Source: author's study on the grounds of data available on: www.rozklad-pkp.pl , PKP PLK S.A., PKP Intercity S.A.					

where: n in first column means:

A – before the change of timetable in December 2010,

B – after the change of timetable in December 2010,

D – timetable valid from 1.03.2012,

C – timetable valid from 1.08.2011,

E – timetable on 10.06.2013,

¹⁾ runs to Kraków Płaszów,

²⁾ runs Mondays–Fridays without holidays (feasts),

³⁾ runs on Saturday and 1, 11.XI, except 12.XI.11,

⁴⁾ runs on Mondays from 5.IX and 2.XI.11, does not run 31.X.11,

⁵⁾ without runs to Kraków Płaszów,

⁶⁾ with runs to Kraków Płaszów,

⁷⁾ with runs from Mondays–Fridays without holidays (feasts),

⁸⁾ with periodical trains,

⁹⁾ runs on Sunday.

A quality parameter that should be connected with travel time is ticket price, which should correspond with the travel conditions, such as, for example: comfort in the train; getting on and off conditions; moving conditions; staff politeness etc.

Travellers of the second class passenger train travelling the 78 km distance from Krakow to Katowice paid 17.10 zł. The Inter Regio trains were more expensive. The second class ticket cost 18.90 zł. These trains, like the former ones, were Przewozy Regionalne (PR) owned and they were fast passenger trains.

The cost of a similar journey by Tanie Linie Kolejowe (TLK) was 23 zł for second class and 35 zł for first class (2013).

Unfortunately, the higher cost does not equal a higher level of service. One of the basic parameters that influences the connection quality assessment is the travel time between the places discussed. This time, according to the old internet timetable of 2010 ranged from 102 min. for the Inter Regio train to 125 min. for the passenger train (Regio). The new timetable extended that time even more from 110 min. for the EC train to 125 min. for TLK trains travelling from Katowice to Krakow, as well as from 103 min. for the EC train to 121 min. for both TLK and Regio trains. The given times are however theoretical ones, it happened quite often that the real travel time reached even 140 min. and the trains were delayed even at the beginning of the journey. This equates to a speed of 33,5 km/h.

The analysis of a chosen timetable of 2011 (valid from 1.08.2011) shows that the expected journey times on the Katowice–Kraków Główny distance were 120–121 min. for PR trains, 115–123 min. for TLK trains, 113–118 min. for Inter Regio trains and 112 min. for the EC Wawel train. Journey times in the opposite direction were 116–121 min. for PR trains, 109–123 min. for TLK trains, 106–109 min. for Inter Regio trains and 103 min. for the EC Wawel train. As can be observed, the travel time from Katowice to Kraków is slightly longer and the travel time of different types of trains is similar, even for the more expensive EC trains, whose travel time was not much shorter from that of the significantly cheaper Inter Regio trains.

Journey times on the Katowice–Krakow in 2012 (example timetable valid from 1.03.2012) were 134–151 min. for PR trains, 120–151 min. for TLK trains, 137 min. for Inter Regio trains and 124 min. for the EC Wawel train. Journey times from Kraków to Katowice, according to the timetable valid from 1.03.2012, were 125–140 min. for PR trains, 121–143 min. for TLK trains, 126–129 min. for Inter Regio trains and 121 min. for the EC Wawel train. A shorter planned time from Kraków to Katowice can be observed here, too.

Trains going from Katowice to Kraków, according to the timetable of 10.06.2013, reached their destination in: PR: 137–151 minutes; TLK: 139–153 minutes; Inter Regio trains did not run and were replaced by buses with a journey time of 75 minutes. Journey times from Kraków to Katowice were: PR: 135–152 minutes; TLK: 133–145 minutes; Inter Regio: 136 minutes. It is important to pay attention to the fact that some of the railway connections, including those being realized by Inter Regio, were replaced (like in the case of the journey in the opposite direction) by bus connections, with a travel time of only 73–75 minutes, and so about 2 times shorter than the railway connections. Buses realized their ride on a highway, without any breaks. The same discounts as in trains were valid there and tickets could be bought from the conductor on the vehicle.

The analysis of the above mentioned data suggests 3 conclusions:

- 1) seeing that the travel time of different types and different train carriers is almost equal, trains being counterparts of former fast or express trains (TLK, Inter Regio, EC) have lost their main advantage which was a shorter travel time,
- 2) buying much more expensive ticket for TLK, Inter Regio and EC trains is not economical on the basis that the most important factor which is reduced travel time on such a short distance,
- 3) while comparing prices and travel times of railway and road connections, the choice of road connections is much more economical.

For comparison, it is proper to quote the results of different investigations relating to the quality of railway services. Those investigations have been made by the questionnaire method “distributed to travellers after getting on the train with the request to fill them in during the journey. Thanks to that, one could be certain that answers to the questions had been given by people who really used the defined connection and were able to estimate particular in a reliable way the qualitative parameters asked about in the questionnaire” [9].

The investigation was executed for the route Kraków Główny–Warszawa Centralna for the following train types: Inter Regio of Przewozy Regionalne; TLK PK Intercity; EIC PKP Intercity; Tarnów–Nowy Sącz for the following train types – RegioPlus of Przewozy Regionalne and REGIO of Przewozy Regionalne; as well as for the route Kraków Główny–Częstochowa for TLK PKP Intercity trains [1]. The investigated passengers had to estimate the qualitative parameters mentioned in the questionnaire on a 1–5 scale, where 1 marked the weakest opinion and 5 the best opinion.

The general degree of satisfaction for all kinds of trains and routes was 3,41, and connections on the route Kraków–Warszawa of TLK PKP Intercity gained the most points – 3.65.

In the ranking of the total average marks for different carriers and routes, the travel time by train was in 7th place out of 11 analysed qualitative parameters (3.15 points from a maximum of 5), and it was the best result estimated on the Kraków Główny–Warszawa Centralna route, where trains are run by Centralna Magistrala Kolejowa. “However, even here, good marks were not gained. Maybe the consciousness of the fact that already some time ago, this route could be run in a time of even about 30 minutes shorter than now, caused that the dispersion of marks was from 3.32 to 3.79” [6, 7].

The frequency of trains was estimated even worse (10th place and 2.92 points). Ticket price achieved a considerably better 4th position (3.32 points). It is important to notice that on the section Kraków–Częstochowa, both the parameters received the worst marks of all (2.5 points for the frequency of trains running and 2.6 points for the travel time) which stand in contrast with the ranking of travellers’ preferences of W. Starowicz, in which the investigated travellers gave a high priority to the frequency of vehicles running; it gained a high 3rd place [12, p. 51].

The quoted results of the investigation can prove a large significance that travellers attribute to both frequency and travel time. Driving the highway between Katowice and Kraków takes from 55 minutes by bus at night to 80 minutes during the day. As such it is often comparable with the time of going through the city in rush hour. So, this journey becomes an interesting and competitive alternative as compared to, for example, purchasing

or renting a flat in a city to which the access is easier. This alternative is interesting for people forced to travel because of their workplace or their studies. In that situation, one can also suppose that travellers' preferences relating to municipal collective transport would be similar in discussed range to preferences in the range of trip in the discussed section.

The waiting time as a parameter of transport quality is connected with the frequency of vehicles running. This criterion can be significant in a situation where passengers did not manage to get on the vehicle because of over-crowding or they had been late and are waiting for the next train. In Table 3, the number and frequency of trains running by the timetables of the years 2010–2013 have been presented. Values given as times of departure are the average values for twenty-four hours and the actual waiting times for the next train of the same carrier are different depending on the time of day. Long waiting times, sometimes exceeding the journey time, can cause a change of carrier.

Other analysed qualitative criteria are time and continuity of action, including the night transport service, trains of TLK, operating also at night, have been better than road carriers running only during a day and in the evening till 2012 (Tab. 1 i 2).

Achievement of journey destination in a specified time is a qualitative criterion belonging to reliability. Considering this criterion, in the case of railway carriers there have been delays.

The stability of line arrangement and timetable belongs to the line arrangement, which is the next qualitative. In the case of railway carriers, lines arrangements are invariable, but in the discussed period there have been often timetable changes, being valid [13, 15, 16]: from 1.03.2011 to 31.05.2011, from 1.06.2011 to 31.08.2011, from 1.09.2011 to 28.10.2011, from 29.10.2011 to 10.12.2011, from 11.12.2011 to 31.03.2012, from 1.04.2012 to 31.05.2012, from 1.06.2012 to 28.06.2012, from 29.06.2012 to 2.09.2012, from 3.09.2012 to 15.10.2012, from 16.10.2012 to 8.12.2012, from 9.12.2012 to 9.02.2013, from 10.02.2013 to 13.04.2013, from 14.04.2013 to 8.06.2013, from 9.06.2013 to 1.09.2013, from 2.09.2013 to 19.10.2013, from 20.10.2013 to 14.12.2013. Apart from the changes mentioned above, corrections to timetable have additionally been made in the case of some connections, and there have been exclusions and seasonal changes in trains running, e.g. 6 for 13 trains of TLK from Kraków to Katowice, mentioned in the timetable valid from 11.10.2011, had additional changes of departure times. Because of that and the admissible content of the article, selected timetables were used in the present analysis.

The regularity of services is another qualitative parameter. TLK (in both directions) and Regio (from Katowice to Kraków) could boast the largest regularity in railway transport after the change of timetable in 2010 and 2011. Unfortunately, hours of departures in later years were irregular and timetables were difficult to remember.

In the case of ecological criteria, such as passengers' personal safety, it seems that road carriers are better, whereas according to statistics, the threat of accidents is smaller in the case of railway transport. Considering bad condition of tracks on the discussed section, railway transport can also be connected with noise and vibrations.

7. Recapitulation

Running a transport activity is connected with risk, which was documented in [3]. That risk consists of, among other things, a risk relating to competition's workings. It can be reduced, complying with proving rules of marketing. The basic tools of marketing are: product; price; promotion; distribution; staff [4]. Among the most often quoted definitions of quality, one can mention these, which say that quality is a collection of the characteristics of a product or service as well as the extent to which customers' expectations are fulfilled by them.

Since November 2012, travellers have been able to use a new railway station located at 3 Maja Street in Katowice. Unfortunately, reconstruction of some platforms, building a shopping centre, reconstruction of the street mentioned above and the exchange of tram track-ways have made using it difficult at the time of writing this paper. Investigations made in 14 cities in Poland show that the directness of trip, in other words, trips without any vehicle changes, is the most important factor from 10 studied features relating to preferences of the quality of collective transportation services [12, p. 51]. Removing of some municipal and agglomeration bus stops as well as interregional bus stops, previously situated directly near the station, in the location of the shopping centre that is currently being built, and the necessity of walking a considerable distance to the railway station, can be a factor which can discourage some travellers from using railway connections, especially the elderly, people of limited motoric possibilities as well as families with children.

As it appears from the analysis, railway carriers realize transport postulates mentioned above to a different degree. Factors which can be crucial in a relatively short distance, especially for obligatory transport, are low price and short journey time. Comparing the offers of railway carriers and road carriers, we can notice that two road carriers are especially active on that route, that is INTER Sp. z o. o. and Uni – The Bus, outweigh the offers of the railway carriers in respect to price (14 zł in 2013), time of journey (75–80 min.), frequency (twice an hour) and regularity (the same lapse of time – every half an hour – in both directions) [9, 10].

8. Conclusions

Among the most important conclusions, one can mention:

1. The majority of synthetic and partial qualitative criteria being applied in municipal collective transportation can be used to analyse qualitative workings of railway transport enterprises realizing passenger transports.
2. On the analysed section, a decrease in the number of rides being made, especially the cheapest connections by Regio, has been observed during last years. Those trains stop at all stations and passenger halts. The decrease in their numbers makes transportation with other localities difficult, especially in the case of obligatory trips.
3. The decrease in the number of train rides number is the accompnied by an extension of journey times and the increase of ticket prices, e.g. since 2011 till 2013 for passenger trains of 2nd class from 15 on 17.10 zł, from 16 on 18.90 zł for Inter Regio, from 19.50 on 23 zł for TLK, and for 1st class of TLK trains from 27 on 35 zł.

4. A significant improvement of used rolling-stock has not been noticed.
5. An intensification of road hauliers workings, which assure the shorter time of ride, low prices and better rolling stock has been observed.
6. All these factors can influence a change of passengers' transport habits and further decrease of railway transports part.
7. Workings tending towards modernization of exploited railway infrastructure on this section, assuring decided shortening of ride time and trip comfort improvement as well as the exchange of rolling-stock are essential.

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