PASSENGER TRANSPORTATION STRATEGY OF SC “LITHUANIAN RAILWAYS”

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Abstract. Transportation of passengers by the railway transport first of all is to be assessed not as a commercial, but as a social service necessary for the state seeking to ensure possibilities for society (especially for the lower-income society layer) to travel. Continuity of the passenger transportation activity is directly associated with the Lithuanian state transport policy and the insurance of necessary funding for this activity.

Keywords: Railway, SC “Lithuanian railways”, passenger transportation, perspectives.

1. Introduction

Transportation of passengers by the railway transport first of all is to be assessed not as a commercial, but as a social service necessary for the state seeking to ensure possibilities for society (especially for the lower-income society layer) to travel. The relevance of communication by train becomes evident with the growing flows of cars and with the increasing number of traffic jams on the roads, rising accident rate, pollution, and price of communication by the public transport (e.g. due to increase in the fuel price).

By transporting passengers by the railway transport significantly lower external costs are sustained than by the motor transport. With efficient operation of the railway transport, the following advantages of transportation by train per passenger may be distinguished, as compared with the motor transport: pollution of nature is ten times smaller, whereas with the use of electric traction, this advantage is even greater; no loss is sustained due to traffic jams on the roads; relative small loss due to traffic accidents (4.5 thousand accidents occurred on the roads during 11 months of 2008, and only 10 in the Lithuanian railways); no single Lithuanian railway passenger died during the last fifteen years, etc.

Income generated from the transportation of passengers by railways is smaller than the costs sustained. In the Western countries there are hardly several segments where the passenger transportation activity is not loss-making. This was conditioned by favourable geographic, urban and economic conditions for the development of the railway transport, as well as favourable state transport policy by making especially big state investments into the improvement of the railway transport infrastructure, rolling stock and the quality of passenger service.

Irrespective of the loss ratio of this activity, the EU countries adhere to the attitude that railways is a perspective transport mode that should be promoted in the passenger transportation field (because of its attractiveness in terms of environment protection, safety, and possibilities for solving motor transport accidents, traffic jams etc.). Old-timers operate in the passenger transportation market by strictly following the principle of the unbundling of activities required by the EU legal acts: state or municipal institutions assume a social responsibility – to compensate for the loss sustained by passenger carriers, also to finance the development of high-speed railway lines, programs for the renewal of the passenger rolling stock.

Transportation of passenger by the Lithuanian railways is greatly loss-making. The allocation of funds for reimbursing the loss due to passenger transportation was commenced from 2005, and even though financing is increasing, it is still relatively small. In 2008, hardly 15 per cent of the loss incurred in this activity was covered with the state funds. As a result, financing the immediate needs of the passenger transportation activity (current expenses and immediate investments) is done from the revenues generated by the freight transportation activity. Expenses of the freight carrier for financing the passenger transportation constitute approximately 10 per cent of the revenues from freight transportation, what greatly impairs the financial position of the Lithuanian railway freight carrier. With the sharpening competition in the freight transportation
Continuity of the passenger transportation activity is directly associated with the Lithuanian state transport policy and the insurance of necessary funding for this activity.

2. Factors restricting the volumes of passenger transportation by railways

There are the following factors:

1. Further motorization of the Lithuanian society (with the improvement of the residents’ standard of living). With the increasing residents’ standard of living, the share of residents able to acquire their own car increases. Until 2008, the number of private cars had been increasing in Lithuania by 5 per cent or more annually. The number of residents travelling by cars has doubled during the last ten years.

2. Lack of modern rolling stock. Due to the lack of funds, the renewal of the passenger rolling stock of SC „Lithuanian Railways” was insufficient within the period from 1990 till 2008. Passengers’ need for comfort has been increasing, meanwhile with the ageing of trains and failure to renew them, the comfort level in them has not improved but on the contrary, deteriorated.

   The program for the renewal of passenger trains is a long-term process. Investments require about 1 billion litas (at the 2008 price level).

3. Restrictions of traffic for passenger trains due to works carried out while implementing significant projects on upgrading the public railway infrastructure. E.g. when implementing a project for the renovation of the Kaunas railway tunnel, train traffic was stopped from 1 February 2008. The tunnel is planned to be opened in October 2009.

   Seeking to increase the train speed reconstruction is intended in the main lines of the Lithuanian railways. Therefore when implementing reconstruction, together with track improvement works it is necessary to organize train traffic in such a way that the passage of freight and passenger (at least the most important ones) trains was ensured.

4. Poor (not meeting the requirements for passenger transportation) railway infrastructure connecting the Lithuanian railway network with the Polish (and together with the Central and Western European) railway network. Before construction of the Rail Baltica (European gauge) line, SC „Lithuanian Railways” plan to renew the transportation of passengers in the direction of Poland by using modern and reliable gauge change equipment.

   Construction of the European gauge Rail Baltica line up to Marijampolė is planned to be finished by 2015, up to Kaunas – by 2018. It is expected that within respective terms, the Rail Baltica line will be reconstructed (or new sections will be constructed) in the territory of Poland.

3. Factors providing possibilities to increase the volumes of passenger transportation by railways

They are the following ones:

1. Growing number of traffic jams on motor ways; increase of accident rate on the roads. Such advantages of train with respect to the motor transport as punctuality, safety, reliability gain a real superiority upon existence of traffic jams on the roads. A real problem of traffic jams is expected in the nearest perspective (within a period of 3–5 years) at the approaches to the major cities of Lithuania (first of all Vilnius and Kaunas).

2. World-wide growth in fuel and other energy resources prices, increase of excise duties. The fuel price is the most important factor determining trips by the road transport vehicles. Fuel constitutes a much smaller portion in the operating self-cost of a passenger train than of the motor transport, therefore the effect of fuel price to the price for passenger transportation is smaller. This is an especially significant advantage in the case of electric trains. By developing the contact network in the Lithuanian railways in the future, the advantage of trains against the road transport will increase in Lithuania.

3. State regulation or its changes, favourable for developing the activities of passenger transportation by railways. It is anticipated that in the perspective:

   – the provisions of legal acts of the European Union and of the Republic of Lithuania (article 13 of the Law on the Fundamentals of Transport Activity, article 12 of the Railway Transport Code), associated with the regulation of implementation of the public service obligations will be fully implemented, i.e. a long-term agreement will be concluded between the institution authorized by the State (the Ministry of Communication) and SC „Lithuanian Railways”; wherein the routes necessary for public service, and the allocation of state funds for covering the loss associated with passenger transportation as well as acquisition of passenger rolling stock will be defined;

   – non-discriminative competitive conditions with respect to other transport modes will be established for the Lithuanian railways transport sector;

   – transport flows (first of all, of the public transport) will be balanced out.

   – the number of interurban transport duplicating the train routes will be reduced;

   – schedules of the suburban (city) public transport will be coordinated with the arrival/ departure time of trains. An essential drawback of the transportation of passengers by trains, as compared with the bus transport, is the absence of possibilities...
to carry passengers “from door-to door”; balanced out development of the railway and motor way infrastructures. At the railway stations, a convenient access by motor ways is ensured. As to the routes where the public railway is developed, the development of duplicating motor ways will be abandoned.

4. Perspectives of the passenger transportation activities

The dynamics of forecasted volumes of passengers travelling on local routes and kilometrage of local passenger trains by increasing the number of routes/journeys is provided in figure 1. The number of passengers travelling on local routes is expected to increase up to 14 million passengers (in 2030).

By the year 2015, the number of passengers will increase mostly due to the introduction (renewal) of new routes and intensification of the density of routes. Renewal of the passenger rolling stock fleet and upgrading of the railway infrastructure are long-term processes, therefore no sudden changes in improving the quality of passenger transportation are possible (increasing the speed, comfort of ride).

A marked increase in the number of passengers travelling by local railway routes is anticipated after the year 2015. This will be determined by the renewed passenger rolling stock fleet; introduction of a modern ticket booking and sales system; increased traffic jams on motor ways; increased fuel price; state transport policy encouraging travelling by train; upgrading of the railway sections Vilnius–Kaunas (subsequently, Kašiadorys–Šiauliai, Šiauliai–Klaipėda) after the implementation whereof the allowable speed for passenger trains will be increased in these routes (up to 160 km/h).

Seeking to improve the conditions for international communication, the development of passenger transportation by international trains formed by SC “Lithuanian Railways” is intended:

1) in the Eastern direction it is planned:
   – to continue the operation of trains Vilnius-Moscow, Vilnius–St. Petersburg, and Vilnius–Minsk. It is expected that with the increase in the number of passengers on the routes Vilnius–Moscow and Vilnius–Minsk about 2020, the number of trains will be increased from 1 to 2 during a 24 hour period;
   – to form a new international train for the route Vilnius–Kiev in the perspective;
2) in the North-South direction it is planned:
   – from 2010 to organize a train running on the route Vilnius–Riga;
   – from 2012–2013 to organize a train running on the route Vilnius–Kaunas–Warsaw, and then up to Berlin. Modern and reliable gauge change equipment is intended to be used on this route. The route mentioned will be able to operate also after the construction of the Rail Baltica line up to Marijampolė, and then up to Kaunas, by moving the gauge change mechanism. Approximately LTL 100 million of investments is necessary for the formation of two trains with a variable gauge for the route Vilnius-Warsaw;
   – after construction of the European Rail Baltica gauge up to Kaunas (around 2018), to launch high speed trains from Kaunas in the direction of Poland. Their routes will be linked with trains on the 1 520 mm gauge network: a new international route Kaunas–Riga–(Tallinn) and local routes Vilnius–Kaunas, Kaunas–Šiauliai.

Due to market specificity (i.e. relatively small rates for the passenger transportation and small transportation volumes), international trains formed by SC „Lithuanian Railways“ are loss-making (the loss of over LTL30 million was incurred in 2008) and there are no possibilities to ensure not loss-making character of this activity by investment or any other measures (at least in the near future). State allocations are necessary for the pursuance and development of these activities.

Fig. 1. Volumes of passenger transportation on local routes by SC “Lithuanian Railways“ during 2008–2030
The dynamics of passenger transportation volumes on international routes is provided in figure 2. It is expected that the number of passengers travelling on international routes will increase from 1.0 million passengers (in 2008) up to 3 million (in 2030). A significant increase in the passenger transportation volumes is expected after construction of the European gauge Rail Baltica line up to the Kaunas passenger station (from 2018), when conditions for the transportation of passengers will be significantly improved.

Figure 3 provides information about the planned number of passenger trains by railway lines.

The following tasks have been raised for the attainment of strategic goals for the passenger transportation activity:

– To ensure capacities necessary for the development of the passenger transportation activities: sufficient capacities of the railway infrastructure and sufficient passenger rolling stock fleet.

– To ensure the compliance of service quality with the clients’ needs; to increase the accessibility of services.
Focus of the passenger transportation activity on the client’s needs is the only way to increase attractiveness of the railway carrier and to attract the clients. The following characteristics important for the passenger have been distinguished: travel time; convenience of the train schedule; train punctuality; conditions of the comfort of ride; accessibility of the service (possibilities to obtain information and to acquire tickets by electronic means; common tickets with other types of public transportation, etc.)

By focussing on the clients’ needs, the carrier will develop services for tourist routes.

– To enhance operational efficiency (to minimize operating costs).

Decrementing the loss of the passenger transportation activities is a necessary condition for the continuity of this activity in the company.

6. Measures for the attainment of the objectives set

The main measures for the attainment of objectives associated with the development of the passenger transportation activity of SC „Lithuanian Railways“ are the following ones: balanced investment program; activation of marketing activities in the passenger transportation field by the company; refusal of the thermal traction for local (near) communication routes;

Balanced investment program – is an essential measure for ensuring necessary capacities for the passenger transportation activities. It is also very important for enhancing operational efficiency of the passenger transportation activities and developing the services to meet the clients’ needs.

The investment program intended for developing the passenger transportation activity covers:

1) renewal, upgrading and development of the passenger transportation economy, including renewal, upgrading and development of the passenger rolling stock fleet and, respectively, its repair and maintenance facilities;

2) renewal, upgrading and development of the railway infrastructure (together with its maintenance facilities) for ensuring train capacity and traffic safety, increasing train speed, enhancing operational efficiency of the carrier’s activities;

3) development of information technologies.

Activation of marketing activities in the passenger transportation field by the company. Seeking to fully utilize the available opportunities and to find out ways to reach the client (to increase the loyalty of existing clients, to attract new clients), the company will activate its activities in the marketing field. The range of promotion measures (advertising, etc.) and the intensity of their application will be expanded. Decisions regarding the services price, schedule optimization, service quality improvement, additional services, service accessibility enhancement will be taken on the basis of comprehensive market studies.

The company will strengthen and/or create new marketing units of the passenger transportation activity, especially for the passenger transportation activity in the direction of Poland (Central and Western Europe).

Refusal of the thermal traction for local (near) communication routes. Passenger transportation using thermal traction (by forming trains from different wagons hauled by a diesel locomotive) is the most expensive way for the transportation of passengers - costs associated with the wagon facilities and locomotive facilities are sustained, also teams of conductors are to be employed for serving the wagons. Such transportation of passengers is cost efficient only in long distances, by forming long train units, whereas in local carriages it is more efficient to use modular trains. SC „Lithuanian Railways“ use thermal traction for short-distances on the routes Vilnius–Klaipėda, Vilnius–Minsk. By launching new diesel trains, refusal of the thermal traction on these routes is planned from 2011–2013 (this way avoiding investments into the new passenger locomotives, passenger wagon fleet), what will enable to reduce operational costs of the routes mentioned (by LTL 3–5 million annually).

Other measures for enhancing operational efficiency of the passenger transportation activity. Organizational and other measures necessary for improving the quality of passenger transportation services and minimizing the costs by ensuring a safe and reliable train traffic, improving operational performance of the rolling stock, depots, increasing the efficiency of infrastructure maintenance and repair works, and using available resources in an efficient way: advancing professional skills of employees; improving the motivation system; optimizing informational flows; improving the organizational structure, optimizing the distribution of functions and works among units of the company; optimising technological processes, etc.

These measures are concretized in the short-term plans of the company and its units.

Main directions for the upgrading and development of the passenger transportation economy: renewal of the electric train fleet; renewal of the diesel train fleet; renewal of the passenger wagon fleet; renewal of the passenger locomotive fleet; acquisition of passenger rolling stock for routes in the direction of Poland (Rail Baltica).

Renewal of the electric train fleet. In 2008, SC „Lithuanian Railways“ operated 13 electric trains. An average year of make of self-propelled electric train wagons and trailer cars in operation is 1977. The existing rolling stock is of poor technical condition and fails to meet the comfort requirements. With consideration to the current condition of electric trains, their operational reserve is expected to expire by the years 2013–2014. Dynamics of the electric train fleet is provided in figure 4.
SC “Lithuanian Railways” started a program for the renewal of the electric train fleet, and two new double-deck electric trains were acquired from the Czech manufacturer, of which the first one was launched in December 2008. The new electric trains meet modern requirements: the design speed is 160 km/h; better acceleration characteristics; high level of comfort.

By 2015, SC “Lithuanian Railways” plan to acquire new trains for renewing the old fleet. 14 new electric trains will be acquired (including the ones being acquired according to the already signed contract with ČKD VAGONKA A.S.) designated the local communication routes Vilnius (Naujoji Vilnia)–Kaunas, Vilnius (Naujoji Vilnia)–Trakai.

After developing the contact electricity network in the section Kena–Kybartai by 2020, and in the section Kaišiadorys–Klaipėda by 2024, new electric trains will be acquired for work in the newly electrified lines (IX corridor).

Renewal of the diesel train fleet. In 2008, SC “Lithuanian Railways” operated 33 diesel trains and 1 rail car. 12 diesel trains were upgraded. The general technical condition of the fleet is very poor. The operation reserve of trains (their wagons) is expiring within the 2008–2020 period (for the majority of them the reserve expires in 2009–2015). The existing fleet does not meet the passengers’ needs for comfort. Urgent renewal thereof is necessary. Dynamics of the diesel train passenger fleet is provided in figure 5.

SC „Lithuanian Railways“ started a program for the renewal of the diesel train fleet:

– according to the agreement with TMHB signed in 2007, 4 new diesel trains are acquired (4 trains with 2 wagons each, and 2 trailer cars). Operation of the trains was commenced in 2008. These trains will change D1 trains that are being written-off. New diesel trains are more efficient (fuel costs are less by 30 per cent, and the cost of lubricants are smaller by 4 times), as well as more comfortable than the old ones;
According to the agreement with the Polish factory PESA Bydgoszcz Spolka Akcyjna Holding, 2 rail cars were acquired which operation was launched in the autumn of 2008.

During the 2010–2017 year period, an intensive renewal of the diesel train fleet aimed at replacing the old fleet – acquisition of more than 20 new diesel trains and/or rail cars – is intended.

During 2011–2013, acquisition of 3 new (each with 10 wagons) diesel trains designated for the route Vilnius–Klaipėda is planned (by refusing the thermal traction for local carriages).

During subsequent periods, no development of the diesel train fleet is planned. Having developed the electric network, the company will develop the electric train fleet.

Renewal of the passenger wagon fleet. In 2008, SC “Lithuanian Railways” operated ~140 passenger wagons. Among the wagons used in operation there were wagons made in the years 1971–1974 which operational reserve expires in the near future.

During the 2010–2020 year period, renewal of the whole passenger wagon fleet of the company is planned by replacing the worn out wagons with the new or upgraded ones. Dynamics of the passenger wagon fleet is provided in figure 6.

By optimizing the use of passenger wagons, plans have been made to organize activities by operating ~85 passenger wagons. The need for passenger wagons will decrease due to refusal of the thermal traction on local routes.

Renewal of the passenger locomotive fleet. In 2008, SC “Lithuanian Railways” operated 18 passenger diesel locomotives in total, of which 9 (TEP-60) are in very poor condition, and they are planned to be written off in the years 2009–2012. During this period, refusal of the thermal traction on local routes, and acquisition of new modular trains is planned. This way the company will ensure the need for diesel locomotives only for the service of international trains.

Dynamics of the passenger locomotive fleet is provided in figure 7.
During 2010–2011, acquisition of new passenger locomotives for the replacement of the worn out vehicles is planned.

From 2020 (after electrification of the line Kena–Kybartai), acquisition of passenger electric locomotives for serving international trains is planned. Written-off depreciated locomotives will be replaced with electric locomotives after 2020.

Rolling stock for passenger trains in the direction of Poland (Rail Baltica). For renewing the route Vilnius–Warsaw (in the perspective Vilnius–Warsaw–Berlin), the acquisition of 2 passenger trains with a modern variable gauge equipment is planned in 2011. After constructing Rail Baltica up to Marijampolė and up to Kaunas, these trains will be used on the route Vilnius–Warsaw by respectively moving the gauge change equipment to Marijampolė or Kaunas. One train with a variable gauge may be used, as a standby train, for the route Vilnius–Klaipėda.

After constructing Rail Baltica up to Kaunas (~2018) and developing the transportation of passengers on the route Kaunas-Warsaw, acquisition of 2 high speed 1 435 mm gauge trains is planned. The company will either acquire these trains itself, or together with partners/partakers (depending on the form of organizing activities in the Rail Baltica line).

7. Preliminary need for funds for investment into the passenger transportation economy

The need for funds for investments into the passenger transportation economy by SC „Lithuanian Railways“ amounts to LTL 1,9 billion (at the 2008 price level). Distribution of investment for the renewal and development of the passenger transportation economy by key directions of investments is provided in figure 8.

Based on distribution of the need for funds into investments by years, the biggest need for funds will be in the years 2008–2015. During this period the reserve of the major part of SC “Lithuanian Railways” rolling stock (electric, diesel trains, passenger wagens and passenger diesel locomotives operated in 2007) will be expired, and their replacement with the new or upgraded vehicles will be implemented.

During this period the forming of the train Vilnius–Warsaw is intended. The need for funds for the acquisition of 2 modern trains with a variable gauge system amounts to approximately LTL 100 million. With consideration to the fact that a train is formed with a view of satisfying interests of the state (the company will not have any commercial gain), implementation of the project is planned only after receipt of the state funding. Besides, during the 2008–2015 period plans have been made to refuse of the thermal tractions for local carriages. To this effect, 3 modular trains are necessary. It has been estimated that approximately LTL 100 million will be necessary for their acquisition. After the year 2015, renewal of the major part of the rolling stock fleet will be completed; therefore the level of investment into the passenger rolling stock fleet will be significantly reduced during the years 2016–2022.

In 2023–2030, an essential part of investment will consist of the acquisition of additional electric trains after electrifying the main corridors. With the decrease in the need for diesel trains, no funds are intended for their renewal or development.

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**Fig. 8. Need for investment into the passenger transportation economy by investment directions and years**
8. Financial results of the passenger transportation activity and the need for state funding in the years 2008–2030

It is planned that due to increase in the number of passengers and minimization of costs owing to investment, marketing and other measures for optimizing activities, loss ratio of this activity will be reduced in the future. Nevertheless, after assessing experience of the European railways and the specificity of Lithuania (railway network, resident density) which is not favorable for the transportation of passengers by railways as a commercial activity, we cannot expect that this activity will become profitable and implemented without the state subsidies.

Based on preliminary calculations, after renewal and development of the passenger transportation activity, the loss could be reduced by 2–3 times (from LTL 150 million down to 50–70 million), as well as the need for state funding accordingly.

9. Research methods

When forecasting the passenger carriages (the number of trains or their occupancy) by the railway transport up to 2030, the following scientific research methods have been used: systemic analysis; analogy; expert assessments; statistical analysis, extrapolation and spatial simulation.

5. Conclusions

1. By reducing the loss of passenger transportation on local routes, the main attention will be paid to the use of electric tractions at the same time improving environmental conditions.

2. To balance out the interaction of all transport modes on the state level by using the railways in the most optimal way in this chain.

References


