Līdzfinansējusi Eiropas Savienība
Eiropas Transporta tīkls (TEN-T)

Detailed technical study and environmental impact assessment of the Latvian section of the European gauge railway line Rail Baltica

ID No. SAM 2012/12 TEN-T

FINAL REPORT

Summary

2016.

Contracting Authority:	**Ministry of Transport of the Republic of Latvia** 3 Gogoļa Street, Riga, LV-1743
Contractor:	**General partnership „RB Latvija“**
Registered address	240-3, Maskavas Street Riga, LV- 1063
Phone	+371 67524170
Fax	+371 67524172
Contact	Arnis Skrastiņš
E-mail	arnis.skrastins@kb-l.lv
Submitted (Contractor):	**General partnership „RB Latvija“** Authorised person A.Skrastiņš _____
Received (Contracting Authority):	Railway Department at the Ministry of Transport Project manager K.Vingris _____

31/08/2016

The present document was elaborated by the general partnership „RB Latvija“. The information contained within it is intended to be used for the purposes of the agreement „Detailed technical study and environmental impact assessment of the Latvian section of the European gauge railway line Rail Baltica“ (ID No. SAM 2012/12 TEN-T) concluded by and between the Contracting Authority and GP „RB Latvija“ on 30 April 2014.
The report includes all and any deliverables according to the Terms of Reference. Any statement, assumption, and opinion mentioned in the report shall be considered taking the context of the report into account. Chapters not included in the report are included in the Final report.

Table of contents

ABBREVIATIONS AND TERMS

Accepted railway line route	the alignment option accepted by the Cabinet of Ministers of the Republic of Latvia (Act No. 467, 24.08.2016) in accordance with the Law on Environment Impact Assessment
CBA	cost-benefit analysis
CEF	The Connecting Europe Facility
Common principles	a document approved by the three Baltic States (The Common principles for the Rail Baltica 1435 mm railway Spatial and Territorial Planning and Preliminary Design Study)
Contracting Authority	the Ministry of Transport (in accordance with Agreement No. SM 2014/-25 of 30/04/2014)
Contractor	general partnership „RB Latvija” (in accordance with Agreement No. SM 2014/-25 of 30/04/2014)
EC	European Commission
EE	Estonia
EIA	environmental impact assessment
ERTMS	European Rail Traffic Management System
ESB or the Bureau	Environmental State Bureau
ESIFs	European Structural and Investment Funds
EU	European Union
Feasibility study	the Feasibility study „Feasibility study on the European standard width railway line in Estonia, Latvia and Lithuania (Rail Baltica corridor)”. Title in English: "Feasibility study and technical studies of new European gauge line of Rail Baltica section Kaunas-Riga-Tallinn". The Feasibility study was carried out by AECOM Ltd being commissioned by the three countries – Estonia, Latvia, and Lithuania
GP	general partnership
GSM-R	Global System for Mobile Communications – Railway
JSC	joint stock company
LT	Lithuania
LV	Latvia
M 1: 10 000	scale 1: 10 000
Main railway line route alignment option	the alignment option selected following the consideration of all aspects (engineering, technology, environmental, legal, costs and benefits, etc.) for the new railway line to be built, and which has received a positive environmental impact assessment and has been approved by the Contracting Authority. Another abbreviation is also used in the text – recommended or preferred route
MCA	multi-criteria analysis
NATURA 2000	a network of protected areas across the European Union
PBI	Project Bond initiative
PLA	protected landscape area
Project	the construction of the new European gauge railway line Rail Baltica (the Latvian section)
Railway infrastructure	according to the Railway Law, railway infrastructure is a complex engineering installation, which comprises:) rails (tracks), switches, cross-ties, ballast, crossings and other components;) ground beneath tracks (earth structures and railway right of way) and engineered structures and installations (bridges,

support poles, road crossings, culverts, drainage installations, communication line conduits, retaining walls and protective walls and the like);
- boundary markings and protective plantings;
- railway signalling, central control and interlocking communications systems, facilities to ensure the safe movement of trains and the regulation of switch positions and signals, signal lights, signal indicators, and fixed signals;
- railway telecommunications networks;
- aerial and underground railway electric supply cables, catenary, transformer and traction substations;
- railway stations, passing and stopping places;
- buildings and structures necessary for the maintenance, repair and use of the railway infrastructure facilities.

SCCO or the Office	State Construction Control Office
SRTI or the Inspection	State Railway Technical Inspectorate
TEN-T	Trans-European Transport Network
ToR	Terms of Reference of Procurement No. SAM 2012/12 TEN-T
TPSS	traction power sub-station
TSI	technical specifications for interoperability
VIA Baltica	European road E67 linking Tallinn with Warsaw

INTRODUCTION

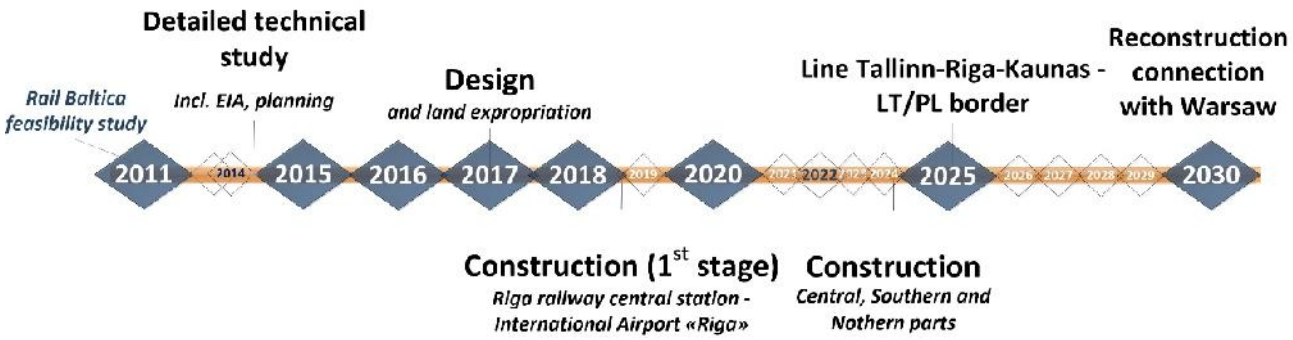
Rail Baltica is a public use railway transport infrastructure project, within which a new European gauge (1 435 mm) railway line will be built in the Baltic States, and which will connect Tallinn – Riga – Kaunas – Warsaw – Berlin. The route indirectly covers also Finland, which means the project affects also the Scandinavian countries. Rail Baltica is part of the TEN-T core network and the Adriatic Sea – Baltic Sea corridor, and is identified as a priority TEN-T project of the common interests of Europe.

In Latvia and the other two Baltic States, the present railway gauge width is the Russian standard 1 520 mm, while in the majority of the Member States the gauge width amounts to 1 435 mm. Therefore, the existing railway network and rolling stock in the Baltic States is not compatible with the railway network in Poland and Germany.

In 2011, the three Baltic States commissioned AECOM Ltd. to carry out the Feasibility study “Feasibility study on the European standard width railway line in Estonia, Latvia and Lithuania (Rail Baltica corridor)”, which included a recommendation regarding the preferred railway line route alignment.

In 2014 – 2015, the Baltic States carried out studies, planning, and an environmental impact assessment, and elaborated the engineering solutions for the envisaged railway line. The project shall be co-funded by the European Union. In 2015, the funding for Stage 1 of the project was received; in Latvia, this shall be used for the design and construction of the main section from Riga city centre to Riga International Airport. The whole Rail Baltica shall be completed by 2025 (Figure 1).

Figure 1 ***Implementation schedule of the Rail Baltica in Latvia***



Experts of the national study projects from Latvia, Lithuania and Estonia were in close cooperation and observed the Common principles for the Rail Baltica 1 435 mm Railway Spatial and Territorial Planning and Preliminary Design Study elaborated and approved by the Rail Baltica Task Force.

The national study for Latvia was carried out within the agreement concluded by and between the Ministry of Transport and the general partnership “RB Latvija” – “Detailed technical study and environmental impact assessment of the Latvian section of the European gauge railway line Rail Baltica” (ID No. SAM 2012/12 TEN-T) (*hereinafter – Detailed technical study or Study*).

The Detailed technical study is carried out within these projects co-funded by the European Union:

- “Studies on the European gauge railway line (Latvian section)”, Project No.2007-LV-27050-S. On 11 December 2008 the European Commission adapted Decision C(2008) 7978 granting the Community financial aid for projects of common interest “Studies on the European gauge

railway line (Latvian section” – 2007-LV-7050-S the field of the Trans-European Transport Network;

- “Preliminary design and operations studies for Rail Baltica railway line Latvian section”, Project No. 2012-LV-27120-S. On 14 October 2013 the European Commission adapted Decision C(2013) 6876 granting the Community financial aid for projects of common interest “Preliminary design and operations studies for Rail Baltica railway line Latvian section” – 2012-LV-27120-S the field of the Trans-European Transport Network.

The summary of the Final report includes information regarding the results achieved and tasks carried out in the Detailed technical study. The summary is organised in accordance with the 10 (ten) work packages listed in the Terms of Reference of Procurement No. SAM 2012/12 TEN-T and covers a period of time from 30 April 2014 to 31 August 2016 (Figure 2).

The aim of the Detailed technical study was to determine the precise alignment of the railway line Rail Baltica in the territory of Latvia, including links to the port and airport, and to carry out relevant studies and preparatory works for the design of the railway line, expropriation of land, and commencing construction by 2020.

All and any engineering, technological, financial, socio-economic, legal and environmental aspects have been considered within the Detailed technical study in accordance with the aim of the Study.

In particular, in the Detailed technical study:

- **a precise alignment of the railway line Rail Baltica in the territory of Latvia has been determined;**
- **an environmental impact assessment of the railway line Rail Baltica has been done, and acceptance of the intended activity has been received;**
- **the railway line Rail Baltica has been defined as an object with the status of national interests;**
- **the documentation for the initiation of the construction process of Rail Baltica in Latvia has been prepared;**
- **all necessary calculations have been performed in order to be prepared for the next funding.**

The detailed technical study has reached the **Results** in accordance with the **technical specifications** of the:

- Technical solutions have been prepared for the technically, economically and legally possible alignment options of the planned railway line Rail Baltica;
- Engineering surveys have been performed in order to substantiate the technical solutions and the detailed technical solutions;
- Environmental impact assessment has been carried out in accordance with the legislative requirements;
- In the administrative territories (municipalities), where necessary, amendments to the municipal spatial plans have been made, the local spatial plans of the new railway line have been developed;
- A precise and substantiated from all aspects alignment of the new railway line has been chosen;
- Detailed technical solutions for the railway line route alignment and the technical documentation necessary to start the next stage of the project development – design and construction – in accordance with the Construction Law and the relevant laws and regulations have been elaborated;

- Recommendations for the expropriation of the land properties for the railway line route alignment have been elaborated, and amendments to the local municipal spatial plans have been made;
- The Terms of Reference and the requirements of the Contracting Authority for the design, construction, and related processes, including the design task, have been elaborated;
- A full cost – benefit analysis has been carried out for all the railway line alignment options, and their extra expenditures, income, socio-economic benefits, and losses compared to the option defined by the Feasibility study have been identified;
- A detailed CBA calculation model was prepared, and full CBA was carried out for the main railway line alignment option, incl. the calculation of the relevant EU co-funding, splitting the project into technically and economically separable implementation stages: from 2014 to 2020, considering the n+2 principle, and from the year 2021 onwards; a detailed project management and implementation plan has been prepared, including a schedule of works, time, and cash flow;
- The project has been structured into technically and economically separable construction projects, which can be implemented each on its own, thus ensuring a logical sequence of the construction stages within the project, incl. the construction objects set for the initiation of construction, following the implementation stages from 2014 to 2020, considering the n+2 principle, and from the year 2021 onwards.

The Study results have been prepared in accordance with the laws and regulations of the Republic of Latvia, incl. the engineering and design standards.

The Study is the critical stage in the Project development as it is determines the precise alignment of the railway line. Up to now the public attitude was mainly based on the idea of a healthier, environmentally-friendlier, and better means of transport. The Study “put” the railway line on particular properties, concerns particular interests, and involves particular public, private, and nongovernmental entities. In comparison with the Feasibility study in 2011, which demonstrated the approximate alignment of the option, work in the Detailed technical study from the beginning of EIA has been performed on a scale of 1: 10 000.

To arrive at the precise alignment of the railway line Rail Baltica, extensive communication with the stakeholders and the society was carried out during the Study. In every stage of the Study, numerous actions were taken – public meetings, work groups, work meetings, expert meetings to involve relevant institutions and to inform the society (Figure 3).

Figure 2 ***Work packages of the Detailed technical study***

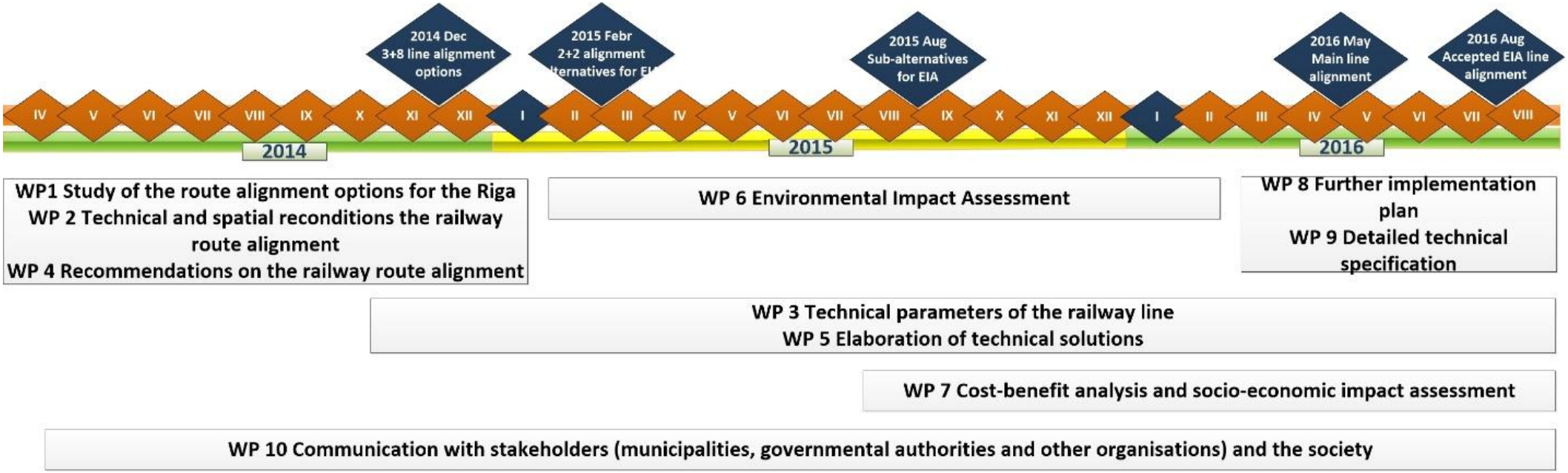
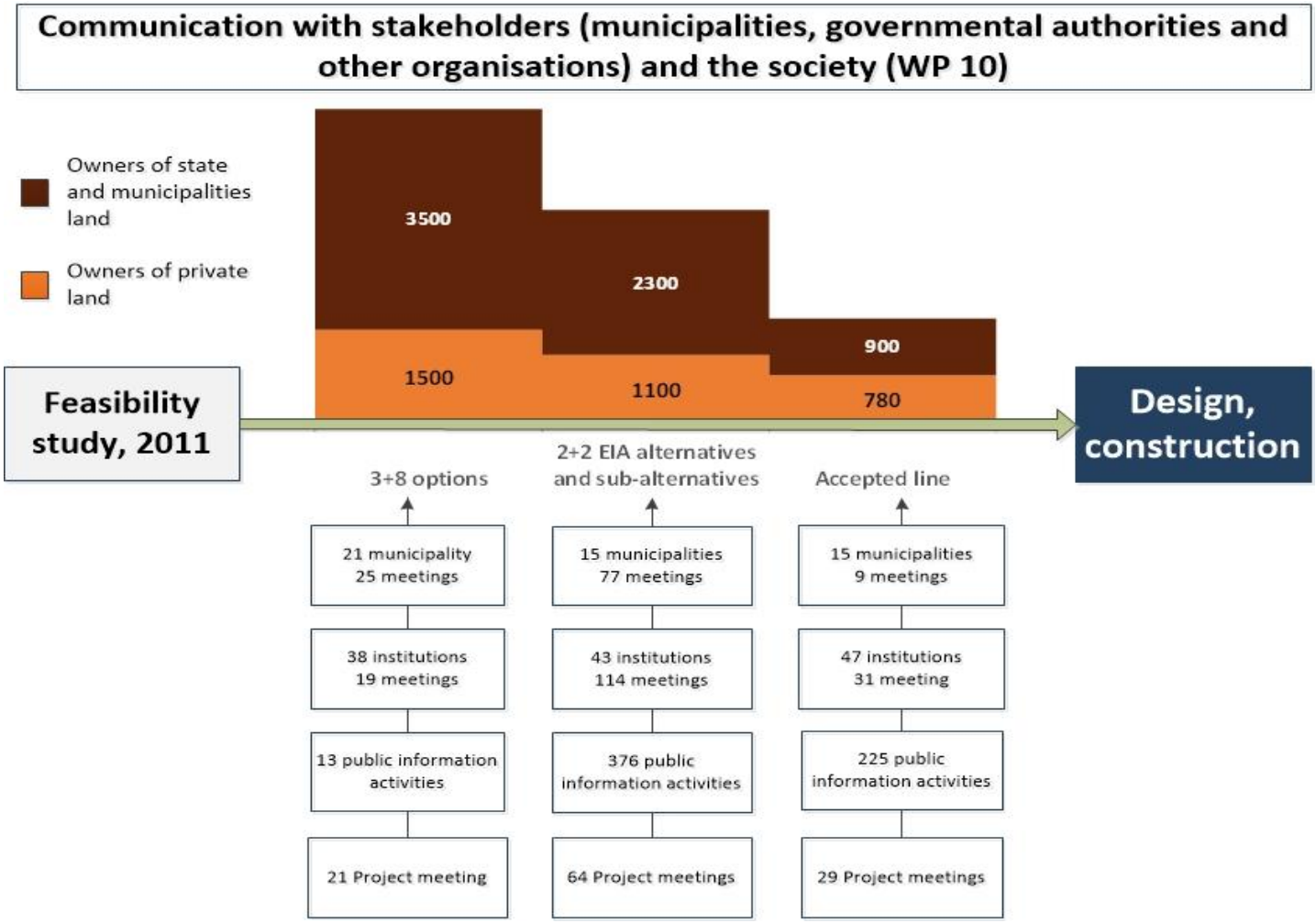


Figure 3 ***Individually involved persons in the communication process of the Detailed technical study***



1. STUDY OF THE ROUTE ALIGNMENT OPTIONS FOR THE RAILWAY TIE-IN IN RIGA

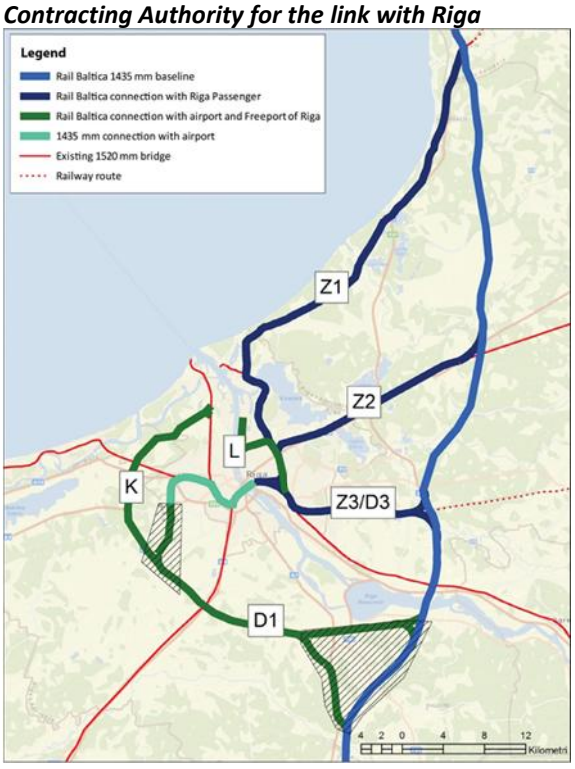
The Detailed technical study continues the research on the Rail Baltica route alignment option defined by the Feasibility study elaborating to a greater detail and justifying and clarifying the exact alignment.

The Feasibility study was carried out in 2010 and 2011 by AECOM Ltd. commissioned by the three Baltic States – Estonia, Latvia, and Lithuania. The Feasibility study defined that the most suitable line for a tie-in into Riga is the former railway line Riga – Ērgļi (see Figure 4).

Besides the option selected within the Feasibility study for the link with Riga, the Ministry of Transport commissioned other optional links with Riga city centre, Riga International Airport, and the areas of Freeport of Riga on the left and right bank of the Daugava to also be reviewed with respect to the Terms of Reference of the Detailed technical study, and to draft recommendations on the options, considering the engineering, environmental, economic and legal aspects.

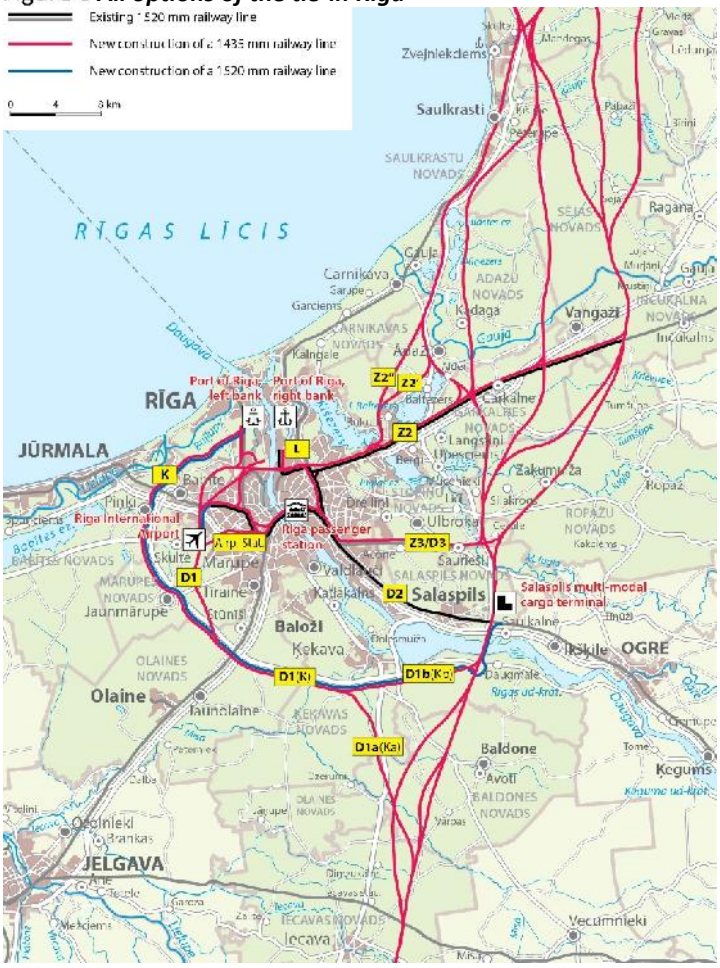
Figure 4 ***Alignment of the option defined in the Feasibility study for the link with Riga***

Figure 5 ***Alignment of the options defined by the Contracting Authority for the link with Riga***



The options were identified by connecting the main railway line with Riga Central Railway Station, Riga International Airport, the areas of Freeport of Riga on the left and right bank of the Daugava, assessing the engineering options, the possibility to connect to the existing railway system and with municipal projects, such as Riga Northern Transport Corridor by the city of Riga.

Figure 6 ***All options of the tie-in Riga***



Initially, the options were drawn on a map of a scale of 1: 50 000. The options were elaborated, considering that the technical parameters of the railway line shall meet the TSI requirements of the railway category P2/F1, and for the future development of the railway – in the sections where it is feasible from the point of engineering and economy – in accordance with the category P1.

All options of the tie-in Riga formed a combination of **38 options and sub-options in total**. Initially, the options were assessed, considering the engineering, environmental, economic, and legal aspects.

The selected eight Riga connection options and six sub-options were subject to a multi-criteria analysis with the exclusion approach[1] (findings of the multi-criteria analysis are available in Annex 9 of the Revised 1st interim report).

The options had to represent the most efficient alignment of the Rail Baltica main line and its connection with Riga city centre, Riga International Airport, and Freeport of Riga in terms of costs, functionality, the impact on the environment and society, the impact on the transport infrastructure and long-term development interests.

Figure 7 ***Riga connection options approved for the multi-criteria analysis[2]***

Option No.1:
Z3D3 1435 + airport 1520

Option No. 1a:
Z3D3 1435 + airport 1520 + port L 1435

Option No.2:
Z3D3 1435 + airport 1520 + port K 1520

Option No. 2a:
Z3D3 1435 + airport 1520 + port K 1520 + port L 1435

[1] Neumann, R. et al, (2006). Technische Universität Dresden. Transrapid und Rad-Schiene-Hochgeschwindigkeitsbahn: Ein gesamtheitlicher Systemvergleich. http://booksee.org/dl/1200679/520fd2

[2] Decision No.1-1 of 04/07/2014 by the National Management Group at the Ministry of Transport.

Option No.3:
Z2D2 1520 + airport 1520

Option No.4:
Z2D2 1520 + airport 1520 + port K 1520

Option No.5:
Z3D3 1435 + airport 1435

Option No. 5a:
Z3D3 1435 + airport 1435 + port L 1435 + port K 1435

Option No.6:
Z3D3 1435 + airport 1435, including a tunnel

Option No. 6a:
Z3D3 1435 + airport 1435, including a tunnel
+ port L 1435 + port K 1435

Option No.7:
Z3D3 1435 + airport (passing through) 1435

Option No. 7a:
Z3D3 1435 + airport (passing through) 1435
+ port L 1435 + port K 1435

Option No.8:
Northern Transport Corridor 1435 with a link to the Riga Central Station 1520

Option No. 8a:
Northern Transport Corridor 1435 with a link to the Riga Central Passenger Station 1520 + port L 1520 + port K 1435

Within MCA, the stakeholders (incl. ministries, municipalities, transport, and communication enterprises, etc.) provided relevant information to justify all of the assumptions.

The information collated for MCA was retrieved from the official data registers and meetings which were held between May and October 2014.

During the assessment of the MCA options, meetings with municipal chairpersons, deputies, planning experts, project managers, construction boards, and civil task forces, as well as the Riga and Zemgale planning regions were held (35 meetings in total).

In accordance with the MCA approach, the options were subject to an assessment of quantitative and qualitative factors, and the interests of four stakeholder groups were analysed:

- users (passengers and freight operators);
- infrastructure manager;
- environment and society;
- state and municipalities.

Within MCA, the tasks of the Detailed technical study were clarified as follows:

- It was decided to study only the options which ensure passengers with a convenient connection with Riga Central Railway Station and Riga International Airport on the newly built 1 435 mm gauge line. The section between Riga Central Railway Station and Riga International Airport was already highlighted in the Feasibility study as a connection between two infrastructure objects of national significance, which is an integral part of a principal international transport corridor. The necessity to include these objects on the Rail Baltica route was stipulated by the EU Law, such as Regulation (EU) No 1316/2013 of the European Parliament and of the Council establishing the Connecting Europe Facility (CEF), amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010; Regulation (EU) No 1315/2013 of the European Parliament and of the Council of Union guidelines for the development of the Trans-European Transport Network and repealing Decision No 661/2010/EU. Connecting Riga International Airport with a high-speed rail track complies with the development strategy of Riga International Airport and the city of Riga, and the requirements of the Commission's White Paper on Transport. Moreover, the link between Riga city centre and the airport, which is a part of the railway infrastructure line Rail Baltica, is a significant contribution to the mobility and the agglomeration of the city of Riga providing a regular and fast connection of the city centre with Riga International Airport and other areas on the left bank of the Daugava.
- It was decided to define the 1 435 mm gauge railway connection with the port areas as a long-term development project, and, within the Rail Baltica project, to develop an intermodal cargo terminal of the Rail Baltica railway in the Salaspils municipality, Latvia.

The clarified tasks of the Study were in line with the options **R5** (Figure 8), **R5'** (Figure 9), and **R7** (Figure 10). The option R8 was also partly in line with these, however, it was excluded after an in-depth study, since it had a difficult integration with the Riga Northern Transport Corridor, and it lacked a direct 1 435 mm line connection with Riga Central Railway Station.

Figure 8 ***Option R5***

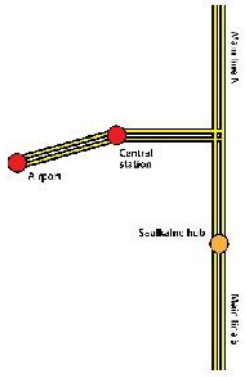


Figure 9 ***Option R5'***

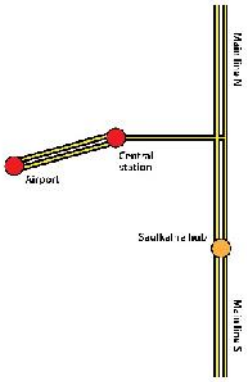


Figure 10 ***Option R7***

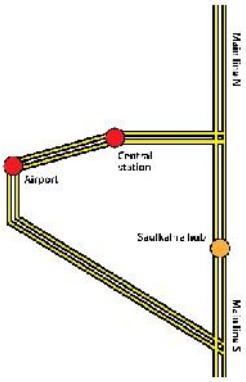
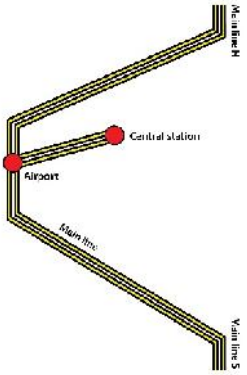


Figure 11 ***Option R8***



In accordance with the MCA approach, the key advantages of the options R5, R5', and R7 by stakeholder categories are summarized in the table below (see Table 1).

Table 1 ***Key advantages of the Riga connection options selected by the MCA***

Stakeholder group	Interests of the stakeholder group
Users (passengers, freight operators)	- Balance between the interests of all user groups is ensured – transit passengers, passengers travelling to Riga city centre or the airport, passengers commuting only between the centre and the airport;

Stakeholder group	Interests of the stakeholder group
	- An opportunity to turn Riga Central Railway Station into a public transport hub; - The optimum speed of the transit cargo flow, and a further link with Freeport of Riga; - An opportunity to turn Riga International Airport into an air cargo distribution centre; - Maximum balance between the interests of passengers and freight shippers, incl. an opportunity to develop industrial areas and logistics centres at sites which are significant infrastructure hubs.
Infrastructure manager	- The optimum scope of investment with a flexible approach during the development stages of the Project implementation, for instance, to construct the section Riga Central Railway Station – Riga International Airport (Option R5' of MCA) as stage one, which in future can be extended with the section Riga International Airport – main line (Option 7 of MCA). - The options demonstrate optimum operation costs. Operation and maintenance is reasonable since a difficult integration with the 1 520 mm gauge railway system is not necessary.
Environment and society	- During the construction of options, the impact on protected nature areas is minimized; - The cargo flow is diverted outside of the residential areas, incl. Riga; - The smallest direct and indirect impact on inhabitants, enterprises, and the urban environment of Riga in general, since the existing 1 520 mm gauge railway right of way is used for the most part of the route and is merged into a single corridor with the envisaged reconstructed road corridor of the Riga by-bass A5 in the Mārupe, Olaine, and Ķekava municipalities.
State and municipalities	- The options ensure the implementation of the long-term strategic interests of Latvia and the principles of the EU transport policy guidelines, and thus the Rail Baltica Latvian section is efficiently included in the North Sea – Baltic Sea transport corridor; - The optimum area of properties is expropriated, and, where possible, state lands are used, since the options make use of existing transport and communications infrastructure corridors.

In December 2014, the Ministry of Transport approved Option R7 for further study and an environmental impact assessment (Figure 12).

Figure 12 ***Connection with Riga – the option selected based on MCA (R7)***

2. DETAILED STUDY OF TECHNICAL AND SPATIAL PRECONDITIONS AND ELABORATION OF RECOMMENDATIONS ON THE RAILWAY ROUTE ALIGNMENT

Figure 13 ***Option selected in the Feasibility study***

The total length of the railway line option defined by the Feasibility study amounted to 728 km in the Baltic States, incl. 235 km in Latvia (Figure 13).

The route defined by the Feasibility study crossed the military training area „Ādaži“ of the National Armed Forces (NAF) and the later extended area of the NATURA 2000 – the protected landscape area „Ādaži“, including the nature reserve „Dzelves–Kroņa purvs“. It crossed the nature reserve „Garkalnes meži“ and the specially protected nature area in Latvia - „Buļļezers“, which is not a part of NATURA 2000.

Figure 14 ***Initially elaborated options of the main line***

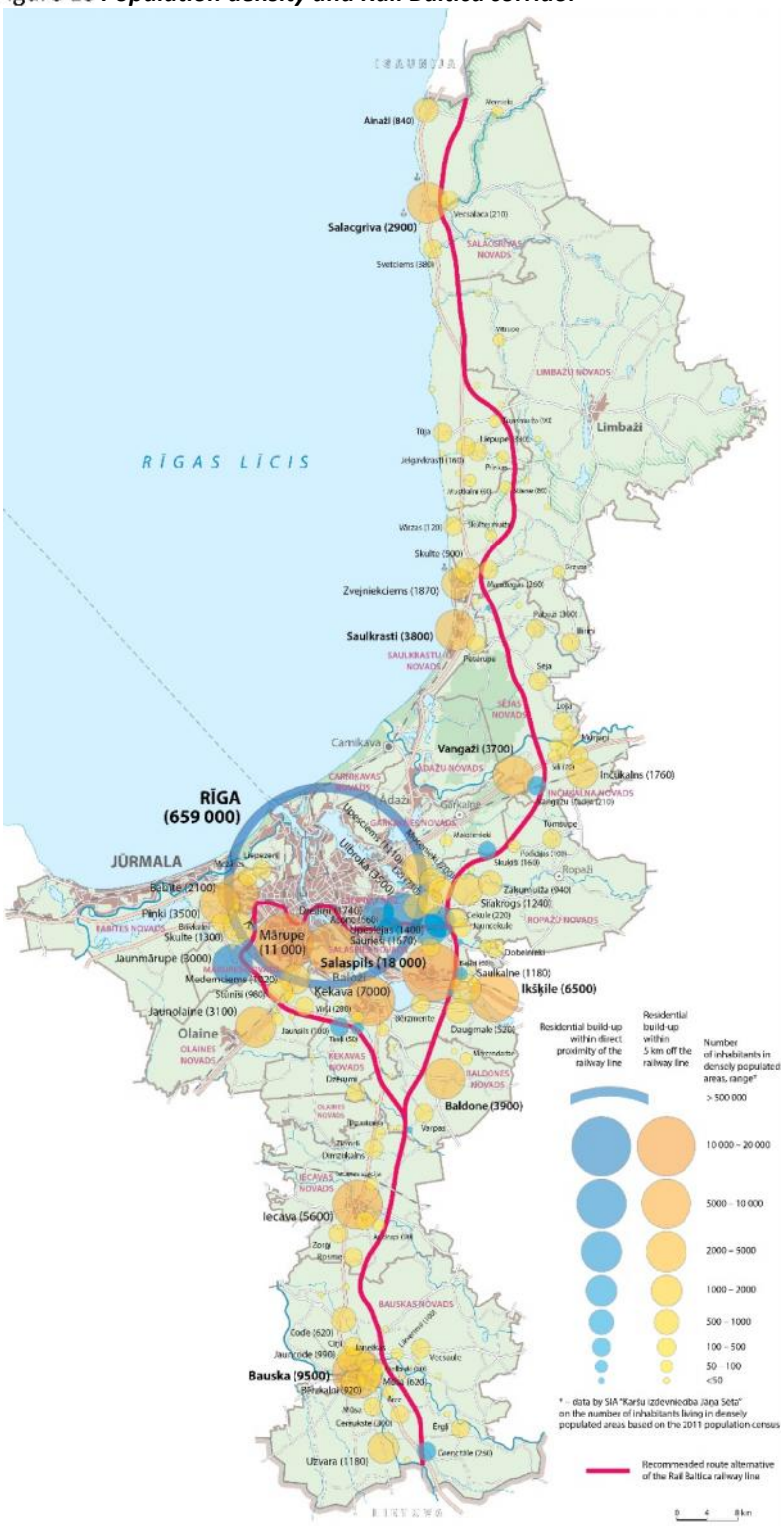
Therefore, at the beginning of the Detailed technical study, the highest number of options (eight)

were elaborated for this section in order to avoid the military training area of NAF and the NATURA 2000 (see Figure 14).

The options on the west side from the polygon were described as too complicated, since they affected the densely built up areas along the road Via Baltica (E67/A1) and along the coast of the Riga Gulf in the Saulkrasti, Carnikava, and Ādaži municipalities, crossed a NATURA 2000 area – the nature park "Piejūra" and other protected nature areas, and the strict regimen protective belt of the site for the extraction of drinking water for Riga (Baltezers water intake station). At this stage, the options crossing the Sēja, Inčukalns, and Ropaži municipalities were subject to further study.

Initially, the key restricting aspects were selected – residential areas, specially protected nature areas, especially NATURA 2000 areas, risk objects (nuclear waste disposal site, polluted areas, etc.), heritage monuments, complicated crossings of the water bodies, existing roads and railway infrastructure, communication pipes and objects (gas, power, water supply etc.), mineral deposit extraction sites, ports, and industrial areas.

Figure 15 ***Population density and Rail Baltica corridor***



It was taken into consideration whether the options cross large-scale governmental or municipal investment projects. It was also taken into consideration whether the Rail Baltica route was envisaged in the municipal spatial plans.

Initially, the route options were mapped on a scale of 1: 50 000. Overview maps were drafted depicting the population density with the smallest unit being a village of at least 50 inhabitants, specially protected nature areas, heritage objects, risk objects, etc. (map of “Karšu izdevniecība Jāņa Sēta” Ltd.) (example Figure 15).

At the stage of MCA, assessing the options in terms of the interests of the four stakeholder groups, the possible options were depicted at a greater level of detail – on maps with a scale of 1: 10 000, and merged with the cadastre information. This allowed for an analysis of the options, considering the property ownership, land usage types, the impact on the inhabited, agricultural and forestry lands, business activities, the impact on the local transport infrastructure, the accessibility of service objects, and access to land plots.

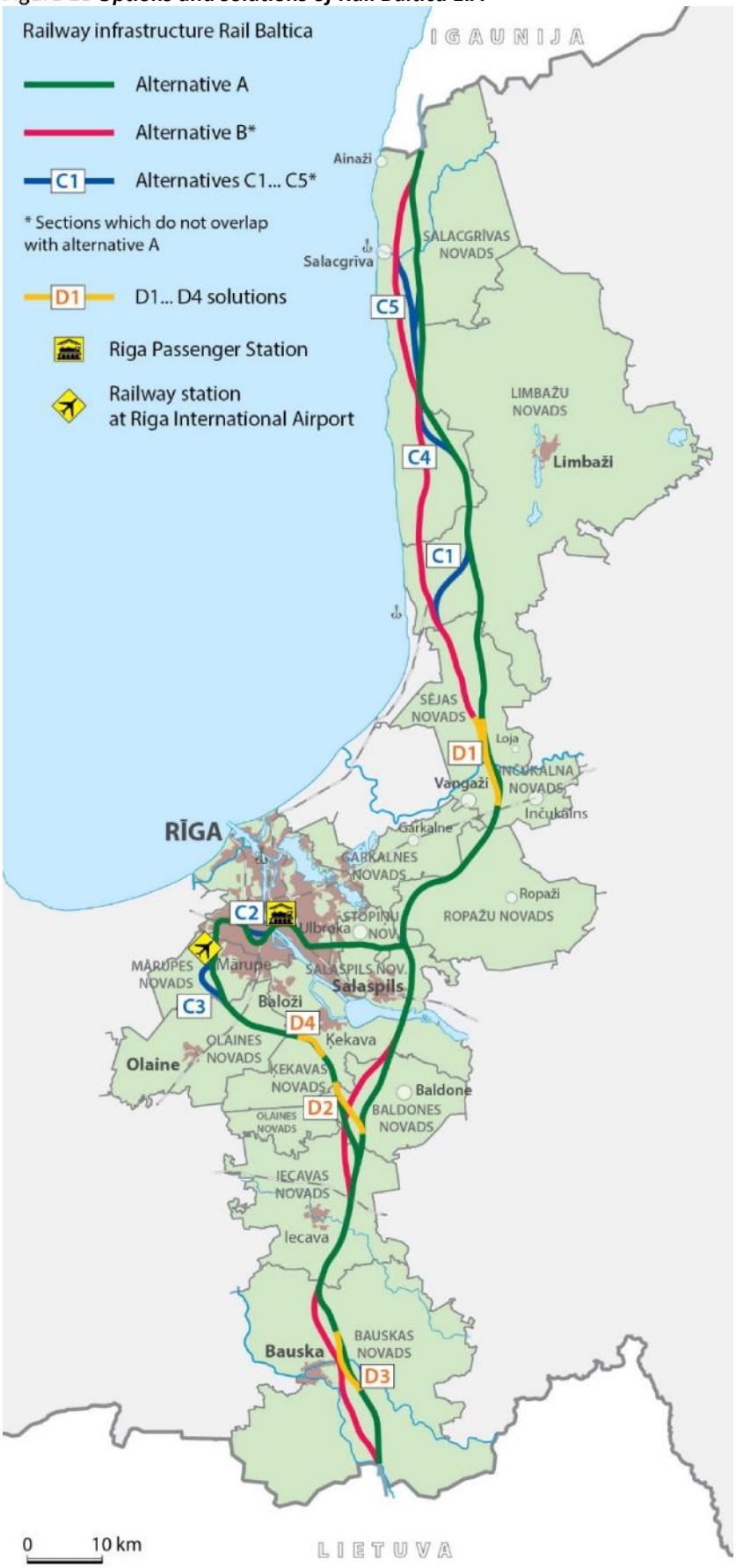
Also, the option defined by the Feasibility study was among the options evaluated by MCA. First, it was rectified in accordance with the railway movement technical parameters, and then it was depicted on a scale of 1: 10 000.

In accordance with the locations set in the Feasibility study, the agreement process between Latvia, Estonia, and Lithuania regarding the border crossing points was already initiated in the early phase of the multi-criteria analysis. The Estonian national study initially elaborated four route options and four respective border crossing points. The recommended point by the Estonian experts was the most suitable in ensuring the protection of specially protected nature areas in Estonia. The Latvian experts found it suitable, since it did not affect residential areas or homes in the Latvian side. The ministries in charge of Rail Baltica in the Republic of Latvia and the Republic of Estonia agreed on the coordinates of the border crossing point, and thus confirmed that the States will respect the crossing point further on in the project and will not change it unilaterally, thus ensuring the compatibility of the Rail Baltica sections between Latvia and Estonia.

According to the Feasibility study, the border crossing point with Lithuania is located on the river Mūsa, not far from the border crossing point of the village Grenctāle in the Bauska municipality, Latvia, and Dagiai in the Pasvalys district, Lithuania. In the Latvian section, the border is crossed by the alternative A (recommended in accordance with EIA) and in the Lithuanian section – by the alternative No.1. Since the alternative No.1 (LT) crosses the northern Lithuanian karst region, the Lithuanian Detailed technical study considers another alternative with a different border crossing point (near to Kamarde). In order to adhere to the crossing point defined by the Feasibility study, approved by the three Baltic states, a geoengineering study was carried out in the border area in August 2015. It determined that there are no layers comprising gypsum and no risk of karst process development in the area of the route defined by the Feasibility study. The Lithuanian EIA recommends the alternative No.1 which is compatible with the alternative A on the Latvian side. However, it shall be noted that the authorities involved in the Project implementation in all three countries are continuing their work of coordinating the border crossing issues.

MCA considered 33 combinations of options in the northern part of Latvia, 15 combinations of options in the southern part of Latvia, and 11 combinations of options for the connection with Riga (the central part of Latvia).

Figure 16 ***Options and solutions of Rail Baltica EIA***



For further study and EIA the following options were selected and presented in the initial EIA public discussion in February 2015:

- **The technically rectified route defined by the Feasibility study**, excluding the section crossing NATURA 2000 PNA “Ādaži” (the **alternative B** in EIA)**;**
- The option elaborated within the Detailed technical study and selected per the result of MCA – the **alternative A** with its sub-alternatives near Skulte in the Limbaži municipality (C1) and in Āgenskalns, Riga (C2).

Following the initial EIA public discussion in February 2015 and the recommendations of environmental experts, additional alternatives were elaborated for some sections and brought to the initial EIA public discussion in September 2015 – **alternatives C3, C4, C5** (Figure 16). For some route sections the previously considered alternatives A and B were clarified (Figure 16 – D sections), and based on the environment impact assessment – the C2 alternative was excluded.

In the breakdown of the fifteen municipalities, a technical study and an environmental impact assessment was carried out for these Rail Baltica railway alignment alternatives:

- In the **Salacgrīva municipality**, the alternative B was located closer to the town Salacgrīva in order to develop a perspective regional station and a connection with the small port in Salacgrīva, and to make a single corridor with a bypass around Salacgrīva in case such a road is developed in the future. The alternative A was located away from the town Salacgrīva and crossed forest lands, and thus had less impact on households and properties. Both alternatives crossed a linear shape in the nature park "Valley of the Salaca River", and the alternative A also crossed the NATURA 2000 nature reserve "Valley of the Vitrupe River" which also has a linear shape, and backing off from them would be considered as backing off from the option selected by the Feasibility study with new impact. The alternative B ran along the road Via Baltica, incl. through the residential settlement Svētciems, where the agriculture lands are fragmented and rather densely built-up. Thus, in cooperation with the Salacgrīva municipality and local inhabitants, two additional alternatives C4 and C5 were elaborated. The alternative C4 reduced the impact on a group of rural households, and C5 was the third alternative to cross the NATURA 2000 nature reserve "Valley of the Vitrupe River" at its narrowest site with the technological solutions to prevent any impact on the EU priority habitats.
- In the **Limbaži municipality**, the alternative A crossed forests and less populated areas in comparison to the alternative B which ran along the road Via Baltica and its rather densely populated surroundings. The alternative C1 made use of the railway embankment of the previous railway line Skulte-Ipiķi-state border, which, in accordance with the Cabinet of Ministers Decree No.510 "On the transfer of the state-owned railway line section Skulte-Ipiķi-state border to municipalities" of 3 November 1999, is owned by the municipality. The alternative C1 could also be connected to the 1 520 mm gauge railway system and benefit from the road Via Baltica, thus developing the logistics area near the Skulte timber-port and a regional passenger station in the future.
- In the **Sēja municipality**, the alternative A crossed large territories of forests before entering managed and populated agricultural lands and households. The alternative B crossed agricultural lands for a smaller section of a few kilometres in the north of the Sēja municipality and then diverted to the edge of agricultural lands and the eastern side of the NATURA 2000 PLA "Ādaži" and the National Armed Forces military training area "Ādaži", thus affecting less rural farms and avoiding NATURA 2000. In the southern part of the Sēja municipality, both alternatives come together in one alignment and cross the River Gauja and its valley in the narrowest site. During EIA, better alignment was elaborated for the alternative A (section D1) in order to protect cultural monuments and rural farms and to avoid micro-reserves.
- In the **Inčukalns municipality**, the alternative A ran through forest lands. At the crossing with the 1 520 mm gauge railway in Vangaži, a maintenance facility for cargo trains of 1 435 mm gauge railway has been elaborated. In the Inčukalns municipality, the Rail Baltica route has been elaborated taking into consideration the location of the underground gas storage facility, its monitoring boreholes, acid tar ponds and NATURA 2000 areas – the Gauja National Park and the nature reserve "Garkalnes meži".
- In the **Ropaži municipality**, the alternative A ran through forest lands, crossed the river Lielā Jugla and its floodplain, passed between the villages Mucenieki and Silakrogs, and diverted back to the west to connect to the railway line defined by the Feasibility study.
- In the **Stopiņi municipality**, the alternative A diverted back to the Riga tie-in defined by the Feasibility study, and near the village Cekule it split into a passenger line to Riga Central Railway Station, running on the former railway line Riga-Ērgļi and the main railway line which led along the Riga by-pass road A4. In Acone, the Stopiņi municipality, a depot for the maintenance of Rail Baltica passenger trains was planned in front of the "Riga thermal power plant-2" industrial site.

- In **Riga**, the alternative A made use of the railway line Riga-Ērgļi up to the station Preču 2, where it crossed the 1 520 mm gauge tracks within the railway right of way and continued further to Riga Central Railway Station and then down to the river Daugava. The Rail Baltica railway crossed the river on a separate bridge, and near Torņakalns it formed two alternatives – the alternative A used the railway right of way of the line Riga-Tukums 2 by building a shallow tunnel, and the alternative C2 crossed Āgenskalns in a straight line through an underground tunnel and came above ground near Ventspils Street, which is the closest possible place with enough space to fit with the existing tracks of the railway Riga-Tukums 2. Near the crossing of Kārļa Ulmaņa street, the alternative A continued in the direction of Riga International Airport, entering its territory from the north.
- In the **Mārupe municipality**, the alternative A ran in parallel to the airport runways. The airport was intended for the Rail Baltica passenger station and a connection to the airport passenger terminal. After the airport, the alternative A crossed the village Vētras in a straight line running in the southern direction and merging with the Riga by-pass road A5. After the airport, the alternative C3 merged with the Riga by-pass road A5 (near Jaunmārupe) at the nearest possibility to continue on in a single corridor.
- The **Olaine municipality** was crossed by the alternative A in a single transport corridor with the Riga by-pass road A5.
- In **the Salaspils and Ķekava municipalities**, the alternative A matched with the fixed and technically revised crossing location defined by the Feasibility study, i.e. the crossing of the reservoir of the Riga Hydroelectric Power Plant (Daugava), continuing the imaginary line from the Riga by-pass road A4. In the Salaspils municipality, areas for the inter-modal cargo terminal of Rail Baltica were reserved. The Ķekava municipality was affected by the Riga tie-in route, which runs in a single corridor with the road E67 (the Ķekava by-pass).
- In the **Baldone municipality**, the alternative A crossed the municipality in a straighter line than the main railway line or the alternative B (set in the Feasibility study). The alternative A was further away from the nuclear waste disposal site "Radons" than the alternative B. In the Baldone municipality, the Riga link connects to the main railway line. During EIA, a solution for a shorter connection to the Riga link – section D2 – was found, and it had a lesser impact on the summer house villages Misa and Sarma than the previous connection.
- In the **Iecava municipality**, the alternative A crossed forests for a larger section than the alternative B. Thus the alternative B, which crossed the municipality area in a single corridor with Via Baltica, impacted agricultural activities at a greater level and made the properties more fragmented.
- In the **Bauska municipality**, the alternative A diverted around agricultural lands of national significance and came back to the LV/LT border crossing point established within the Feasibility study. However, the alternative B ran in parallel to Via Baltica and impacted the existing farms near the road and the village infrastructure.

The EIA alternatives met the future ideas proposed by the municipalities and inhabitants aiming at the development of the regional railway traffic and the logistic and industrial areas at the sites where Rail Baltica meets the existing 1 520 mm gauge railway lines and international roads, and in the lands owned by the state or municipalities.

During the Study, it was decided to place the communications and transport corridors as close to each other as possible to reduce the impact on the environment and properties (Figure 17).

A single infrastructure corridor is envisaged for the Rail Baltica railway line with the third Estonia-Latvia power supply network interconnection from Sindi (Kilingi-Nõmme) in Estonia to the Salaspils substation (or Riga TPS-2) in Latvia, with the initiator of the construction being the owner of the power transmission network in Latvia – JSC "Latvijas Elektriskie tīkli".

The alternative 1b of the third Estonia-Latvia power supply network interconnection starts in the Skulte parish (the Limbaži municipality) near the village Stiene, where Rail Baltica crosses the existing 110 kV power transmission line and continues up to Riga TPS-2, running along the border of the Salaspils and Stopiņi municipalities (the railway line Riga-Ērgļi).

A single infrastructure corridor with the existing railway lines is also planned for the Rail Baltica connection to Riga. For the Riga connection, the land of the 1 520 mm gauge railway is used, beginning from the main line in the Stopiņi municipality, through Riga Central Railway Station, and up to Imanta.

In several sections, where the technical railway parameters allow this, Rail Baltica is envisaged to run in single corridors with the existing state main roads and, in some sections, with the planned state main roads. The technical solutions are approved with these road projects:

- Construction of the by-pass (E67) (Ķekava by-pass) within the road A7 Riga – Bauska – Lithuanian border (Grenctāle), in the section from 10.5 km to 24.0 km,
- Reconstruction of the road A5 Riga by-pass (Salaspils - Babīte), section km 11,6 (A7) – km 34,6 (A9);
- Construction of the road E22 (eastern link to Riga), section “Kranciema karjers – Slāvu aplis”;
- Construction of the state main road E67, section A4 (Saulkalne) – Bauska (Ārce).

Figure 17 ***Single infrastructure corridors***

3. DETERMINATION OF THE TECHNICAL PARAMETERS OF THE RAILWAY LINE

During the Study, considering the recommendation of the EC guidelines for the TEN-T network and the technical parameters of the railway determined during the Feasibility study, an agreement on the draft operation and the key technical parameters of the Rail Baltica railway line was made in cooperation with the Rail Baltica project experts from Estonia and Lithuania.

Similarly as in Estonia and Lithuania, the key parameters of the Rail Baltica railway line are as follows:

- maximum speed of passenger trains – 240 km/h,
- maximum speed of cargo trains – 120 km/h,
- length of international passenger trains – 200 m, with the possibility to extend their length up to 400 m in the future,
- length of cargo trains – 740 m, with the possibility to extend their length up to 1 050 m in the future,
- 2x25 kV electrification system,
- European Rail Traffic Management System – ERTMS Level 2, with an opportunity to apply a higher level,
- Global System for Mobile Communications – Railway (GSM-R), with an opportunity to apply a more recent system.

No significant changes of the technical parameters of the railway line identified by the Feasibility study were necessary, and during the Study, the parameters were clarified and updated with the cooperation of experts from all three Baltic States. All parameters of the Rail Baltica railway line are approved by all three Baltic States and set in the Common principles and its annexes.

The cargo and passenger flow forecast of the Feasibility study was updated considering the impact of the extra traffic flows generated by regional/commuter passenger traffic and the passenger and cargo traffic flow to Riga International Airport and Freeport of Riga.

In terms of cargo, the priorities defined by the Riga municipality shall be taken into consideration, i.e. to reduce the cargo flow through the Historic Centre of Riga. Currently, cargo is transported through Riga city centre on the 1 520 mm gauge tracks. The State Joint Stock Company "Latvijas Dzelzceļš" (Latvian Railway) is developing connections with the port areas on the left and right bank of the Daugava. In 2015, Latvian Railway finished the project "Construction of the station Bolderāja 2 with an access road to Krievu Sala terminals", which included the development of the railway infrastructure on the left bank of the Daugava and the construction of a railway connection with the port area in Krievu Sala by constructing a rail track, the railway station Bolderāja 2 with nine rail tracks, bridges, and railway cross-overs.[3] Enterprises located in the Freeport of Riga territory informed that they are using the existing 1 520 mm gauge railway infrastructure and see no need for a 1 435 mm gauge railway connection to the port territories on either bank of the river.

Considering these conclusions, it was established within the Rail Baltica study that it is more reasonable to develop an inland cargo terminal and deliver the cargoes to the port on the existing 1 520 mm gauge railway system and roads.

[3] Construction of station Bolderāja 2 with access road to Krievu Sala' terminals, available: http://www.ldz.lv/lv/content/stacijas-bolder%C4%81ja-2-ar-savienojo%C5%A1o-ce%C4%BCu-uz-krievu-salas-termin%C4%81liem-b%C5%ABvniec%C4%ABba-0

In cooperation with Latvian Railway, it was estimated that the new 1 520 mm gauge rail connection on the left bank of the Daugava between the Riga-Krustpils and Riga-Jelgava railway lines, including the 1 520 mm bridge over the reservoir of the Riga Hydroelectric Power Plant (Daugava), might be developed in the long-term. Thus a connection of the 1 520 mm and the 1 435 mm gauge railways and a connection with the inter-modal cargo terminal in Salaspils will be ensured. The technical solutions allow for a future possibility to construct a new 1 520 mm gauge line in the Baldone, Ķekava, Olaine and Mārupe municipalities.

Within the Study, another type of cargo that might be shipped to the airport on the 1 435 mm gauge railway was identified, i.e. air cargo. Considering the small and specific nature of the existing airport cargoes, currently the only commodity that could be shipped to the airport by rail might be fuel. However, according to the strategic plan of Riga International Airport, freight cargo is expected to have a significant growth, which would allow to utilize the airport cargo connection. Technical solutions have been designed for the cargo line from south to Riga International Airport.

In terms of passengers, currently there is no efficient public transport connection between Riga International Airport and Riga city centre. Employees working at the airport companies and airport passengers will comprise the largest proportion of the total number of potential passengers of the Rail Baltica shuttle line. The type of the railway connection (1 520 mm or 1 435 mm gauge) is not essential to the local passengers if equal level of service quality is ensured on both railways. However, the 1 435 mm connection is more significant because the international passengers would benefit from a more comfortable connection with the city centre (with no interchanges). As indicated in Task 1 of the Study, both Riga Central Railway Station and Riga International Airport are strategically important infrastructure objects for Latvia, and the necessity of a connection between them was already emphasized in the Feasibility study, as well as the transport planning documents at the EU and national level. The forecast of the increase of passenger flows is based on the development forecasts by Riga International Airport, which foresee a moderate and stable growth in the middle and longer-term by 2036, reaching up to 6.8 million passengers in 2036.[4]

Thus, according to the draft operation plan of the Rail Baltica railway line, the passenger line in the Latvian section is envisaged on the route: Estonian border – Rail Baltica station in Riga Central Railway Station – Rail Baltica station in Riga International Airport – Lithuanian border.

Rail Baltica stations ensure integration with the public transport network: in Riga Central Railway Station the Rail Baltica railway is connected to the 1 520 mm gauge passenger railway network, the international, intercity, regional, and local bus network, the Riga city inner and Riga agglomeration public transport systems, and in Riga International Airport the Rail Baltica railway is connected to the aviation passenger transport network.

The key principles for the determination of the train interchange points and inter track connection points were decided in accordance with the Common principles (set by all three Baltic States), which allow for an efficient operation of the railway line.

[4] Information by the state joint stock company " Riga International Airport", which was prepared following a request by the GS "RB Latvija" for the purposes of the Rail Baltica detailed study, 2015

Having reviewed the experience of the European countries and in accordance with the agreement by all three Baltic States, the train interchange points shall be located at a distance of 50 km from each other. According to the existing situation on site, the train interchange points in Latvia will be located near Salacgrīva, Skulte, Vangaži, the inter-modal cargo terminal in the Salaspils municipality, Baldone, and Bauska (Figure 18).

In order to reduce the impact of maintenance, repairs, and other works on the throughput of the Rail Baltica railway line, inter track connections points are planned every 25 km in the Baltic States; this will allow to close some single track sections for traffic and diverting the trains on the other track for reverse movement. Such inter track connection points are planned at sites which, without significant reconstruction (only constructing new tracks and passenger/cargo service infrastructure (platforms, access, etc.)), might be used in the future for the passenger/cargo service for the regional, intercity, and local railway traffic. The inter track connection points are envisaged in the Salacgrīva municipality near Tūjasmuiža/Melbārži, and near Iecava.

In addition to that, a technical railway station is planned near the National Armed Forces military training area "Ādaži" to transport military cargo to/from the shooting ground.

Figure 18 ***Location of the Rail Baltica stations for train modelling***

Three railway maintenance stations are also planned: one of them is to be located near the Acone train maintenance facility in the Stopiņi municipality to serve the passenger trains, another one for cargo trains will be located near Salaspils, and the last one for the railway infrastructure will be located near Vangaži in the Incukalns municipality.

During the study, the **railway traffic was modelled**. The aim was to determine the throughput capacity of the combined passenger/cargo railway traffic on Rail Baltica according to the location of the envisaged stations, to ensure the relevant safety intervals between trains, and to determine the relevant traction parameters for the power supply of the Rail Baltica railway. The railway modelling was based on the estimated international, regional, and local passenger and cargo train traffic.

According to the performed traffic modelling, it was established that the estimated location of the stations ensures a smooth distribution of traffic over 24h, and restrictions are not necessary to plan the train traffic (e.g., cargo traffic only at night when the passenger trains are not running). Also, according to the railway traffic modelling data, the maximum necessary traction power was calculated, and this was further used to determine the key power supply parameters of the Rail Baltica railway.

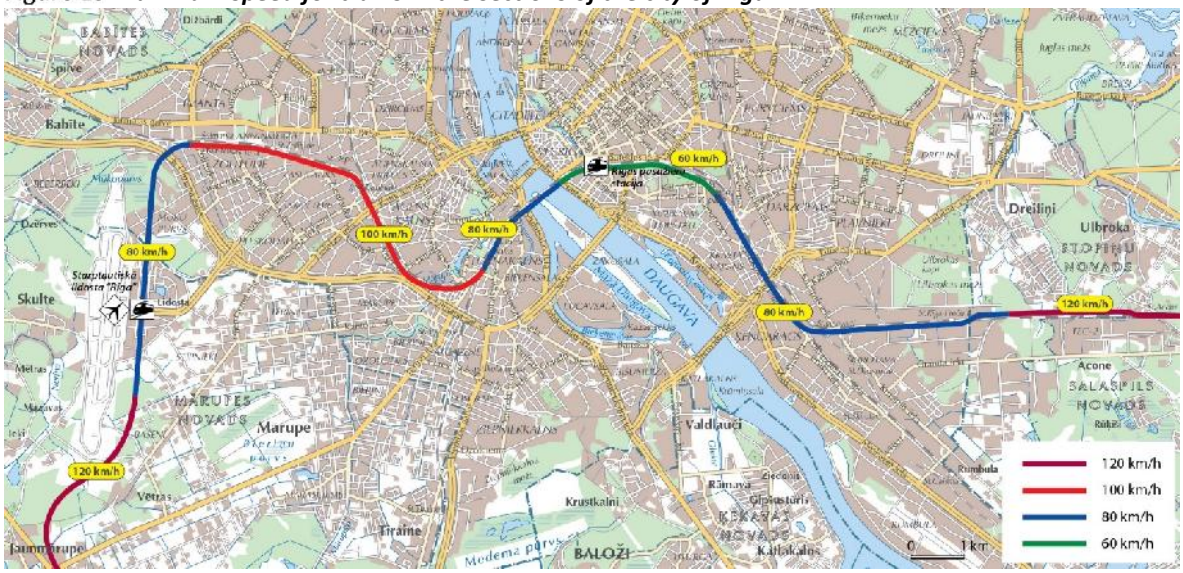
Table 2 ***Envisaged intensity of the Rail Baltica railway traffic***

Type of train	Traffic intensity – number of wagons during the day		
	Day	Evening	Night
Main railway line from the Estonian to Lithuanian border			
High-speed train for international passenger transport	132	44	22
Trains for regional passenger transport	120	40	20
Cargo	935	312	623
Link with Riga – section from Stopini municipality (Upeslejas) to international airport "Riga"			
High-speed train for international passenger transport	132	44	22
Trains for regional passenger transport	120	40	20
Link with Riga – section from *international airport "Riga" to Baldone municipality*			
High-speed train for international passenger transport	132	44	22
Trains for regional passenger transport	120	40	20
Cargo	104	35	69

Table 3 ***Envisaged maximum driving speed of trains on the Rail Baltica route sections***

Route section	Train speed, km/h (max)		
	High-speed train for international passenger transport	Trains for regional passenger transport	Cargo trains
Main railway line from the Estonian to Lithuanian border	240	160	120
Tie-in Riga and in the Stopini municipality (Upeslejas) – Acone	120	120	-
Acone – Preču 2	100	100	-
Preču 2 – Šķirotava/Krustpils Street	100	100	-
Krustpils Street – Vagonparks	80	80	-
Vagonparks– Riga Central Railway Station	60	60	-
Riga Central Railway Station – Torņakalns	80	80	-
Torņakalns - Imanta	100	100	-
Imanta - Airport	80	80	-
Airport - Baldone	120	120	60

Figure 19 ***Maximum speed for trains in the sections of the city of Riga***



The traffic intensity model for the accepted route was updated considering the findings of a separate study by the Ministry of Transport on the optional (organisational) models of the railway line traffic management and control system, and proposals for the action plan for the establishment and operation of the railway line, which was carried out by the partnership “Maivro un Railistics GmbH” Ltd. (No. SM 2015/17 TEN-T “Study of the Rail Baltica railway line traffic management system and elaboration of an action plan”).

4. ENVIRONMENTAL IMPACT ASSESSMENT

The environmental impact assessment (EIA) was carried out in accordance with the Law on Environmental Impact Assessment and Cabinet of Ministers Regulations No.18 “Procedures for environmental impact assessment by intended activity and for acceptance of intended activity” of 13 January 2015.

EIA of the intended activity has been commenced on 22 October 2014 by a letter from the initiator – the Ministry of Transport – to the Environmental State Bureau (Bureau), and based on this the Bureau made Decision No.487 of 20 October 2014 to apply the environmental impact assessment procedure in accordance with Article 4 of the Law on Environmental impact Assessment and Article 9 of Annex 1 of Law “Objects requiring impact assessment”.

The Bureau made Decision No.3-02/122 of 26 January 2014 “On the transboundary impact of an activity, which is subject to environmental impact assessment procedure”, where the intended activity:

- is included also in Article 7 sub-clause a) of Annex 1 of the Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) – “lines for long-distance railway traffic”, and within Article 7 of Annex 1 of the ESPO Convention on Environmental Impact Assessment in a Transboundary Context of 25 February 1991 – “intercity railway line”,
- in terms of mutual and accumulated impacts, may cause significant transboundary impact in the republic of Lithuania, Republic of Estonia, and Republic of Poland.

The initial public discussion of the intended activity was held from 13 February till 15 March 2015. It was held in all municipalities crossed by Rail Baltica, i.e. the Salacgrīva municipality, Limbaži municipality, Sēja municipality, Inčukalns municipality, Ropaži municipality, Garkalne municipality, Stopiņi municipality, Salaspils municipality, Ķekava municipality, Iecava municipality, Bauska municipality, Baldone municipality, Mārupe municipality, Olaine municipality, and Riga municipality. The discussions gathered a total of 5000 participants, and during the initial public discussions more than 600 opinions, recommendations, and written proposals and suggestions made by public, municipal, and authorities' representatives were received. When the EIA Programme was elaborated, the proposals were considered, reviewed, and included in the EIA Report by the Bureau.

The initial public discussion was announced, held, and documented in accordance with the legislative requirements, which is also approved by Decision No. 3-01/839 of 13 April 2015 by the Bureau, where the Bureau concludes that there have not been any violations or disregard of the public rights determined by the legislative requirements regarding the information or participation in the EIA discussion process. The initial public discussions regarding the additional alternatives for the Mārupe, Salacgrīva and Limbaži municipalities were held between 4 and 24 September 2015.

The EIA Report, which also covers an assessment regarding the transboundary impacts, is drafted based on laws and regulations, and international conventions ratified by Latvia in the field of environmental protection, as well as the programme for the environmental impact assessment (EIA Programme) of 11 May 2015 by the Bureau on the construction of the European gauge width public use railway infrastructure Rail Baltica.

In accordance with the EIA Programme, the EIA Report consists of two parts:

- The general part of the EIA Report describes the intended activity in principle, alternatives of the intended activity, assesses its compatibility with planning documents and legislative regulations, provides information on compensation instruments, public discussions, and assesses and forecasts the mutual and accumulated impacts due to the implementation of Rail Baltica in the Baltic States,
- The assessment part of the EIA Report describes the current situation, the intended activity, its alternative solutions and related activities, the location and its vicinity, covers the assessment of the existing environmental conditions, describes the potential impact on the environment by the intended activity, assesses limiting and restricting factors, planned measures for the prevention and reduction of the impact, provides a comparison of the alternatives, and justifies the recommended route.

The impact of the intended activity on the environment, society, residents, natural values and other aspects was assessed both during the construction and operation:

- Impact during the construction;
- Impact on the hydrological mode and drainage conditions;
- Impact of the tunnel construction solutions;
- Impact on the quality of water, fish fauna and water ecosystem of the Daugava and other water courses to be crossed;
- Possibility and significance of changes in today's geological processes;
- Impact on the territories of mining activities;
- Impact on air quality;
- Assessment of noise impact;
- Assessment of vibrations and impacts thereof;
- Changes of the electromagnetic field level and significance thereof;
- Impact and significance thereof on the biodiversity and specially protected natural territories;
- Impact and significance thereof on the surrounding landscape.

The EIA Report has been drafted by a team of experts representing various fields: the transport and engineering infrastructure, hydrology, geology, hydro-geology, seismology, ornithology, experts assessing the impact on habitats, noises, landscapes, cultural heritage, mammals, tourism, and electromagnetic radiation.

The EIA Report announces the **recommended Rail Baltica route alignment**, considering the results of the assessment of the alternatives, which covers a comprehensive comparison of the aspects of environment, nature, cultural heritage, public and municipal attitudes, and the potential of the socio-economic and future development (Figure 20).

The public discussion of the EIA Report was held from 11 November till 11 December 2015, and, during the discussion, the visitors could review the EIA Report and submit written proposals. During the public discussion, a public discussion meeting was held in each of the municipalities crossed by the Rail Baltica route. Joint meetings with JSC "Latvijas Elektriskie tīkli" were organised for the municipalities where the Rail Baltica route and the 330 kV power transmission line were planned in a single corridor, i.e., the Limbaži, Sēja, Inčukalns, Garkalne, Ropaži, and Stopiņi municipalities.

The EIA Report and its summary were available in all municipalities crossed by the Rail Baltica route, as well as in their websites, and the websites of the initiator of the intended activity and the authors of the EIA Report.

Prior to each public discussion meeting, 1-2h long individual consultations were ensured, including consultations regarding property expropriation and compensation issues. The meetings and the individual consultations were attended by roughly 950 people.

During the public discussion, approximately 60 letters from institutions, municipalities, legal entities and private individuals were received. The proposals received during the public consultation were considered in the clarification of the EIA Report, or explanations were provided as to why the respective proposal was not taken into consideration. For more regarding the public participation activities, see Chapter 10.

Following the public discussion, the EIA Report was complemented, and on 23 December 2015 it was submitted to the Bureau for their assessment.

During the assessment of the clarified EIA Report on 11 February 2016, the Bureau informed about the comments provided by environmental institutions and independent experts and asked for clarification of the report. Report clarifications were related to the new development of additional technical solutions for the alternative C5 crossing over the Vitrupe valley, clarified information regarding the impact on micro-reserves, natural reserve “Dzelves – Kroņa purvs” (“Dzelves – Kroņa swamp”), provision of migration of wild mammals in the section of Rail Baltica crossing the North Vidzeme Biosphere Reserve, importance of the Skultēnu forest in the preservation of bird fauna in the Zemgale region, landscapes in the North Vidzeme Biosphere Reserve, and possible emergency situations and the expected consequences, as well as a prepared additional justification and explanation regarding the credibility of the data used for the hydrological assessment. The EIA Report was complemented with calculations regarding the expected volumes of greenhouse gas emissions.

Figure 20 ***Recommended option of EIA (EIA report)***

Figure 21 ***Accepted intended activity – infrastructure line of Rail Baltica railway***

Source: Annex No. 1 to Order No. 467 of the Cabinet of Ministers.

On 31 March 2016, the updated volumes of the EIA Report was submitted to the Bureau and posted on the Internet. Opinion No. 5 on the Report of Environmental Impact Assessment caused by construction of European standard gauge public railway line, issued by the Bureau, was received on 3 May 2016. The Bureau expressed therein an opinion that the implementation of the intended activity is permissible, and recommended conditions for the implementation of separate stages, including the indication that the C5 section was non-compliant with the regulatory framework on construction in the NATURA 2000 natural reserve “the Vitrupe valley”.

On 4 June 2016, the updated volumes of the EIA Report was submitted to 15 (fifteen) municipalities.

In accordance with the Law on Environmental Impact Assessment and the Railway Law, the intended action, foreseeing construction in the European transport network (TEN-T) and being included in the list of priority objects thereof, shall be accepted by the Cabinet of Ministers. Municipalities were able to express their opinion on the draft order of the Cabinet of Ministers via the Latvian Association of Local and Regional Governments (LALRG). Prior to the order of the Cabinet of Ministers, the Ministry of Transport repeatedly consulted with the Nature Conservation Agency and the State Inspection for Heritage Protection indicated in the Bureau’s opinion, in order to make sure there would be no impediments for the construction of Rail Baltica.

The Cabinet of Ministers of the Republic of Latvia examined the draft decision on the accept of the intended activity for the Rail Baltica route in the sitting on 9 August 2016 (Agenda item No. 2.4, Minutes of the Meeting No. 39, 35 §.). Order No. 467 "Regarding Accept of the Intended Activity for the Construction of European Standard Gauge Public Railway Infrastructure Line Rail Baltica" has entered into force on 24 August 2016. (Figure 21).

During the process of the EIA, assessment of the transboundary impact was performed. The executor developed a document “Summary of the environmental impact assessment for construction of the European standard gauge public railway infrastructure line Rail Baltica in context of transboundary impacts” in English, Estonian and Lithuanian, which was sent to the ESB (ENG) on 25 November 2015. The basic principles of the transboundary EIA procedures are set forth by the Espoo Convention (adopted pursuant to Law “Regarding Espoo Convention of 25 February 1991 on Environmental Impact Assessment within Transboundary Context” – 11 June 1998). The notification of the states concerned is a duty of the Ministry of Environmental Protection and Regional Development (VARAM), whereas the public discussion in Lithuania and Estonia is being organized by the competent ministry of the respective country. On 09 January 2016, the Ministry of Environment of the Republic of Lithuania organized the public discussion meeting regarding the transboundary impact of the Latvian section of *Rail Baltica*, which took place in Panevezys, Lithuania on 09 January 2015. The Ministry of Environment of the Republic of Estonia sent out a letter informing that no public discussion meeting would be organized, however, information would be provided for the society. In the letters dated 11 February 2016 and 22 March 2016, the ESB sent out comments regarding the EIA Report of the Latvian section of *Rail Baltica* to the Ministry of Environment of the Republic of Lithuania and the Ministry of Environment of the Republic of Estonia. The prepared replies and translation thereof in English were submitted to the ESB on 31 March 2016.

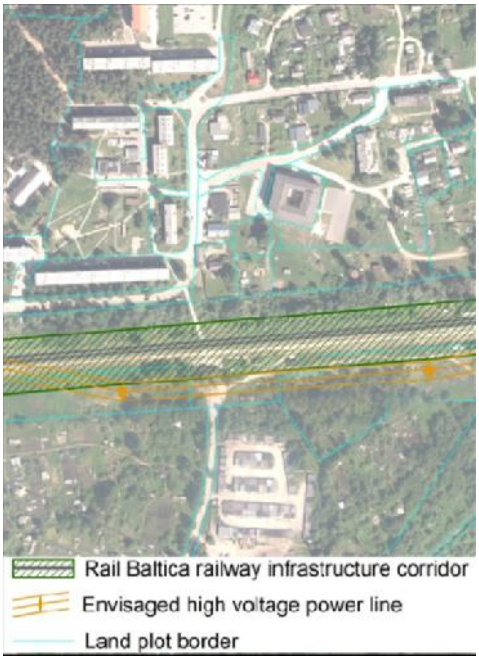
5. ELABORATION OF RECOMMENDATIONS ON THE RAILWAY ROUTE ALIGNMENT

In order to prepare the alternatives un assess environmental impact of the intended acticity, actual graphical data and textual data on land units, buildings, owners, types of use of land and buildings, areas, etc., have been received from the State Land Service “National Real Estate Cadastre Information System” and cadastral data have been depicted on the topographic map and the orthophoto map of Latvian Geospatial Information Agency.

Within the EIA study, the reconstruction areas of the Rail Baltica railway corridor and infrastructure were aero-photographed and laser-scanned for a total length of 500 km to obtain actual information about the current land use and the current situation. The orthophoto map showed the rail tracks, fencing, embankments, recesses, and the envisaged crossings of the Rail Baltica railway and roads, communication pipelines and animal crossings, the Rail Baltica depot areas, the power supply line, and land unit borders.

In order to facilitate the public consultation process during the EIA, the electricity poles and cables of the designed 330 kV power transmission line (designed by Latvian Power Supply Networks) were also depicted on the maps and included in the public materials (Figure 22).

Figure 22 ***Area subject to aerophotography and laser scanning and the Rail Baltica corridor***



The aerophotography and laser scanning was carried out with Litemapper 5500 (assembled by the German company IGI), which was equipped with the aviation laser scanner VUX-1 of Riegl, and a multi-camera RGB system with a total resolution of 108 Mpix. The achievable density of the laser data dots is up to 20-30 dots per square meter depending on the speed and height of the plane.

A three-dimensional digital earth surface model was elaborated. An orthophoto of the whole route was drawn up with a pixel resolution 3-4 cm, and the average accuracy of 20 cm. The characteristic surface dots were elaborated in xyz text format, and transferred to the graphical environment of *.dwg and *.dgn formats (total length ~500 km). The model was used to develop the longitudinal section of the route, the noise map, and route visualisations, as well as a high resolution three-dimensional dynamic visualisation for 328 km of the area of the EIA alternatives.

The accepted line of Rail Baltica was subject to a topographic measurement of 1: 500 scale for a 60 m wide corridor on average, which is sufficient to place the railway infrastructure and its related structures, and which also includes the relevant railway protective belts for Rail Baltica. At the places where the existing infrastructure is planned to be reconstructed (e.g., roads), the topographic measurement was performed for a wider area, which is necessary in order to reconstruct the respective transport and communications crossings, as well as for the Vangaži technical maintenance facility, the Acone passenger train maintenance facility, the Salaspils multi-modal cargo terminal, Riga Central Railway Station, and the Rail Baltica passenger terminal at Riga International Airport.

The topography of the city or Riga and the existing 1 520 mm railway situation were measured manually with digital tachimeters. Within Riga and in several places outside of Riga, the topographic measurements taken no more than 24 months prior to the commencement of the Study were collated, and their compatibility with the surface situation on the EIA routes was verified against aerophotography and the laser scanning outcomes performed in the spring, summer and autumn of 2015. The compatibility with the communication locations for the recommended alternative was also verified.

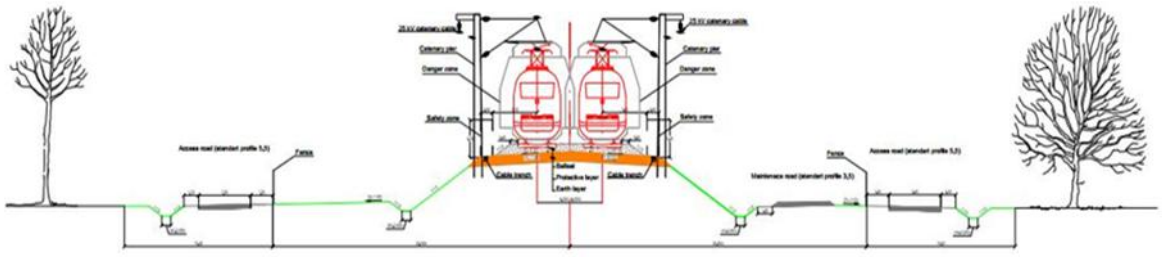
Geodesic and topographic works were carried out in the Latvian geodesic coordinate system (LKS-92) and the Baltic height system of 1977.

The technical solutions of the railway were elaborated in AutoCAD with the scale precision of 1: 500 and converted to ArcGIS, then merged with the recent orthophoto map, and processed to be depicted on maps with a scale of 1: 10 000.

For the accepted line, a sketch design was elaborated on a topographic plan at the detail of a scale of 1: 500 scale, indicating the location of rail tracks, crossings over water bodies, road crossings, and roads to be constructed and reconstructed, as well as engineering constructions relevant for the operation of Rail Baltica – traction power substations, 110 kV traction power substations, and the feeding line Skulte-Salacgrīva, the technical maintenance facility near Vangaži, the passenger maintenance facility near Acone, the Salaspils inter-modal cargo terminal, the Rail Baltica station at Riga Central Railway Station, and the Rail Baltica station at Riga International Airport.

At the stage of the EIA initial public discussions, the land owners with properties affected by the 300 m wide Rail Baltica corridor and the even wider infrastructure reconstruction areas were informed (almost seven thousand properties in total). Since one owner (legal possessor) owns several land plots, on 19 and 24 February and on 7 September 2015 individual letters were sent out to 4 812 owners by post, incl. 91 to foreign addresses (the data on registered juridical addresses of legal entities and residence places of private individuals were retrieved from the State Land Service “National Real Estate Cadastre Information System”, where they are incorporated from The Office of Citizenship and Migration Affairs).

Figure 23 ***Standard cross-cut of the Rail Baltica railway***



During the Study, the area necessary for the construction of Rail Baltica was specified to a 60 m narrow corridor (see the standard cross-cut in Figure 23) and the areas of the terminals and other relevant railway infrastructure (the Vangaži station 22 ha, the Acone depot 14 ha, the cargo terminal in the Salaspils municipality 100 ha), and in the EIA Report it was clarified that the Rail Baltica alternatives affect a total of 3 279 land plots. Thus, the number of owners and legal possessors was reduced by half. The land plots affected by the EIA alternatives were analysed in terms of land use, areas, and construction activities (design, construction, detail plans) in the lands to be expropriated.

The recommended route and the areas of the related infrastructure (terminal, etc.) affect **1 680 land properties**.

Figure 24 ***Standard cross-cut of Rail Baltica and the third Estonia-Latvia power transmission (330 kV) interconnection***

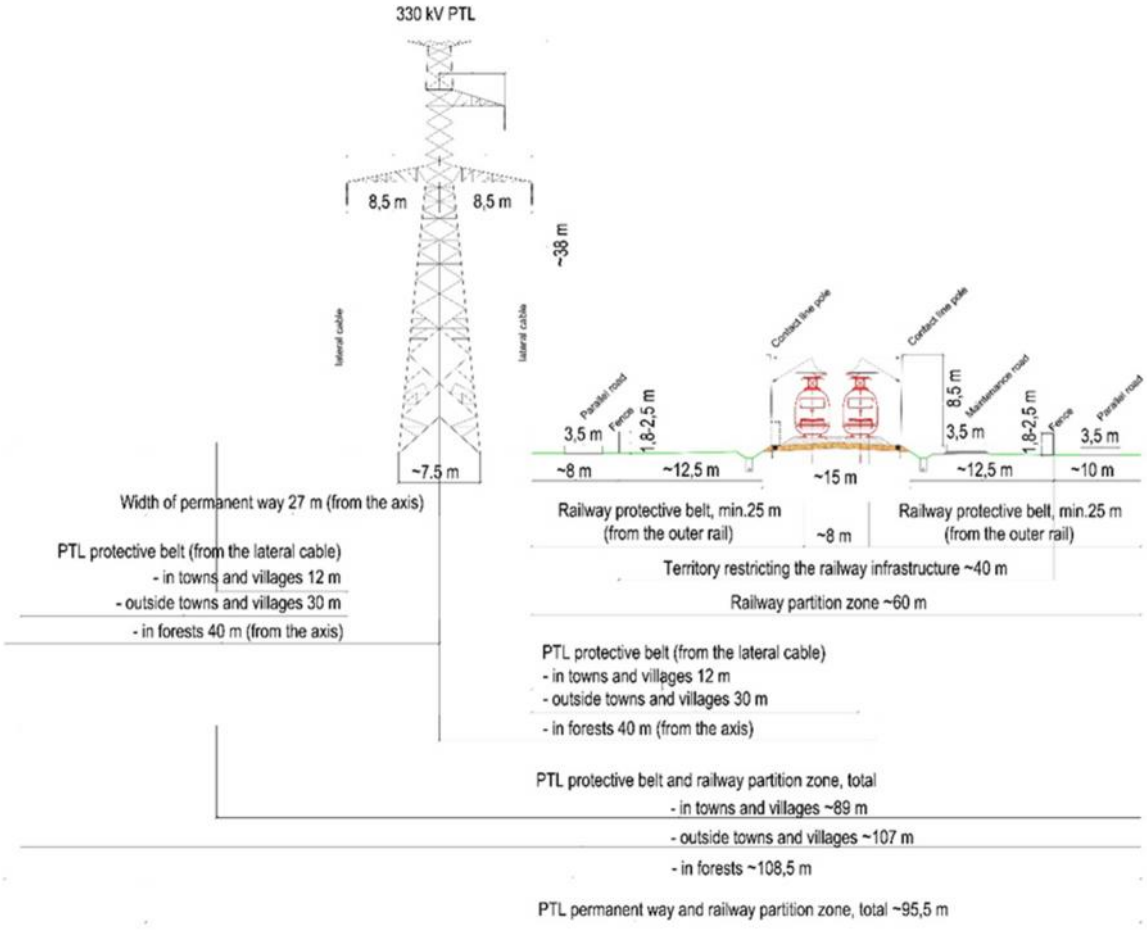


Figure 25 ***Standard location of the Rail Baltica railway in a forest within a single corridor with the envisaged 330 kV power line***

Railway right of way (60 metres wide) will also include a railway protection belts. In the railway sections where Rail Baltica shares a single corridor with the third Estonia-Latvia power transmission 330 kV interconnection (in the municipalities of Limbaži, Sēja, Inčukalns, Ropaži, Garkalne, and Stopiņi), the total encumbered corridor will be roughly almost 100 m wide (Figure 24, Figure 26).

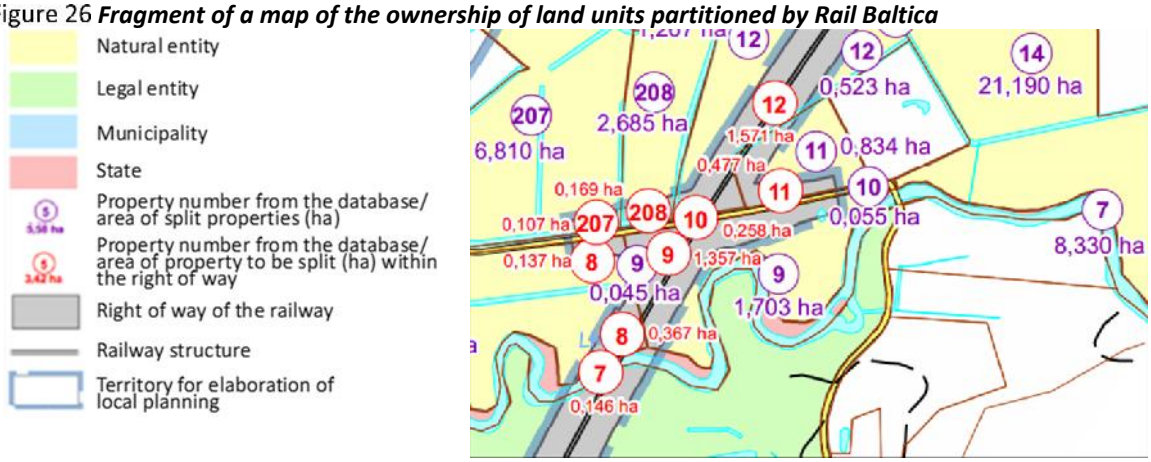
During the Study, issues were identified as to how **the railway as a linear construction affects land properties**:

- The local land structure will change. For some of the properties a part will be cut off, some smaller properties will be expropriated, and some large ones will be divided into several parts.

- The local road network will change. Not all road crossings will be kept, and new access roads to the divided properties will be built.
- During the expropriation process, non-usable inter-areas of land plots will form, since in accordance with the law on expropriation of immovable properties for public purposes and law on prevention of squandering of financial resources and property of public entity, only the areas strictly relevant for the construction of Rail Baltica can be expropriated.
- During the expropriation process, the remaining area of the land plot could differ from the minimum land plot area and the configuration parameters set in the municipal building regulations, and thus their building rights would be restricted. However, according to Article 16^1 of the Land Survey Law, the remaining part shall not be expropriated if the owner and the authority that expropriates the property for public purposes can come to an agreement.
- Agriculture and private forest land management may become more complicated due to longer access routes after the closing of local roads.
- The landscape value may be affected.

The Detailed technical study analysed the areas to be expropriated for the construction of Rail Baltica, the areas of the partitioned land units and the ownership of the land units as the expropriation process of the public sector lands differs from the expropriation of private lands (Figure 26). It was analysed which functional zone of the spatial plan refers to the remaining land, and whether the part to be partitioned complies with the requirements of land usage and the building regulations regarding the minimum area and acceptable configuration of a new land unit.

Figure 26 ***Fragment of a map of the ownership of land units partitioned by Rail Baltica***



For the sections where Rail Baltica uses the land of the existing 1 520 mm railway, expropriation is relatively easier since the land structure is not disarranged, and only the relevant corridor is cut off from the nearest land plots. This is the case in the Riga section where the first implementation stage of the Rail Baltica construction will be carried out. In all the other sections, the expropriated corridor will split up land properties.

In order to come up with recommendations on the expropriation of property, Latvian **laws and regulations with regards to expropriation and compensation** were studied in accordance with the Terms of Reference. Rail Baltica is the largest construction project since Latvia regained its independence in 1990, and several improvements to the Latvian law shall be introduced in order to ensure the public interests and to protect the rights of individuals.

In 2015, the Ministry of Transport procured a separate study "Determination of fair compensation for immovable properties, which are necessary and shall be expropriated for public purposes, and for losses for properties affected indirectly and which have imposed restrictions of economic

activity, or indirect losses due to the implementation of a transport infrastructure project”, which was carried out by an attorney at the law firm “Borenius” (now – an attorney at the law firm “Cobalt Legal”) and which evaluated the Latvian and the EU case law regarding the implementation of transport infrastructure projects. The findings of this study were considered in the recommendations of the Detailed technical study regarding expropriations.

In accordance with the legislation of the Republic of Latvia, one of these options can be used in order to re-structure the borders of land plots affected by Rail Baltica and to corroborate the property rights on railway right of way:

- Expropriation by consent (purchase) of lands and buildings, which includes an agreement between the state and the owner regarding the expropriation value, including the compensation for losses;
- Compulsory expropriation (purchase) of lands and buildings, which includes a consultation process with the owner but does not come to an agreement, in this case the law on real estate expropriation required for Rail Baltica has to be adopted;
- Consolidation of lands.

Already during the Study, the Ministry of Transport and the State Land Service informed about the necessity to speed up the elaboration of the regulations regarding land consolidation. Land consolidation is a new set of measures in Latvia, which aims at a complex re-structuring of the borders of land in order to establish a reasonable structure of land plot areas, to promote the development of infrastructure and areas, and to promote environmental protection (Land Governance Law, in force since 01/01/2015).

For the accepted railway line, developed on a topographic plan of 1:500 scale, areas to be expropriated are shown. The affected real estates are:

- 1590 land parcels (the number of people who owe properties is smaller);
- 104 buildings in the Railway right of way and 30 buildings in areas of the related infrastructure and crossings;
- 34 engineering structures in the Railway right of way and 39 engineering structures in areas of the related infrastructure and crossings.

Figure 27 ***Recommended area for the expropriation (example)***

In the process of expropriation, it is recommended to take into account:

- In accordance with the Law on immovable properties intended for expropriation for the purposes of public and the Law on prevention of embezzlement of public person’s financial resources and property, **only areas needed for the construction of Rail Baltica** are to be expropriated.
- Decisions about **unusable plots and additional land plot expropriation** must be made in case of exceptions if (1) it is impossible to come to agreement with the owners, (2) land plot part to

be partitioned does not comply with the minimum area of a new land plot and (3) it is impossible to develop a consolidation project (the Cabinet of Ministers regulations about land consolidation project development have not come into force).

- **Eliminate shared property rights** in accordance with Railway law (Article 15 part 1 determines that land within the state public use railway infrastructure land railway right of way is state property), therefore expropriate land under scaffold bridges and other engineering structures that form the land plot and air space marked off by supposed vertical surfaces.
- Expropriate the land needed for the construction of **access roads** to real estates, necessary for the construction of existing state and municipal road crossings and utilities' crossings.
- Expropriation must be **commenced with Riga section** where construction within the first phase of project is intended. Also, as soon as possible must commence the expropriation in the other sections, given that the process will take a long (up to 3 years) time.
- Taking into account the common corridors developed in Research project, a total length of almost 100 km (Figure 17.), **continue collaboration with infrastructure holders** (LET, LVC, LDz) in the land expropriation process and evaluate collective restrictions on properties.
- Take part in the development of **legislation** (consolidation projects' development procedure) and in the improvement of expropriation legislation so as to use Rail Baltica project to give a collective contribution to Latvian legislative environment;
- Continue **individual approach to each private owner** as initiated in the research project. The e-mail account info@railbaltica.info and the phone have been placed at the Beneficiary's disposal along with a database of contacts developed during Research. Continue maintaining the informative phone and the informative e-mail.
- During Research project, a collaboration with municipalities and utilities' holders has been initiated, coordinating technical solutions, receiving technical requirements for further building design and requirements for territory planning. During the process of expropriation, **a common understanding must continue to be developed with owners of public administration sector and legal holders** (municipalities, LVM, LDz, LG, ZM, IeM, TM, VARAM, International airport "Riga"", municipal entity "Rīgas meži"). An agreement about the maintenance of Rail Baltica constructed crossings must be made (road maintenance), as well as coordination of Rail Baltica time plan and institutional action plan.
- **Continue informing the public,** incl. railbaltica.info website's functionality, incl. line's visualization in Google maps.

In result of the Detailed technical study, a detailed overview was prepared regarding the properties to be expropriated, including visual materials, technical solution and cadastral data from State Land Service, a price per 1 m^2 of land by types of use, areas to be expropriated by types of use, factors which might impede the land expropriation (e.g., mortgages, building to be demolished, etc.). Issues with the demolition, relocation or preservation of the buildings, and measures against noise and other type of pollution have to be done according to recommendations mentioned in the report of EIA and the Opinion of the Environmental State Bureau.

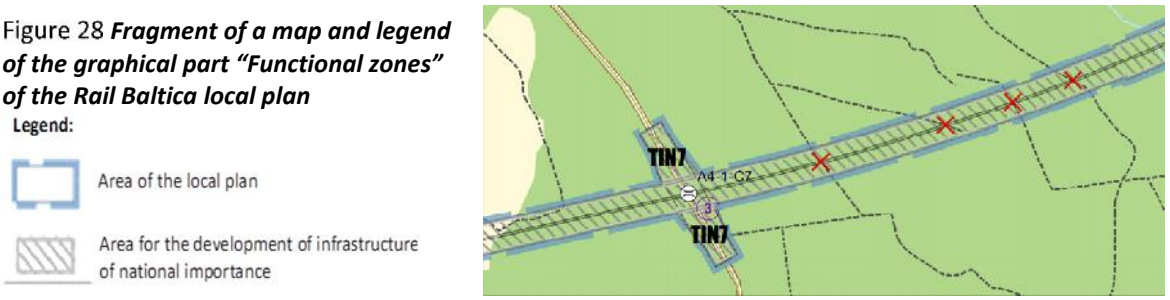
Early, during the initial EIA public discussion period, communication process was commenced with affected land plot owners, and expanded during the next steps of the Detailed technical study. All necessary materials for receiving written conceptual agreements from the owners of the properties to be expropriated were prepared on the Rail Baltica route accepted by the Cabinet of Ministers (see Chapter 4). Taking into account the implementation of the 1st stage that had to be started at the end of 2016, it has been agreed that information process of the land owners will be done at the beginning of the construction process as it is determined in the Law on expropriation of immovable properties for public purposes.

Territories necessary for the construction of Rail Baltica are reserved in the **spatial development planning documents**. Rail Baltica is integrated into the hierarchically highest spatial development planning document of Latvia – Sustainable Development Strategy of Latvia until 2030, approved in 2010. Rail Baltica is integrated into the strategies until 2030 of the Riga planning region and Zemgale planning region. Rail Baltica is integrated into the strategies of the local municipalities, including Inčukalns municipality, the strategy of which was updated during the Detailed Technical Study. Rail Baltica is integrated in the most of the municipal land-use (territorial) plans; however, in the maps which are elaborated on a scale of 1: 10 000, the reserved corridor based on the Feasibility Study does not fall into the accepted route alignment in the Detailed technical study.

Within the Study, the **local plans of Rail Baltica– amendments to the municipal land-use plans** (territorial plans) have been elaborated in the municipalities crossed by the envisaged railway line Rail Baltica. Local planning have been done based on three-sided contracts, where the Ministry of Transport was the initiator of the planning, GP “RB Latvija” was the elaborator of the documentation and maps, and the municipality adopts the plans. The necessary procedures of adoption and public information in the municipalities are in process in accordance with the legislation of the Republic of Latvia.

Local plans have been made in the following way: The graphical part of the local plan depicts the zone with special regulations “Zone for infrastructure of national significance”. The Building regulations determine the allowed usage – Rail Baltica railway infrastructure and related infrastructure. The existing usage of the land plots can be continued up to the beginning of the construction of Rail Baltica, except building new houses and public and commercial objects (Figure 28).

Figure 28 ***Fragment of a map and legend of the graphical part “Functional zones” of the Rail Baltica local plan***



The thematic maps of the local plan generalizes technical solutions and shows localisation of the crossings of main roads, communications, and the envisaged animal crossings.

Local plans also abolish building restrictions in the previously reserved transport corridors based on the Feasibility study.

Compliance of the Rail Baltica railway line alignment with the municipal land use (territorial) plans is important in order to restrict the construction of new civil buildings in the land, reserved for the Rail Baltica thus avoiding increasing compensation value. Compliance with the municipal land use (territorial) plans is not necessary regarding to initiation of the Rail Baltica construction process, as it is ensured by the status of the object of national interests.

6. ELABORATION OF TECHNICAL SOLUTIONS

For the environmental impact assessment, standard technical solutions were elaborated for the alignment of the railway line on site and the crossings of the existing infrastructure.

For more complex sites, individual technical solutions on a scale of 1: 1000, and in some locations on a scale of 1: 200, were elaborated, as stipulated by the Terms of Reference of the Study and the level of detail set in the EIA programme.

The technical solutions of the Rail Baltica options elaborated for EIA complied completely with the TSI requirements for the railway category P2/F1 and the Common principles' input data and key parameters of the line. Thus in EIA, the general public was provided with completely compliant and equivalent route options of the envisaged Rail Baltica.

The standard solutions for the recommended route were redesigned as individual solutions in accordance with the situation on site and the topographic measurements performed for the recommended route.

All options approved by the Contracting Authority were subject to an **engineering study** at various levels of detail. For the purposes of EIA, a large-scale desk study, collation and analysis of the information regarding historical engineering studies and borehole drilling was carried out in the Latvian-Lithuanian border area in order to assess, in cooperation with Lithuanian experts, the possible impact of karst processes on the selected Rail Baltica route alignment in the Latvian-Lithuanian border area. Since no impact of karst processes was observed, it was possible to agree on the planned Rail Baltica route alignment in the Latvian-Lithuanian border area defined in the Feasibility study.

Considering the available data from other previous engineering studies, boreholes for the accepted route were drilled at a depth of at least 5 m and were evenly distributed in order to obtain an overall view of the geological circumstances in the place where the Rail Baltica railway route is to be constructed. On the banks of medium-sized and big rivers, boreholes of a depth of approximately 20 m were drilled in order to determine the geological circumstances in the locations where the support poles for the bridges are intended to be constructed. The deep boreholes were also drilled in the place where the Torņakalns tunnel (EIA alternative C2) was planned to be constructed.

In terms of geology, the most complex place for the railway line is a section near Saulkalne where the gypsum layer is located close to the surface of the earth, which creates a risk of potential karst processes. In this location, the gypsum layer shall be extracted by its owner Knauf Ltd., who will use it as a mineral deposit in their production process. Following the extraction of gypsum, it will be replaced with solid ground, which in turn will be compressed to a level relevant for transport construction.

These **detailed technical solutions** have been elaborated for the recommended route of Rail Baltica:

- the railway line plan with the geometric parameters of the railway route in accordance with the TSI category P2/F1;
- the longitudinal profile of rails ensuring upgrades in accordance with the TSI category P2/F1;
- cross-cuts of the railway right of way with the railway constructions above ground; for complex places – individual cross-cuts indicating the typical parameters (Figure 30);
- schematic layouts of the rail tracks for the train interchange points, inter track connection points (Figure 37), the Vangaži infrastructure maintenance facility (Figure 31), the Acone passenger train maintenance facility, the multi-modal cargo terminal in Salaspils municipality, Rail Baltica stations at Riga Central Railway Station and Riga International Airport;

- rail track layouts at the reconstruction sites of the existing 1 520 mm gauge tracks near the multi-modal cargo terminal in the Salaspils municipality, in the section Preču 2 - Saurieši (Figure 34), Riga Central Railway Station and its accesses;
- solutions of railway bridges, tunnels and cross-overs (Figure 34), front views thereof, typical cross-cuts of span constructions, location of support poles;
- solutions of road crossings – longitudinal profiles of roads, typical cross-cuts of span constructions, location of support poles, clearance cross-cuts (Figure 40, Figure 41, Figure 38, Figure 39);
- the location of traction power substations and their power supply units, access roads to the traction power substations;
- schematic layouts for the location of signalling central devices;
- technical solutions of the maintenance road parallel to the railway tracks and the fencing of the railway infrastructure;
- the Vangaži infrastructure maintenance facility (Figure 31), the Acone passenger train maintenance facility, the passenger terminal constructions with a link to the rail tracks and the passenger service infrastructure (platforms, access to platforms) for the Rail Baltica stations in Riga Central Railway Station and Riga International Airport;
- signalling and telecommunications devices – field equipment, GSM-R towers, devices to secure safe train movement, etc.;
- other related infrastructure – barriers against noise, fencing, public roads parallel to the railway to secure access to immovable properties, etc.

Figure 29 ***Example of a railway longitudinal profile***

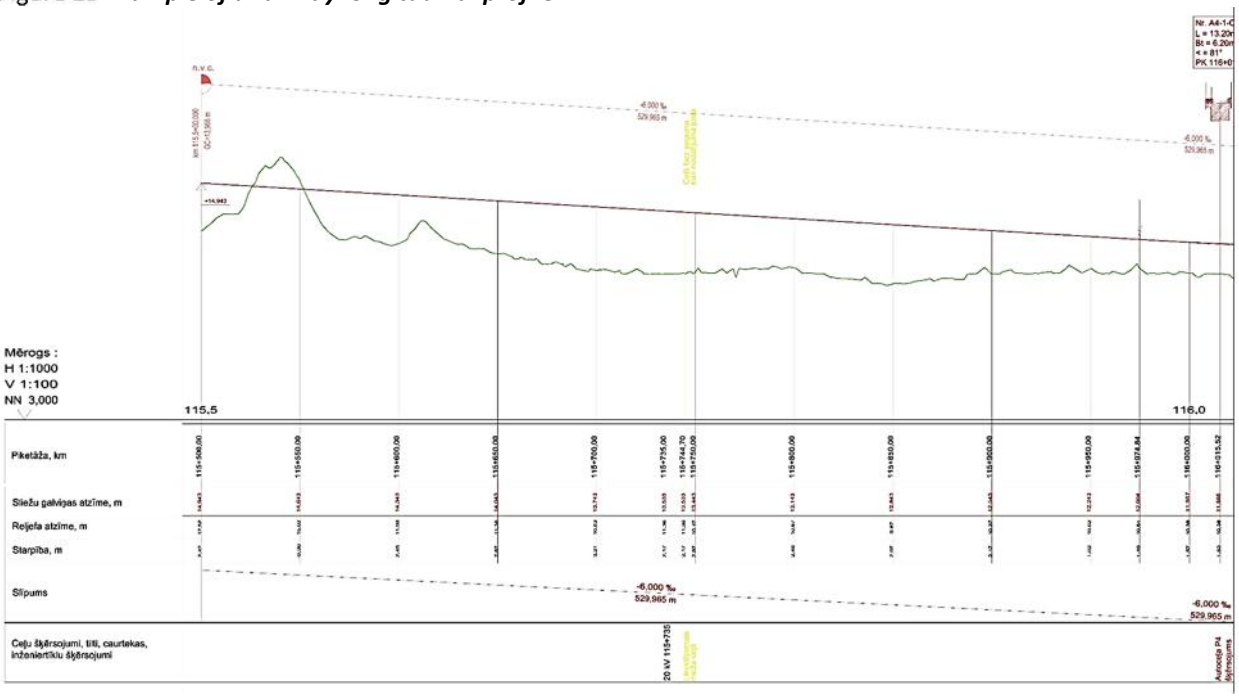


Figure 30 ***Example of a cross-cut of the Rail Baltica railway***

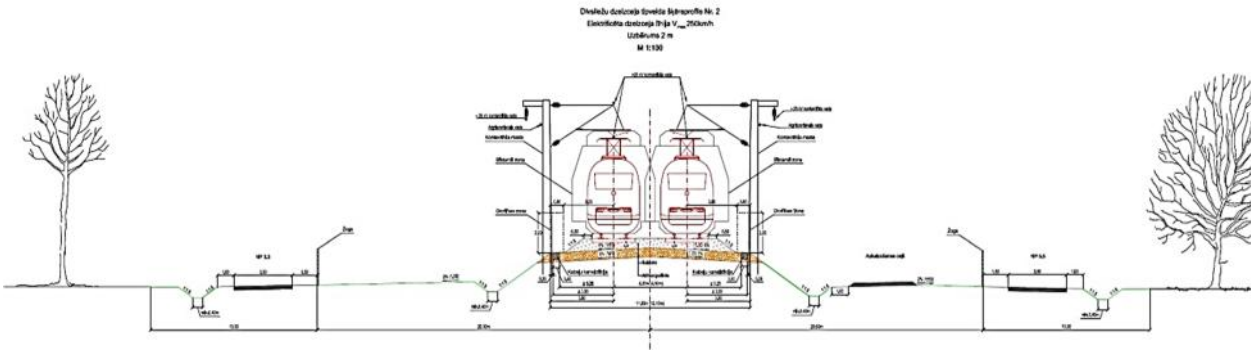
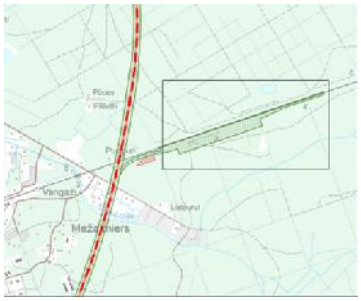


Figure 31 ***Rail track layout in the Vangaži infrastructure maintenance facility***



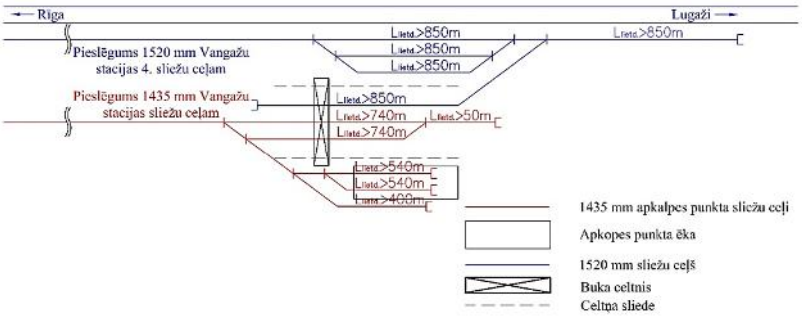
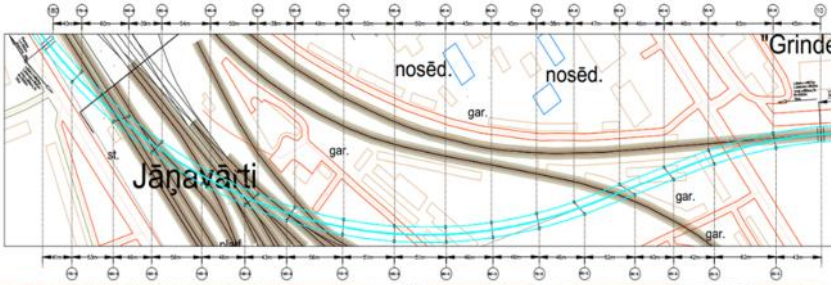


Figure 32 ***Rail Baltica railway cross-over layout in Riga (Šķirotavas parks)***



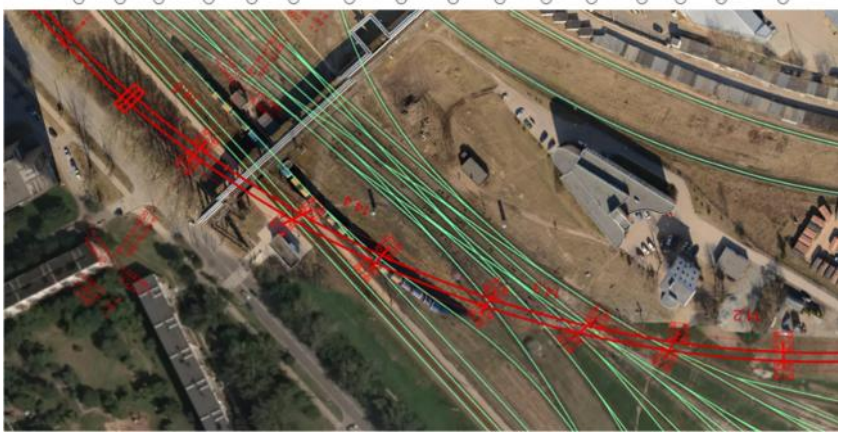


Figure 33 ***Visualization of the existing 1 520 mm railway track crossing in Riga (Šķirotavas parks)***

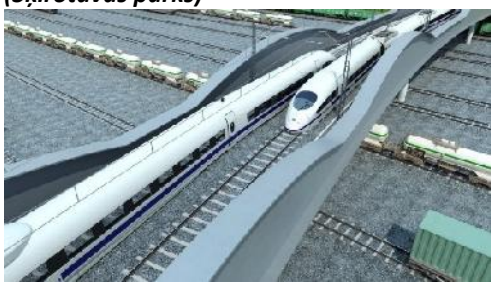
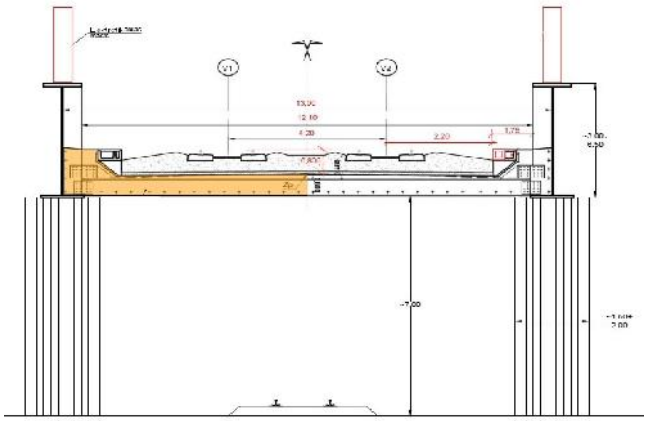


Figure 34 ***Cross-cut of the cross-over construction over the existing 1 520 mm railway track in Riga (Šķirotavas parks)***



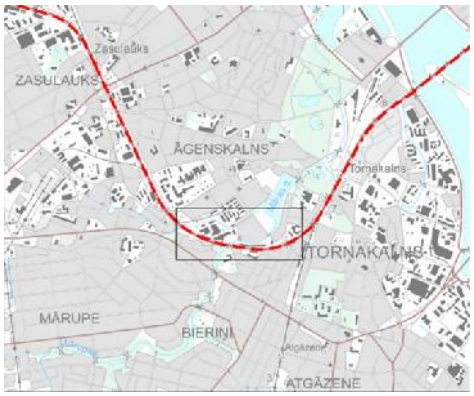


Figure 35 ***Tunnel underneath the existing 1 520 mm rails (Torņakalns), the alternative A***

The railway protection zone was elaborated on average with a width of 60 m. A wider zone was designed in the stations, traction power substations, deep recesses and high embankments, which do not need a retention wall. A narrower zone was designed in the railway sections where all the railway infrastructure lays on the railway platform, i.e. the engineering constructions for bridges, cross-overs. In these places, the width of the railway zone shall be as wide as the projection of the railway engineering constructions on the surface of the earth.

In accordance with the draft train operation plan, the **train interchange points** shall be located after every 50 km (see Chapter 3 Figure 18). The technical solutions include the relevant efficient rail track lengths, switch parameters and the infrastructure relevant for passenger service (passenger platforms) in order to develop the regional traffic in the future within the 1 435 mm rail network.

The Rail Baltica railway plans and layouts of the rail tracks have been elaborated also for the technical facility near the Ādaži military training area.

Figure 36 ***Rail track layout at a train interchange point***

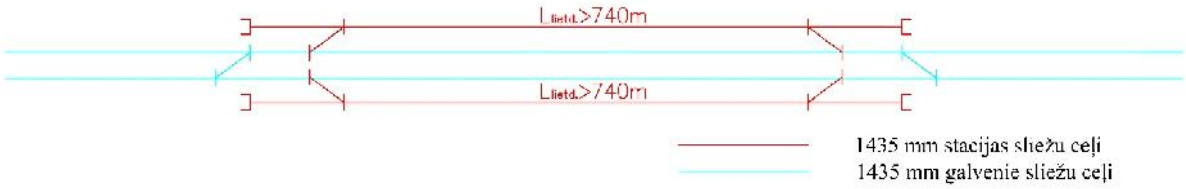
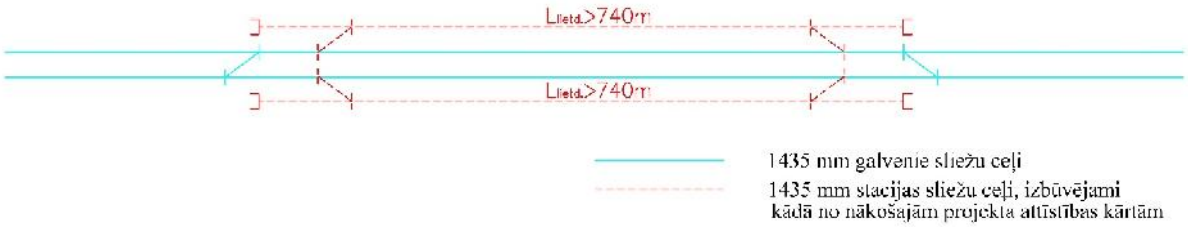


Figure 37 ***Rail track layout of an inter-track connection point***



If there would a need to establish new cargo or regional, intercity and local passenger traffic infrastructure in the future, the regional traffic infrastructure establishment would not require critical reconstruction of the main railway tracks at the places where the train interchange points are planned, since only additional tracks and infrastructure relevant for the cargo train/passenger service (platforms, accesses, etc.) would have to be built.

Based on the estimated technical parameters of passenger, cargo and regional trains on the envisaged Rail Baltica line and the train traffic modelling, the relevant power supply capacity at the peak hours of train traffic has been calculated, along with the respective **traction power substations** and their capacity parameters. The traction power substations shall be constructed near Salacgrīva, Skulte, Stiene, Saulkalne, Baldone and Bauska (Figure 18).

The exact locations of the traction power substations were determined considering also the existing 330 / 110 kV power supply network and the available free capacities for power supply to the Rail Baltica railway line. The only place where the power supply is insufficient is the Salacgrīva traction power substation. In addition to the existing 110 kV line Aloja-Salacgrīva, a new high voltage 110 kV line will be constructed parallel to the Rail Baltica railway as a feeder, which will ensure the basic feeding of the Salacgrīva power substation and include the substation in the 110 kV line network, thus contributing to the power security of the national and cross-border sections of Rail Baltica.

In case of need (emergency situations, damages to traction power substations, etc.), the traction power substations near Bauska and Salacgrīva have been designed in a way that the catenary network can be supplied with power from the cross-border sections in the territories of Lithuania and Estonia.

The technical solutions include the territory necessary for the traction power substation and its access infrastructure by indicating the location of the relevant technological devices and their connections to high voltage feeder networks.

The power feeding of the Rail Baltica related infrastructure (depot, stations, etc.) shall be ensured from the nearby 20 kV power supply networks.

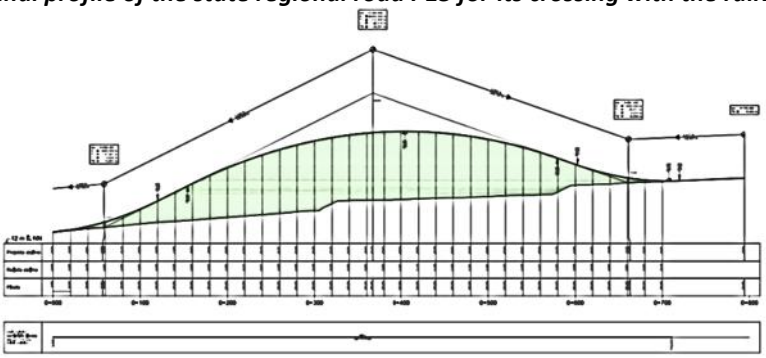
In cooperation with Latvian Power Supply Networks, within their intended activity “**Establishment of the third Estonia-Latvia power supply transmission network interconnection**”, the Rail Baltica railway infrastructure and one of the route options (1b) of the third Estonia-Latvia power supply transmission network interconnection are placed in a single corridor in the section Skulte - Riga TPS-2, and the 330 kV power supply line is placed in a way that its outer cable is located up to 8 m off the Rail Baltica railway route fencing.

Within the Study, information regarding the state **roads** and road projects from the state JSC “Latvijas Valsts ceļi” (Latvian State Roads) (more on state road projects – Chapter 2 Figure 17), information from municipalities regarding the municipal roads, and information from JSC “Latvijas Valsts meži” (Latvian State Forests) and SIA “Rīgas meži” (Riga Forests) regarding the state and Riga municipal forest roads and principal rides has been collated. Individual consultations with entrepreneurs, farmers and other owners provided information regarding the relevant parameters for the

construction of railway crossings and alternative access roads. The recommended route had 145 crossings with roads.

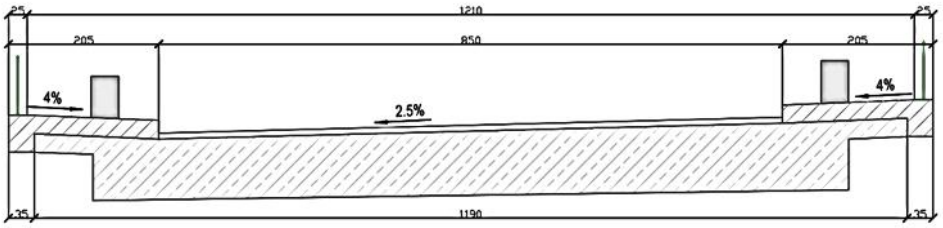
All Rail Baltica crossings with the existing railway, roads and all envisaged roads have been planned to be multi-level after the completion of all of the related road projects (the Anniņmuižas overpass in Riga, the E22 Riga entrance in Saurieši), thus reducing the risk of potential accidents at infrastructure crossings. The road crossings are mainly designed to go over the Rail Baltica railway; however, in the locations where the railway runs on a high embankment, the crossings will go under the railway, ensuring the relevant clearance in accordance with the respective road category and the requirements of the owner of the existing infrastructure.

Figure 38 ***Longitudinal profile of the state regional road P15 for its crossing with the railway***



The technical solutions of crossings include a crossing layout and longitudinal profile (Figure 38), a frontal view of the engineering constructions, cross-cuts and the locations of support poles (Figure 39).

Figure 39 ***Cross-cut of the state regional road P15 for its crossing with the railway***



The parameters of the state road crossings and municipal road crossings (standard sections of roads, clearances, access ramp gradients) have been assumed in accordance with the up-to-date and estimated transport loads and parameters. The standard solutions of crossings with the state main roads are planned at a design speed of 90 km/h. The width of the traffic cross-overs depends on the traffic composition and intensity on the road to be crossed.

Figure 40 ***Overview layout of the state main road A7 crossing***

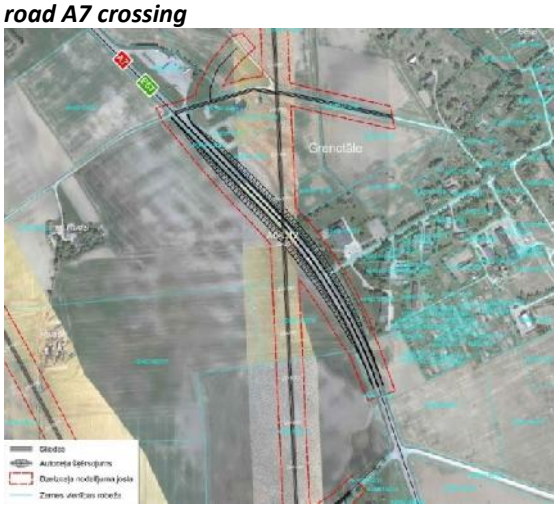
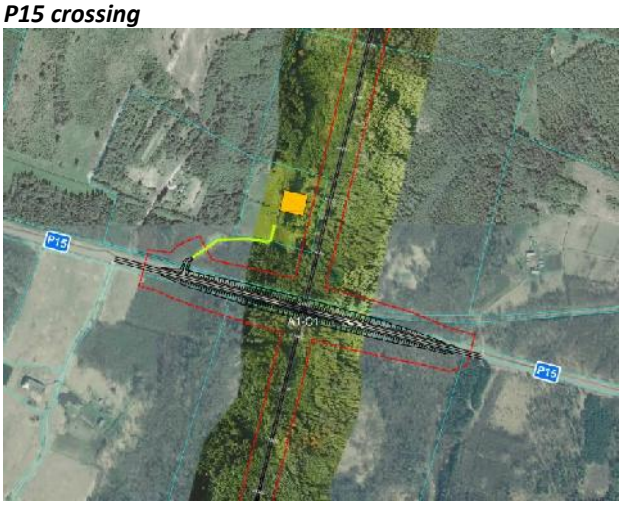
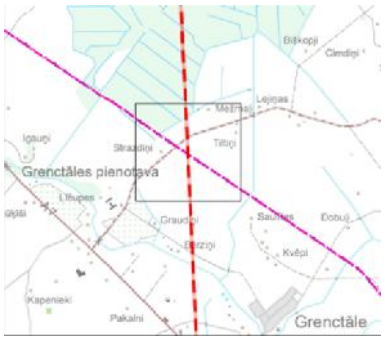


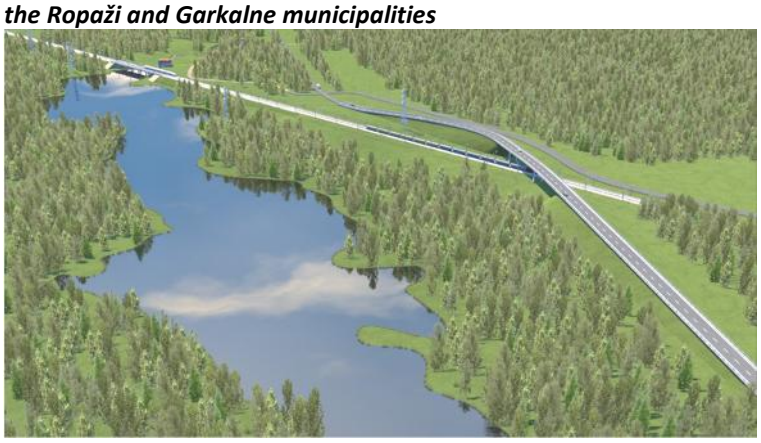
Figure 41 ***Overview layout of the state regional road P15 crossing***





For complicated sites, individual technical solutions and visualisations were elaborated providing the general public with a complete idea of the envisaged Rail Baltica railway line and the planned technical solutions, and an estimate of the impact on the environmental situation by the intended activity (Figure 42).

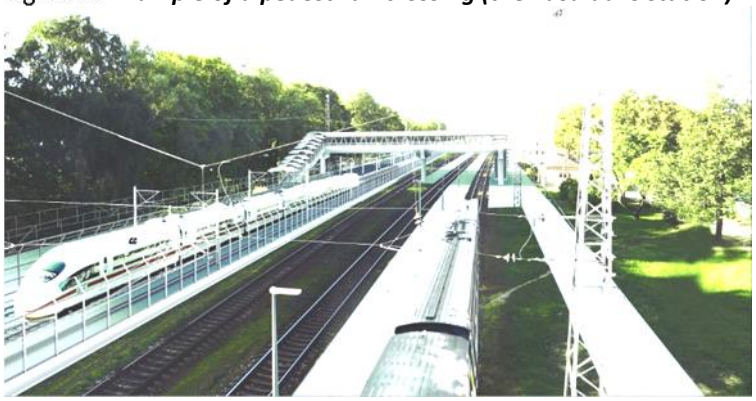
Figure 42 ***Rail Baltica crossing with the state regional road P3 in the Ropaži and Garkalne municipalities***



The crossings with forest roads are planned in the locations determined in cooperation with the respective owner of the forest road – Latvian State forests and Riga forests – in order to ensure the maintenance of forest stands and other forestry activities. The parameters of the forest road crossings were designed to be suitable for forestry machinery.

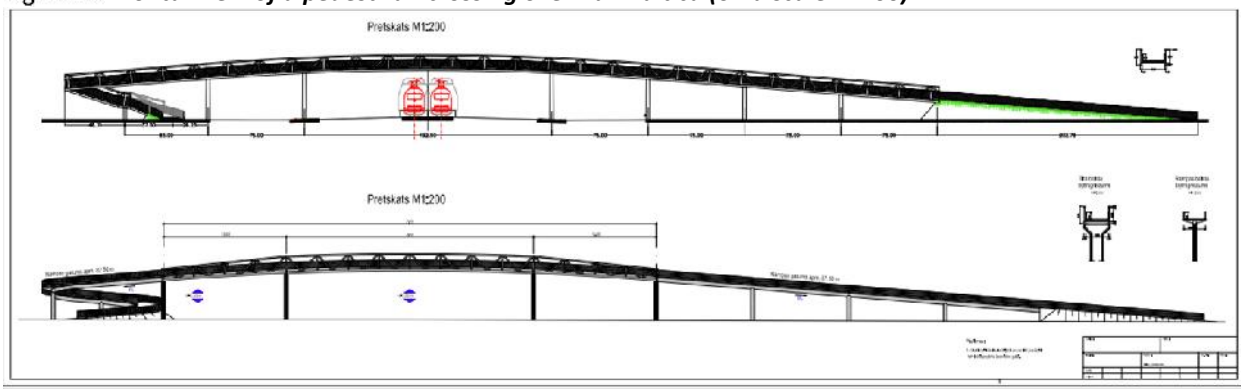
The state and municipal road crossings, along with the crossing itself, will also ensure **pedestrian sidewalks and/or pedestrian/cyclist paths** on one or both of the sides of the crossing, which will provide for a safe crossing of Rail Baltica for the pedestrians and cyclists. For several more complex crossing nodes (e.g., the road P132 near Jaunmārupe), the pedestrian and cyclist crossing is designed as an individual engineering construction due to the configuration of the crossing.

Figure 43 ***Example of a pedestrian crossing (the Zasulauks station)***



In the city of Riga, the pedestrian crossings shall be constructed over the rail tracks of Rail Baltica and the existing 1 520 mm gauge tracks in order to ensure an undisturbed pedestrian movement in the urban environment. 11 pedestrian/cycle crossings at a +1 level are to be constructed in Riga.

Figure 44 ***Frontal view of a pedestrian crossing over Rail Baltica (on a scale 1: 200)***



Where access to private properties and homes is restricted due to Rail Baltica, parallel roads to the railway line will be built and connected to the nearest state, municipal, or forest roads. Once the construction is completed, they will be transferred to the respective parties for management. The newly constructed access roads to commercial or private properties are located so that the nearest railway crossing should not be more than 2 – 3 km away.

During the Study, information was collated on all **principal communications** to be crossed – the main gas pipeline, main oil pipeline, 330 kV and 110 kV high voltage lines, water mains, sewerage pipes, and heating pipes. The key reconstruction of the communications due to the Rail Baltica construction shall affect the main gas supply pipelines and gas technological appliances, which shall be relocated at the distances of the safety protective belts, as well as the crossing of the gas pipes at a straight angle. The other principal communications shall be either increased (e.g., power transmission cables) or decreased (e.g., water pipes) to ensure the relevant vertical distances between the Rail Baltica railway tracks and the communications to be crossed.

During the Study, the owners and legal possessors of the principal communications preliminarily agreed on the crossing solutions and provided requirements regarding the reconstruction or relocation of the communications.

In order to cross the **main gas pipelines**, all the crossings (7 in total) shall be reconstructed at an 90° angle in accordance with the requirements of JSC “Latvijas Gāze” (Latvian Gas). Near Saulkalne, the sections Riga-Panevezys (D 700 mm) and Riga-Daugavpils (D 500 mm) of the main gas pipelines shall be reconstructed in parallel to Rail Baltica and the planned corridor of the state main road A4 in order to ensure enough space for the construction of the Salaspils inter-modal cargo terminal.

Near Gauja and Saulkalne, the technological appliances of the main gas pipelines shall be reconstructed and relocated to ensure the functionality of the main gas pipelines and the appropriate distance to the railway infrastructure at the width of the gas pipe safety protectiion belt.

No special requirements have been imposed on the crossing with the **main oil pipeline,** and the key requirement is not to place the Rail Baltica railway in the recess in this place.

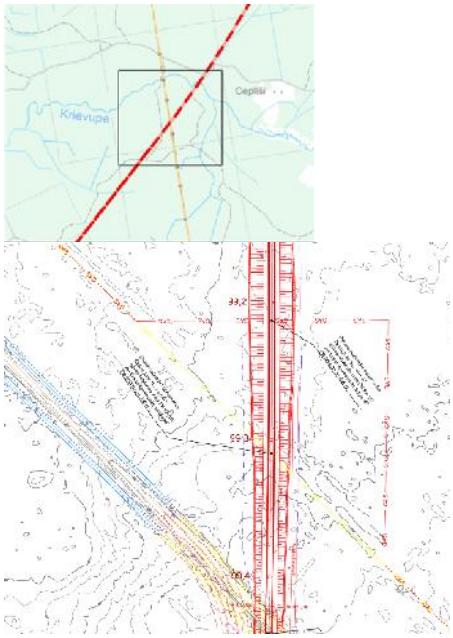


Figure 45 ***Conceptual solution of the reconstruction of the main gas pipeline in the Ropaži municipality***

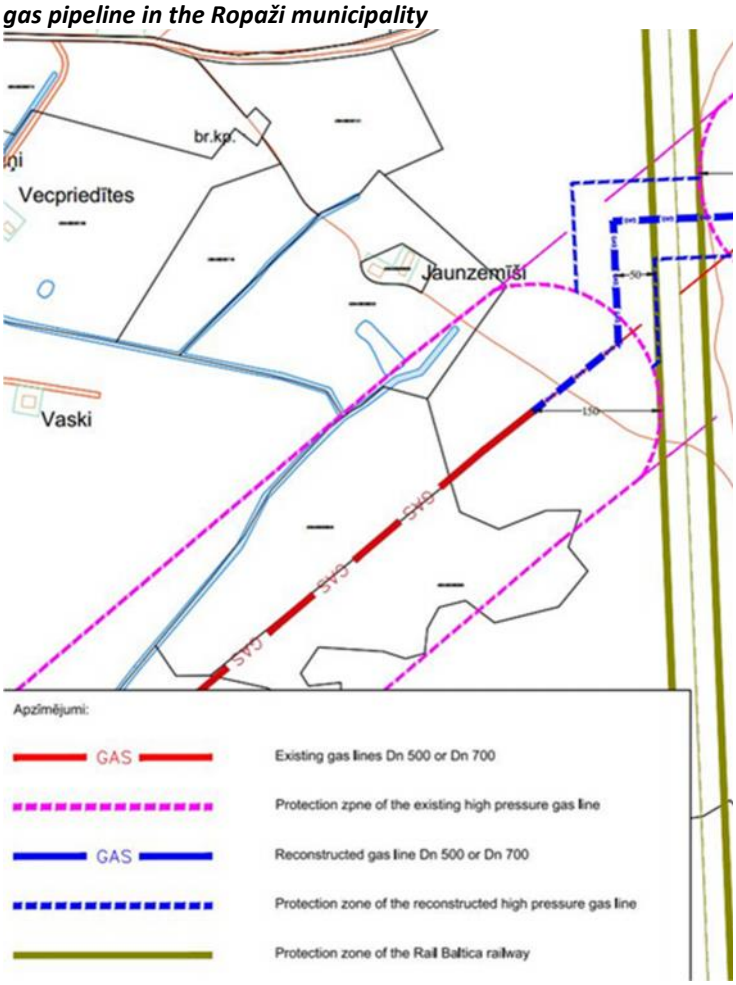
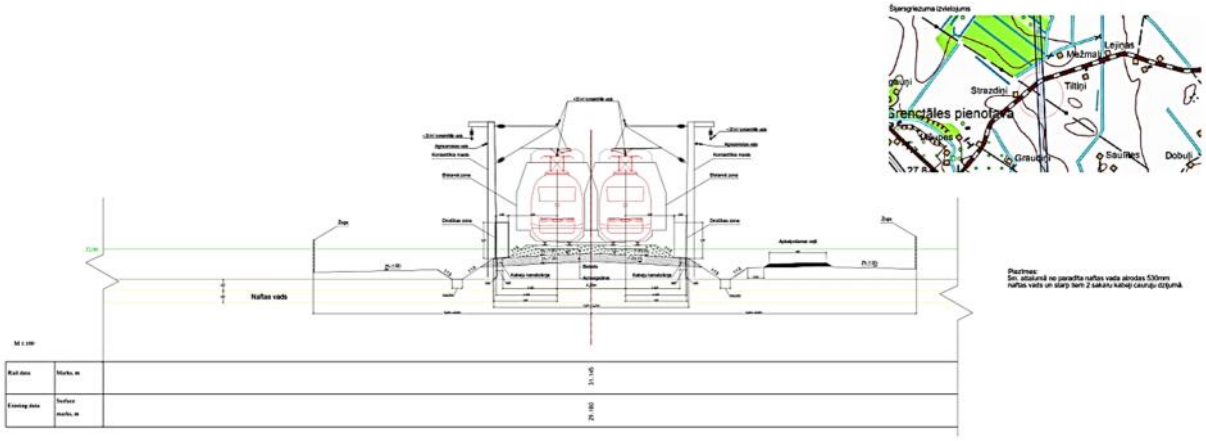


Figure 46 ***Rail Baltica crossing with the main oil pipeline***



Crossing of the oil pipeline has technical requirements to rebuild oil pipeline and telecommunication cabel under 90°, as wellensure additional safety measures (protective hard shell).

The power transmission networks shall be reconstructed in order to ensure the minimum distance from the railway infrastructure (especially from the catenary system) to the lowest cables of the high voltage line. In some crossing places, the support poles of the power lines shall be replaced in order to move up the cables.

Telecommunications. The recommended route of Rail Baltica does not affect the infrastructure of mobile public operators. Subject to an agreement with the owner, the overhead digital communication lines will be moved up, and the underground cables will be lowered. Any other permanent impact on telecommunications is not foreseen, since all of the railway infrastructure systems and the rolling stock will completely comply with the EU standards.

In order to reduce the impact on the state **drainage system and rainwater ditches**, the Rail Baltica railway has been increased by approximately 1,8 m (to the mark of the rail head) on even areas, thus ensuring that all structural layers of the railway are located above ground. Underneath the railway, at the earth level, there are no restrictions to build culverts and small bridges necessary to divert the drainage and rain waters under the railway. On rolling landscapes, where the previously indicated height is lower, the water in the ditches parallel to the railway will be diverted to the nearest culvert or bridge.

For the crossing and reconstruction of the **networks of the public utilities,** the technical requirements from the owners have been received. These requirements are attached to the Terms of Reference for further design.

Figure 47 ***Animal crossing***

Based on the statements of the environmental experts during the EIA study, in 14 locations where the Rail Baltica railway line crosses or is located next to thick forests, **animal crossings (green bridges)** shall be built over the railway (Figure 22). In places where the Rail Baltica route is placed within a single transport corridor with an existing road which is to be reconstructed (e.g., road A5), animal crossings shall be built after the road reconstruction is completed.

Figure 48 ***Bridge over the River Gauja***

Animal migration will be ensured by the clearance under bridges over the big and medium rivers (Figure 48).

The recommended route of the Rail Baltica Latvian section crosses 35 rivers, including the Daugava (1x in Riga and 1x in the Salaspils and Ķekava municipalities), Gauja, Mēmele, Mūsa, etc.

To cross the water reservoir of the Riga Hydroelectric Power Plant (Daugava) near Saulkalne, a 1 150 m long bridge consisting of 19 spans and 20 support poles, including bank support poles (railway bridge Figure 49), is planned. During the Study, the possibility of constructing a multi-modal bridge was considered.

Due to the different parameters of the engineering construction of the railway and the road, and due to the different time schedules for the implementation of both projects, it was preliminary agreed to construct two bridges – one for the railway and one for the road

Figure 49 ***Bridge over the water reservoir of the Daugava hydro power station***

In Riga, the technical solution of a bridge over the Daugava has been designed considering the requirements regarding the protection of Historic Centre of Riga – upstream of the existing 1 520 mm gauge railway bridge, to commensurate with the existing bridge solutions, and to allow for navigation clearance underneath it.

Figure 50 ***Bridge over the Daugava in Riga***

For the Rail Baltica Latvian section, there shall be 176 crossings with roads, the existing 1 520 mm railway, rivers and main communication lines (Table 4).

Table 4 ***Crossings of the accepted route of Rail Baltica with rivers and other infrastructure***

Type of crossing	Quantity
Road crossing, incl.	101
Bridge over a river	28
Crossing of a power line	19
Crossing of a gas pipeline	6
Communication corridor	8
Railway crossing	11
Tunnel underneath a river	1
Culvert (Marupite)	1
Crossing of an oil pipeline	1

Figure 51 ***Total noise level after the completion of the Rail Baltica construction***

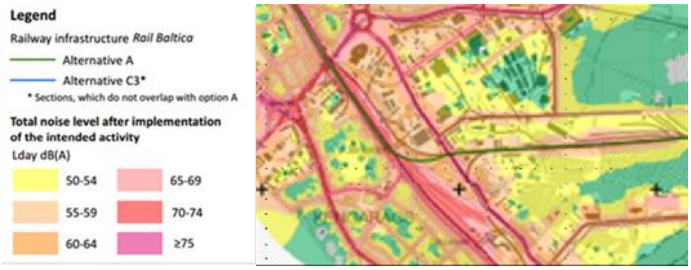
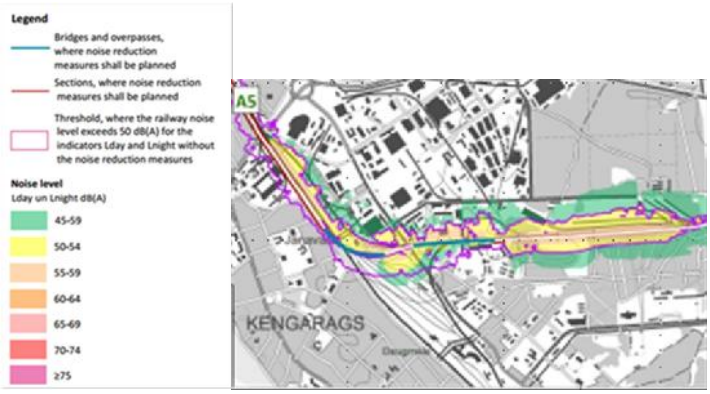


Figure 52 ***Rail Baltica noise level after implementation of noise reduction measures***



Noise modelling for the EIA options determined the sections of the route where the noise by the Rail Baltica railway will exceed the thresholds set by the law on both sides of the railway line totalling to 100 km, and a total of 30 km where it will be exceeded only on one side.

During the Detailed technical study, technical solutions to reduce the impact of noise and vibrations were elaborated in accordance with the noise modelling outputs. In these locations, by determining the height of the Rail Baltica tracks, and by considering the up-to-date maximum admissible noise levels and the determination methodology thereof (amendments to the respective laws and regulations are expected), it might be necessary to determine the most suitable noise reduction measures for particular locations (barriers against noise, protective greenery, noise dampers on the track grid, etc.) during the elaboration of the Technical project.

In accordance with the technical solution **at Riga International Airport**, the railway corridor in the airport territory will be located in the initially planned direction of North-South, on the eastern side of the existing aviation roads that run in parallel to the planned railway (Figure 53).

In accordance with the international agreement regarding the key principles of the Rail Baltica technical solutions, initially, a passenger terminal suitable to serve 220 m long passenger trains shall be constructed (Stage 1), however, additional space shall be reserved for the technical possibility of the construction of a passenger train service infrastructure in the future (incl. a terminal for up to 420 m long passenger trains). [5] The Rail Baltica railway will be placed on a +1 level, thus ensuring at least a 5m clearance underneath it, which will allow for a free access to the territories on both sides of the railway.

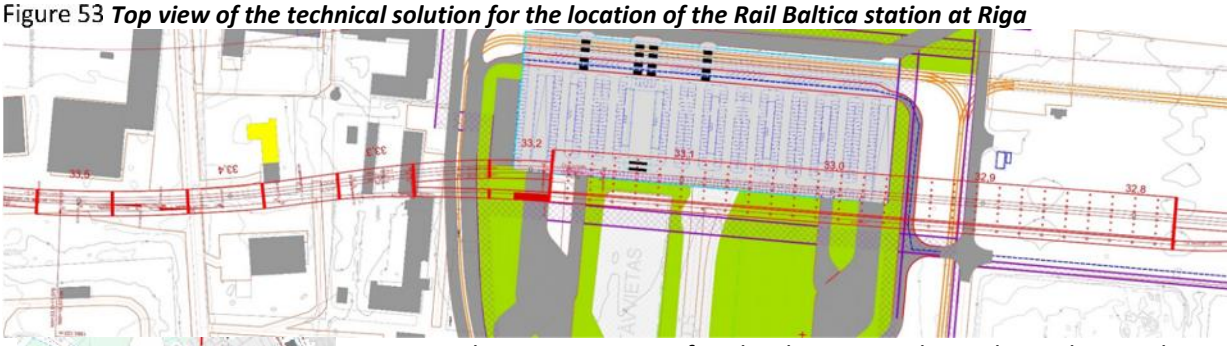
Considering that the airport cargo processing infrastructure is being developed at the northern end of the airport, one cargo railway connection is planned from Rail Baltica to this territory, which diverts away from the main line prior to the railway passenger terminal building, thus ensuring that the airport railway cargoes will be shipped on a separate track.

Considering the fact that the Rail Baltica railway will be placed on a +1 level in the territory of Riga International Airport, it is not necessary to perform any critical reconstruction or relocation of the existing airport infrastructure, and there will be no significant impact on the envisaged airport infrastructure developments. However, impact is forecast for the buildings located on the way of the

[5] in accordance with the EIA report by State JSC “Starptautiskā lidosta “Riga”“/Riga International Airport on infrastructure development projects by 2020
http://www.Riga-airport.com/uploads/files/IVN_zinojums_Rigas_lidosta_25_Septembris_2015.pdf

railway line – Baltic Cargo Centre Ltd., buildings of State JSC “Latvijas Gaisa satiksme”, and a fuel station.

Figure 53 ***Top view of the technical solution for the location of the Rail Baltica station at Riga***



During the construction of Rail Baltica, it is planned to relocate the functions of the affected buildings to a new location, for which agreement has been given by the owners of the respective buildings and infrastructure.

At Riga Central Railway Station, the railway solutions of Rail Baltica aim at merging two existing cargo 1 520 mm gauge tracks in one, rearranging the passenger platforms, and relocating all other 1 520 mm gauge tracks in order to make room for the insertion of the Rail Baltica tracks and passenger service infrastructure.

Rail Baltica station will be located on the southern side of Riga Central Railway Station. Due to the restricted space, a more than 420 m long platform is planned between both Rail Baltica tracks, which will serve standard-length (220 m) and coupled-up (400 m) international passenger trains, shuttle trains running to Riga International Airport, and, in the future, also the regional and local traffic passenger trains (Figure 54).

The Rail Baltica construction at Riga Central Railway Station will start from the switch sets before Satekles/ Ģertrūdes Street and ends at the switch sets before Krasta Street, which will allow for the train movement in the station from one track to another. On the eastern side of Riga Central Railway Station, the single track of the Rail Baltica railway ends next to the Lāčplēša Street crossing (the single rail track is located in the section from Vagonu Parks to the Lāčplēša Street crossing).

Figure 54 ***Conceptual layout of tracks in Riga Central Railway Station***

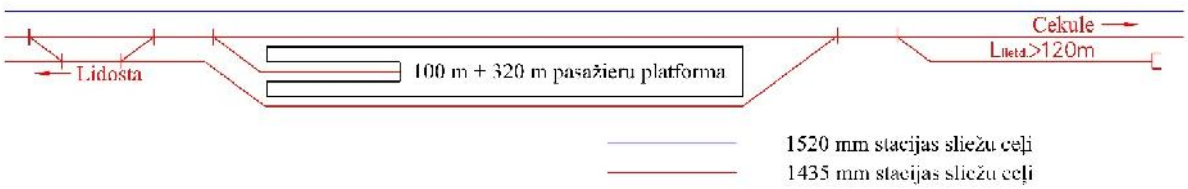


Figure 55 ***Rail Baltica and 1520 mm railway track layout in Riga Central Railway Station***

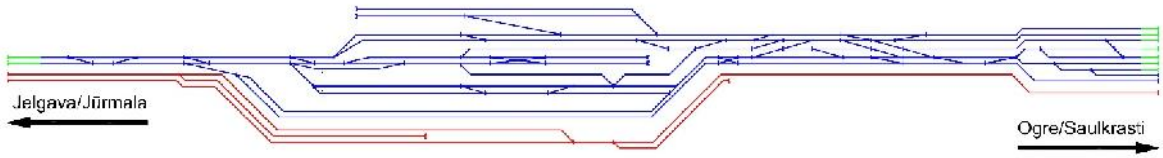


Figure 56 ***Top view of the technical solution of the location of Rail Baltica in Riga Central Railway Station***

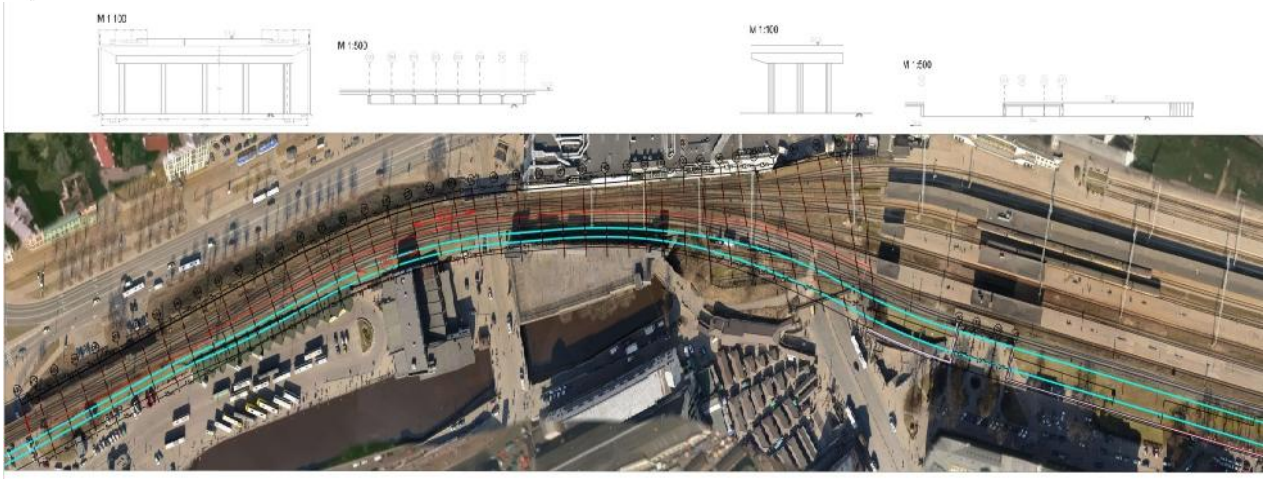


Figure 57 ***Rail Baltica railway in Riga Central Railway Station***

In parallel to the Rail Baltica Detailed technical study, the Ministry of Transport assigned Study No.SM 2015/01 TEN-T “Integration of Rail Baltica railway line within Riga Central Multimodal Public Transportation Hub – development of the technical solution”, which aims at the elaboration of the optimum technical and urban construction solution for the Riga central multi-modal public transport hub by the provision of the integration of two railway systems (1 435 mm and 1 520 mm gauge), public transport and individual mobility within a single transport hub. The envisaged solution in the Rail Baltica EIA report included the maximum widening of the existing railway embankment. Considering the solutions provided in the above-mentioned Study by AECOM Ltd., it was agreed to include the reduction of the existing rail tracks and a different location for the Rail Baltica rail tracks and passenger platforms at Riga Central Railway Station (see Figure 54, Figure 55, Figure 56, Figure 57).

Visualisations for the technical solutions have been prepared, and calculations of the construction costs have been performed.

7. COST-BENEFIT ANALYSIS AND SOCIO-ECONOMIC IMPACT ASSESSMENT

The aim of the cost-benefit analysis (CBA) of the Project Rail Baltica was to assess the possibility and scope of fund-raising from the Connecting Europe Facility (CEF) and other financial instruments. Several financing sources were considered, along with the co-financing intensity levels of several EU funds.

In accordance with Article 101 of the Council Regulation (EC) No.1303/2013, projects exceeding investment of EUR 50 million are evaluated based on a cost-benefit analysis. CBA was elaborated considering the guidelines of the EU regarding the cost-benefit economic analysis published in 2014[6]. The CBA of Rail Baltica was carried out in accordance with the incremental cost/benefit principles (incremental income and costs were calculated against the alternative without the project). A comparison of the income and expenditures from the economic activity, investment cost difference, and the difference of socio-economic benefits was performed for each of the options. CBA was carried out for the construction of the railway line connecting with Riga Central Railway Station, considering the existing passenger intensity by transport modes (air, rail, road) and changes thereof after the Rail Baltica railway line is completed, and the general impact of the new railway line on the airport operation.

Underlying to the cost-benefit analysis were the cargo and passenger flow forecasts[7] elaborated within the Feasibility study, assumptions regarding the costs of economic activity, financing, investments, and other assumptions. In the elaboration of the forecasts and assumptions, publicly available information, information collated from expert interviews, as well as the solutions presented by studies on Riga Central Railway Station and the Salaspils multi-modal cargo terminal were considered.

Based on the assumptions, the full cost and income forecast for the life-cycle of the Project (30 years from the first year of operation), and the net socio-economic benefits were elaborated. Finally, the net socio-economic and net cash flows of the infrastructure manager were determined, which were then used to elaborate the analysis indicators and further analysis.

To establish the most optimum and efficient scenario for the Project implementation and financing, an analysis of the optional Project implementation alternatives was carried out by means of the Incremental method, within which the Project's financial and socio-economic indicators were calculated considering the difference between the situation “with Project” and “without Project” (Base scenario), aiming to analyse the added cost and income value of the Project. In the case all alternatives demonstrated a negative financial net added value, the alternative deemed the best is the one having the highest positive economic added value.

- **Alternative without the Project.** Interviews from June to September 2015 with industry experts, enterprises, and association representatives established that some of the investments of the Base scenario will either be implemented by the time the Project enters into operation, or are not directly related to diverting cargo flow to the new railway line. Moreover, partial shift of cargoes from roads to rail would not decrease the necessary investments in roads. Thus the alternative without the Project assumed that the only investments in infrastructure, the realisation of which

[6] Guide to Cost-Benefit Analysis of Investment Projects, EK, December 2014 http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/cba_guide.pdf

[7] AECOM 2011 Study; http://www.sam.gov.lv/images/modules/items/PDF/item_3195_Rail_Baltica_Final_Report_Executive_Summary_31_05_11_FINAL_v2.pdf

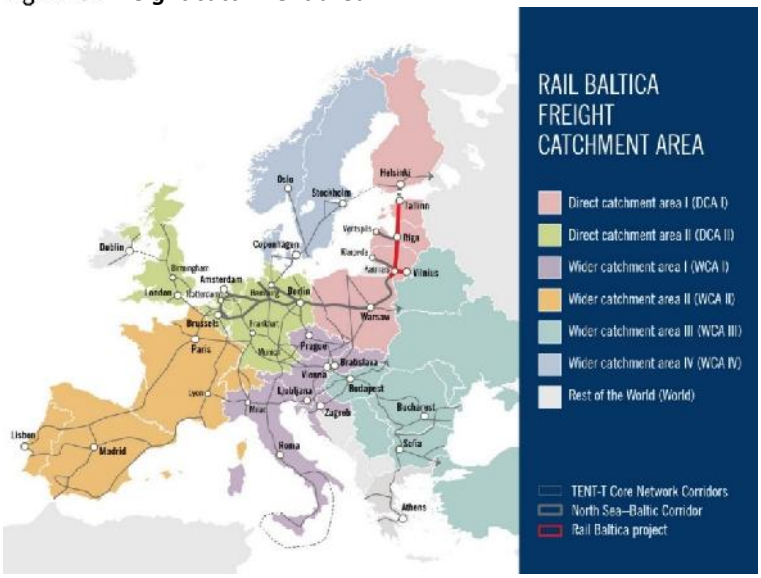
is replaced by the Project, is the construction of the 1 520 mm connection between Riga city centre and Riga International Airport.

- **Project alternatives.** Initially a multi-criteria analysis was carried out, considering several Project alternatives, including do-minimum, do-optimum, and do-maximum scenarios. As a result of the analysis six Project alternatives were selected and approved by the Ministry of Transport; these alternatives were further analysed within the environmental impact assessment study, as well as used in the interim CBA.

The Study updated the traffic model results from the Feasibility study, considering the recent development (economy, population numbers, shipment industry, global trends, etc.), and a traffic forecast model was elaborated in Excel. The traffic forecasts of AECOM Ltd. (Main scenario) were revised respectively, and considered as the main scenario of the passenger and cargo forecasts of this Study. In the course of the Study, the model results were synchronised with the Salaspils multi-modal cargo terminal and Riga Central Railway Station modelling results.

Cargo flow forecast methodology. To determine the catchment area, the corridor approach of the EU TEN-T policy was applied. To collate and analyse the data, model and forecast cargo flow, trade flows between Latvia and the origin-destination countries were divided in several sub-groups. It was assumed that the majority of the cargoes shifted to Rail Baltica would come from the existing road shipments (Figure 58).

Figure 58 ***Freight catchment area***



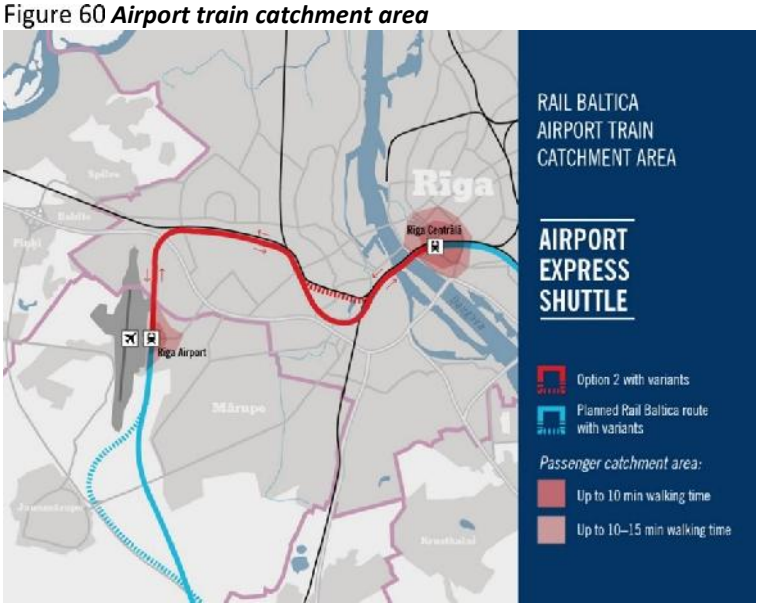
Passenger flow forecast methodology. The catchment area and the level of impact thereof, as well as the demand for the Rail Baltica passenger transport services depend on several factors, incl. the accessibility of stations, local and regional public transport, journey time and costs, habits of the inhabitants, etc. It was assumed that the major part of the passengers would shift away from using car and bus transport services (Figure 59).

Figure 59 ***Passenger catchment area***

Passenger flow forecasts methodology for the airport connection. It was assumed that the passengers of the shuttle train Riga-Airport would be

international passengers, having arrived to Riga and disembarked at Riga Central Railway Station, along with the local inhabitants living in the Riga and Mārupe municipalities of the express train catchment area (Figure 60).

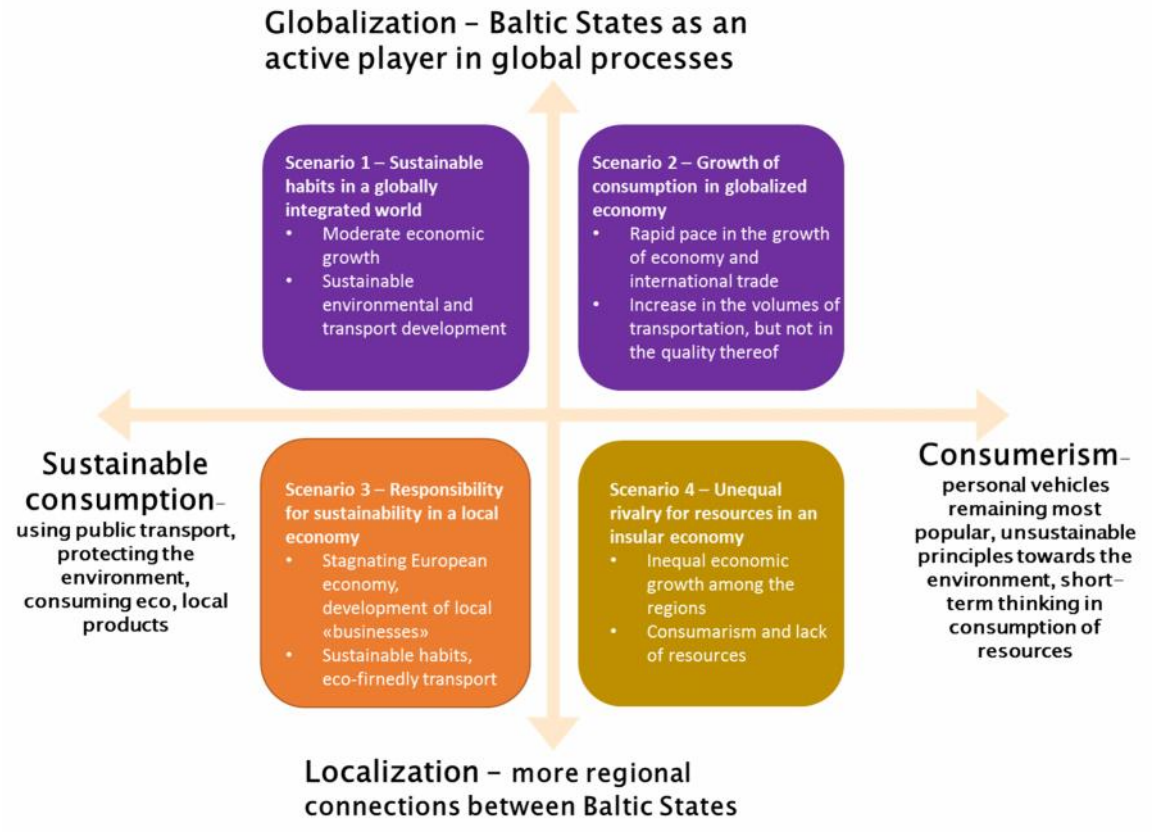
Figure 60 ***Airport train catchment area***



Considering the level of complexity of the Rail Baltica project, the impact of the various factors and trends of the Rail Baltica passenger and cargo traffic, as well as the inter-relation of these factors and trends was expressed in the form of assumptions, following consultations with experts representing a wide range of industries. As a result of that, four macroeconomic development (market) scenarios were elaborated.

Two groups (or trends) of factors, deemed significant for the railway development in the Baltic States, and forming the so-called extremes of political, economic, environmental and social development, **were underlying to the future scenarios** (Figure 61).

Figure 61 ***Structure of the macroeconomic scenarios***



The passenger and cargo flow forecasts would be the highest in the modelling if Scenario 1 and 2 were implemented, which signifies an active involvement of the Baltic States in the global processes (Table 5).

Table 5 ***Summary of the forecast cargo and passenger flows by 2050***

Scenario/ type	2015	2020	2025	2030	2035	2040	2045	2050
Cargo, million tons								
Basic scenario (AECOM)	6.88	7.76	8.98	10.42	12.25	14.56	17.11	20.12
Scenario 1	6.88	7.78	9.12	10.77	13.06	16.19	19.71	24.00
Scenario 2	6.88	7.83	9.30	11.16	13.66	16.99	20.73	25.29
Scenario 3	6.88	7.76	8.98	10.41	12.26	14.65	17.29	20.41
Scenario 4	6.88	7.72	8.78	9.92	11.21	12.67	14.26	16.05
Passengers, million PAX								
Basic scenario (AECOM)	2.12	2.41	2.73	3.06	3.44	3.89	4.39	4.94
Scenario 1	2.12	2.43	2.87	3.38	4.07	4.99	6.00	7.21
Scenario 2	2.12	2.45	2.87	3.34	3.90	4.59	5.33	6.18
Scenario 3	2.12	2.40	2.67	2.92	3.21	3.54	3.89	4.27
Scenario 4	2.12	2.38	2.59	2.76	2.89	2.99	3.09	3.20
Airport shuttle, million PAX								
Basic scenario (AECOM)	2.22	2.42	2.88	3.27	3.65	4.05	4.47	4.94
Scenario 1	2.22	2.43	2.97	3.45	3.96	4.54	5.15	5.86
Scenario 2	2.22	2.43	2.78	3.21	3.63	4.09	4.57	5.11
Scenario 3	2.22	2.42	2.68	3.01	3.34	3.69	4.06	4.47
Scenario 4	2.22	2.41	2.64	2.92	3.17	3.43	3.71	4.01

The financial indicator analysis of the infrastructure manager and the consolidated financial indicator analysis (both for cargo and passenger operators) was carried out within CBA. It was used for the forecast model to determine the cash flows of the Project. It was estimated that until 2037 the infrastructure manager will operate with minor losses.

Figure 62 ***Income and expenditure forecasts by infrastructure managers***

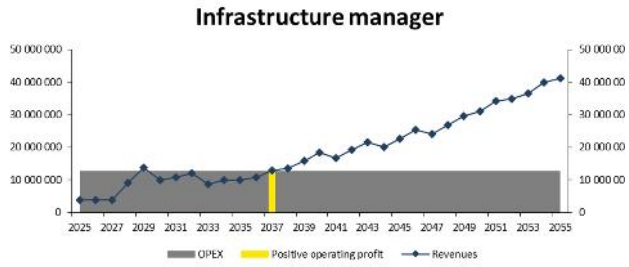


Figure 63 ***Income and expenditure forecasts by cargo carriers***

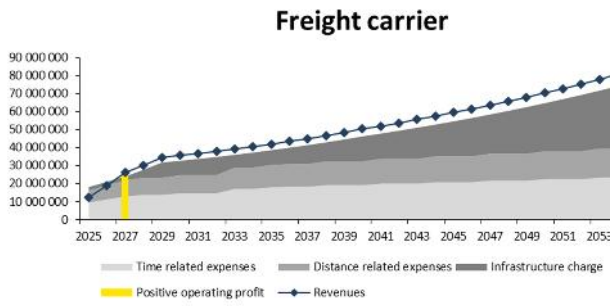


Figure 64 ***Income and expenditure forecasts by passenger carriers***

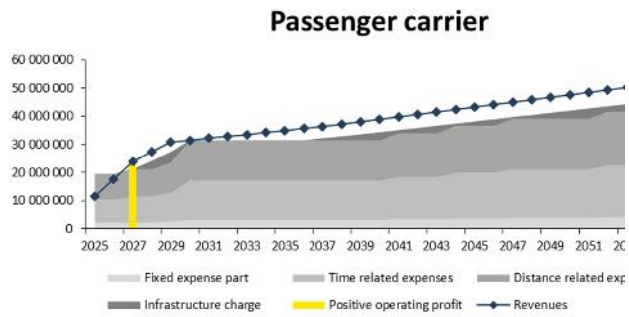
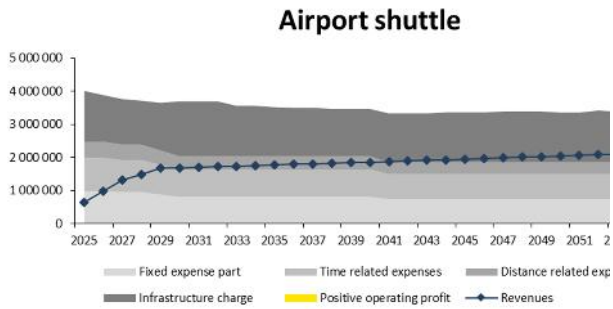


Figure 65 ***Income and expenditure forecasts by the shuttle train Airport-Riga city centre***



According to the financial analysis, the **Rail Baltica project is not financially profitable without the EU co-financing** any of the scenarios (the relevant profit rate is not achieved). The financial internal rate of return of the investment ranges around -2.7%, indicating the Project cannot recover all investments without any co-financing. Calculation of the economic added value of all the six project alternatives selected **the second alternative** as the most profitable **with the highest added value**.

Table 6 ***Indicators of the financial analysis of CBA***

Indicator	Project alternatives IIA 2
Financial net present value of the investment (FNPVc), million EUR	-1 222
Financial internal rate of return of the investment (FRRc)	-1,88%
Financial net present value of the capital (FNPVk), million EUR	-315
Financial internal rate of return on the capital (FRRk)	1,81%

Table 7 ***Cost-benefit analysis of economic analysis indicators*** [8]

Indicator, EUR	Project alternatives IIA 2
Economic net present value (ENPV), EUR	761 171 155
Economic value of return (ERR)	8,77%
Cost-benefit ratio (B/C)	1,53

To analyse the project's financial sustainability, financial sustainability analysis has been done for the second alternative. (Table 8.)

Table 8 ***Financial sustainability of the 2nd alternative***

Year	Income	Expenses	Annual cash flow	Cash flow totals	Subsidy	Cash flow through subsidies
2015	0	0	0	-	-	-
2020	244 164 269	244 164 269	0	0	-	-
2025	224 765 162	233 708 121	-8 942 959	1 370 189	10 836 762	1 893 803
2030	15 601 773	12 775 655	2 826 118	12 515 439	-	2 826 118
2035	20 205 498	12 775 655	7 429 843	33 702 839	-	7 429 843
2040	31 002 732	12 775 655	18 227 077	85 251 510	-	18 227 077
2045	37 174 940	12 775 655	24 399 285	167 636 332	-	24 399 285
2050	47 648 694	12 775 655	34 873 039	57 998 492	-	34 873 039
2055	59 614 984	12 775 655	46 839 329	225 343 629	-	46 839 329

Within the CBA of the Project the risk and sensitivity analysis has been done to several assumptions and factors of the Project. In the result of the analyse two key critical variables with the most impact on the Project: investment volume and freight rate.

[8] Calculation of MCA options approved for further technical elaboration and EIA

During the determination of the probability and scope of fund-raising from the Connecting Europe Facility (CEF) and other financial instruments, the deficit analysis of the Project funds was carried out.

Table 9 ***Economic calculation of the deficit financing rate for the option 2***

Key parameters	Non-discounted value	Discounted value	Unit
Reference period	40	40	years
Nominal financial discount rate	4,00%	4,00%	%
Total sum of investment costs for the eligible activities	1 968 900 467		EUR
Total sum of investment costs for the eligible activities		1 464 554 796	EUR
Total sum of eligible investment costs	1 968 900 467		EUR
Total sum of eligible investment costs		1 464 554 796	EUR
Residual value	852 049 214		EUR
Residual value		170 646 651	EUR
Income		295 362 094	EUR
Operation costs		223 678 757	EUR
Net income		242 329 988	EUR
Eligible costs*		1 222 224 808	EUR
Deficit financing rate		83,45%	%

* Eligible costs are given without value-added tax (VAT), assuming the VAT is non-eligible. At various infrastructure management scenarios the assumption can change and in this case additional financing of 21% of the total investment has to be taken in account.

Project priority investments are investments necessary for reaching main Project's goal – high-speed traffic for international passenger and cargo. (Table 10.- Table 12.)

Table 10 ***Project priority investments in the 1st stage of the Rail Baltica project***

Cost position	Total, thousands, EUR	2016	2017	2018	2019	2020	2021	2022	2023	2024
CEF1 - Technical projects and studies	**29 655**	2 821	9 014	16 369	725	325	200	200		
CEF1 - Land expropriation	**15 764**		1 000	4 000	7 000	3 764				
CEF1 - Construction	**234 250**			11 713	35 138	46 850	70 275	70 275		
CEF1 - Construction of route (reconstruction)	**11 970**				1 796	2 394	3 591	3 591		
Total	**291 639**	**2 821**	**10 014**	**32 680**	**44 658**	**53 333**	**74 066**	**74 066**		

Table 11 ***Project priority investments in other stages of the Rail Baltica Project***

Cost position	Total, thousands, EUR	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Construction of route (reconstruction))	**233 640**	69	832	268	220	13 063	27 150	58 800	56 127	51 728	25 381
Construction of route	**274 163**	1 126	13 510	10 031	437	6 819	19 975	57 070	70 174	63 683	31 338
Crossings with railway and relevant construction	**277 841**	50	600	105	5 634	44 499	58 315	74 612	41 792	35 813	16 422
Engineering structures and buildings	**451 291**	4 936	59 231	53 978	35 103	43 494	47 604	64 142	57 670	53 883	31 249
Reconstruction of communication networks	**263 847**	0	0	0	0	7 058	28 231	46 146	60 804	60 804	60 804
Land expropriation	**35 000**	198	4 714	7 981	10 384	5 834	5 602	288	0	0	0
Technical projects and studies	**81 980**	341	1 557	6 255	33 504	22 540	14 275	3 508	0	0	0
Barriers against noise	**59 500**	263	3 152	2 756	1 937	5 558	7 895	12 704	10 695	9 669	4 872
Total	**1 677 261**	**6 983**	**83 596**	**81 374**	**87 219**	**148 865**	**209 046**	**317 270**	**297 262**	**275 579**	**170 067**

Table 12 ***Total Rail Baltica Project priority investments***

investment financing	Part, %	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
national co-financing	**29%**	2 850	27 207	33 149	38 329	58 768	82 285	113 739	86 397	80 095	49 429
European funds for financing	**71%**	6 955	66 403	80 905	93 548	143 431	200 827	277 597	210 865	195 484	120 638
Total, thousands, EUR	**1 968 900**	9 804	93 611	114 054	131 877	202 198	283 112	391 336	297 262	275 579	170 067

Long-term investment program shows the measures needed **to** enhance the functionality of the railway line twenty years after the railway line commissioning:

- Regional traffic stations in major cities and towns around the Rail Baltica line (about 3 mln. EUR for points);
- Regional multimodal cargo processing terminal (investments made more precise specific during the research of the terminal);
- Railway station in Riga administrative territory, especially between the Riga Central Railway Station and the International Airport "Riga";
- Rail Baltica route link along the Daugava River left bank o be realized simultaneously with 1520mm gauge Riga Circle project (1435mm width single track line, investments made more precise specific during the research of the specific study);
- In addition, it has to be assessed 1520mm gauge infrastructure capacity and speed increase to Ventspils, Jelgava, Liepaja, Daugavpils, Rezekne, Valmiera, providing convenient access to the Rail Baltica in the Latvian territory (investment made more precise during the research).

The potential project investment scope was split into three stages. It was assumed that the project is funded from at least two sources: the EU co-financing and national co-financing.

Table 13 ***85% co-financing***

Part of the Rail Baltica in LV territory	Source of funding				
	CEF I&II&III	EU co-financing after2020	Credit, Bonds	Private funds (including PPP)	National
I Central part	252 544 070	534 923 903	0	0	277 529 495
II Southern part (Baldone - LT/LV border)	0	140 254 318	0	0	57 466 191
III ZIEMEĻU POSMS (Upeslejas - LV/EE border)	974 760	393 039 371	0	0	161 264 670
Other costs	20 307 500	89 310 594	0	0	41 285 595
Total, EUR	**273 826 330**	**1 157 528 187**	**0**	**0**	**537 545 951**

Table 14 ***40% co-financing***

Part of the Rail Baltica in LV territory	Source of funding				
	CEF I&II&III	EU co-financing after2020	Credit, Bonds	Private funds (including PPP)	National
I Central part	252 544 070	251 728 896	0	0	560 724 503
II Southern part (Baldone - LT/LV border)	0	66 002 032	0	0	131 718 477
III ZIEMEĻU POSMS (Upeslejas - LV/EE border)	974 760	184 959 704	0	0	369 344 337
Other costs	20 307 500	42 028 515	0	0	88 567 674
Total, EUR	**273 826 330**	**544 719 147**	**0**	**0**	**1 150 354 991**

A forecast model (in *.xlsx format) was elaborated within CBA. The electronic model was transferred to the Contracting Authority for independent use during further works within the Project, and the users were instructed on site.

Table 15 ***Elements included in the model for the calculation of the financing of Rail Baltica***

Element	Assumption/ explanation
Macroeconomic assumptions	The assumptions issued by the Ministry of Finance were used in the model
Market development scenarios	An option to view the result of the analysis by selecting any of the 4 developed scenarios was provided
Forecast revenue	The income and expenditure forecast by operators was elaborated based on the modelling results of the passenger and cargo flows
Deficit financing rate and contribution by the EU funds	The model calculated the deficit financing rate, which lead to the scope of the EU co-financing
Calculation of the financial statements of the infrastructure manager	The model calculated the profit and loss and the balance sheet of the infrastructure manager, as well as determining the cash flow for each year
Financial parameters of the infrastructure manager	The model calculated standard financial parameters of the infrastructure manager, such as EBITDA, along with the financial parameters of the project, such as FNPV, FIRR, etc.)
Calculation of the infrastructure charge	In accordance with Article 32(1) of the European parliament and Council Directive 2012/34/EU, the scope of the income was calculated consistently with the principle "what the market can pay" or how much the market situation can allow, which is based on the residual cash flow of the transport companies after covering their operation costs and return. The minimum infrastructure charge is set to 20% of the total operational costs of the passenger and cargo operators.
Wear and tear of fixed assets	The wear and tear of the fixed assets of the infrastructure managers was calculated within CBA. It was assumed that the section of the route to be renewed wears out over a period of 25 years in accordance with the linear method.
Value Added Tax	CBA has been prepared with the assumption that the project implementation is arranged in a way that enables VAT recovery, thus in accordance with the European Commission guidelines, VAT is not calculated within CBA.
Project implementation schedule	The investment cost assumptions in the model are made by 2025.
Project financing assumptions	The model assumes the project is funded from the EU, and the residual part is funded by the state.
Risk and sensitivity test	A sensitivity test on several financial and economic factors was carried out with the goal of determining the key project implementation risks

Considering all the other parallel tasks, the direct construction costs of the project were assessed on the basis of the EU legislative acts and guidelines for the CEF financed projects (Council Regulation (EU) 1315/2013 and Council Regulation (EU) 1316/2013) and the directly applicable costs of the Project were calculated.

With regards to the eligible project costs, the costs of the track interchange sites, which might be used for regional traffic in the future, and the route alignment for the future construction of the regional cargo transport infrastructure was taken into consideration.

Table 16 ***Total investment costs of the Rail Baltica project***

Position	Total, in thousands of EUR
Construction of route (reconstruction)	245 610 000
Construction of route	508 412 615
Technical projects and studies	111 635 263
Crossings with railway and relevant construction	277 841 017
Crossings with other infrastructure	451 290 572
Reconstruction of communication networks	263 847 000
Land expropriation	50 764 000
Barriers against noise	59 500 000
Total	**1 968 900 467**

The project will create several **socio-economic benefits**, such as passenger time savings, smaller impact on the environment and other benefits to the economy.

The potential price of transport and the amount of passengers shifted away from other transport modes was estimated within CBA. As a result of that, the traffic intensity reduction on roads was calculated for the respective year in comparison with the situation without the Project. It was estimated that the total reduction of the traffic intensity would exceed one million journeys of cars and 500 journeys of heavy goods vehicles per respective year.

In the Detailed technical study, changes in the habits and mobility of inhabitants (due to the implementation of the Project) were determined, leading to a reduction in the demand for bus, car, and air transport.

A qualitative assessment of the impact of the Project on the real estate value in the area affected by the Project was made. Moreover, the overall amount of investment was subdivided into domestic and foreign investment. The total impact on GDP is estimated above 450 million Euro.

A qualitative assessment of the impact of the Rail Baltica implementation on the largest Latvian ports was carried out. Moreover, the impact of the Project on the employment was analysed, and consequently the direct and indirect jobs created due to the implementation of the Project were identified.

The socio-economic assessment of the Project lead to an analytical report about the issues of importance for the general society, which was later used in the public discussions. Monetary values in EUR of the socio-economic benefits are presented in the table below (Table 17).

Table 17 ***Monetary values of the socio-economic benefits***

Indicator, in thousands of EUR	Project options	
	IIA 2	Calculation methodology
Passenger time savings	323 595	The average tariff rate per minute (0,117 EUR/min. 2015.prices) * number of total saved minutes spent on the bus, car and air transport
Cargo time savings	163 199	The average tariff rate per minute (0,117 EUR/min. 2015.prices)

Indicator, in thousands of EUR	Project options	
	IIA 2	Calculation methodology
		* number of total saved minutes spent on cargo transport.
Safety	12 277	The savings of the potential costs of fatalities from air, car and bus, with assumption that average cost of fatality is 500 083 EUR
Climate change	230 957	The benefit of reduced number of the buses, planes, cars and trucks on roads
Air pollution	310 153	The benefit of reduced number of the buses, planes, cars and trucks on roads
Impact on GDP	447 809	Direct, indirect and induced effects on GDP from locally implemented investments
Fiscal impact	18 626	Revenue from PIT created by new jobs (an average of 2 196 EUR between jobs).
Benefits/ losses to entrepreneurship	161 283	Revenue arising from the tourism sector induced passenger flow, as well as the International Airport "Riga" induced passenger traffic and retail revenue.
Benefits/ losses to power system users	15 831	The benefit of the electricity system users from reduced electricity infrastructure fixed costs, paid by existing users, because the new railway operator activities increase the power consumption of the overall system.
Airport effect	8 462	Indirect, induced and catalytic effect of additional airport income.
EBIT profit to operators	74 569	EBIT benefit passenger carrier and the airport shuttle (11.5% of revenues) and EBIT benefits carrier of cargo (11.5% of revenues).
Noise	88 201	The benefit of effect from the reduced noise of the bus, car, plane and truck.
Total	**1 854 962**	

The calculation of the economic value added of the Project identified the second alternative as the most feasible since it has the highest economic net value added.

In the initial years of Rail Baltica, governmental aid will be needed to support the operation of the infrastructure manager, however, the infrastructure manager will be able to cover all operational costs already in 2037 from its income generated from the economic activity, hence, the governmental aid will be short-term.

At the national level, marketing activities should be carried out to promote railway transport with the goal of a maximally fast modal shift of the potential cargoes from other transport modes to Rail Baltica. And it will also be essential to ensure the timely involvement of passenger and cargo operators to create the railway transport service as quickly as possible.

8. DRAFTING THE SCHEDULE AND ROADMAP FOR FURTHER IMPLEMENTATION

Rail Baltica in Latvia has been split into three **geographical parts** – the Central part, Northern part, and Southern part (Figure 66). The implementation of the Project will be initiated in the Central part with the length of 98 km. The Northern part is 116 km long, and the Southern part - 50 km long.

Figure 66 ***Geographical division of Rail Baltica in Latvia***

Rail Baltica in Latvia can be split into two **technical parts** – sections of the fully completed functioning railway line (Figure 67):

- Construction of a fully functional Rail Baltica railway in the section Riga Central Railway Station – Riga International Airport by the end of 2022,
- Construction of a fully functional Rail Baltica railway in the remaining part of Latvia by the end of 2025.

A fully completed functioning railway line in the section "Riga Central Railway Station – Riga International Airport" entails:
1) the construction of the Rail Baltica stations at Riga Central Railway Station and Riga International Airport, and the construction of a railway infrastructure line between both stations, incl. a rail bridge over the river Daugava;
2) the construction of the Acone passenger train maintenance facility and a railway infrastructure line between Acone and Riga Central Railway Station.

A fully completed functioning railway line in the remaining part of Latvia entails the construction of the:

- railway infrastructure line and related railway infrastructure;
- intermodal cargo terminal in Salaspils;
- technical maintenance facility in Vangaži;
- interchange points and inter track connection points in order to ensure the technical possibility for the development of the regional infrastructure and industries in the future;
- crossings of the other infrastructures (roads, pipes, etc.).

Rail Baltica in Latvia is divided in funding stages, and its implementation is dependent on the **funding flow**. The first implementation stage will be carried out in the Central part. A grant agreement between JSC "RB Rail" and the European Commission was signed on 24 November 2015 (Figure 68). The following stages will be planned as presented in Chapter 7.

Figure 67 ***Division of the Rail Baltica in Latvia in technical (fully functioning) sections***

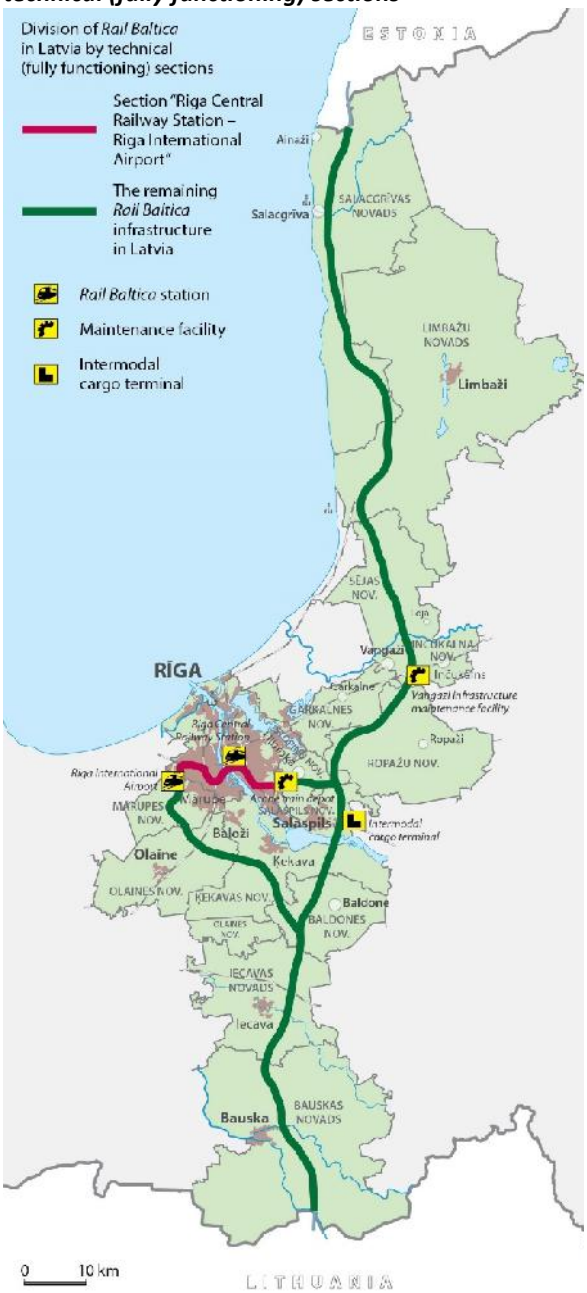
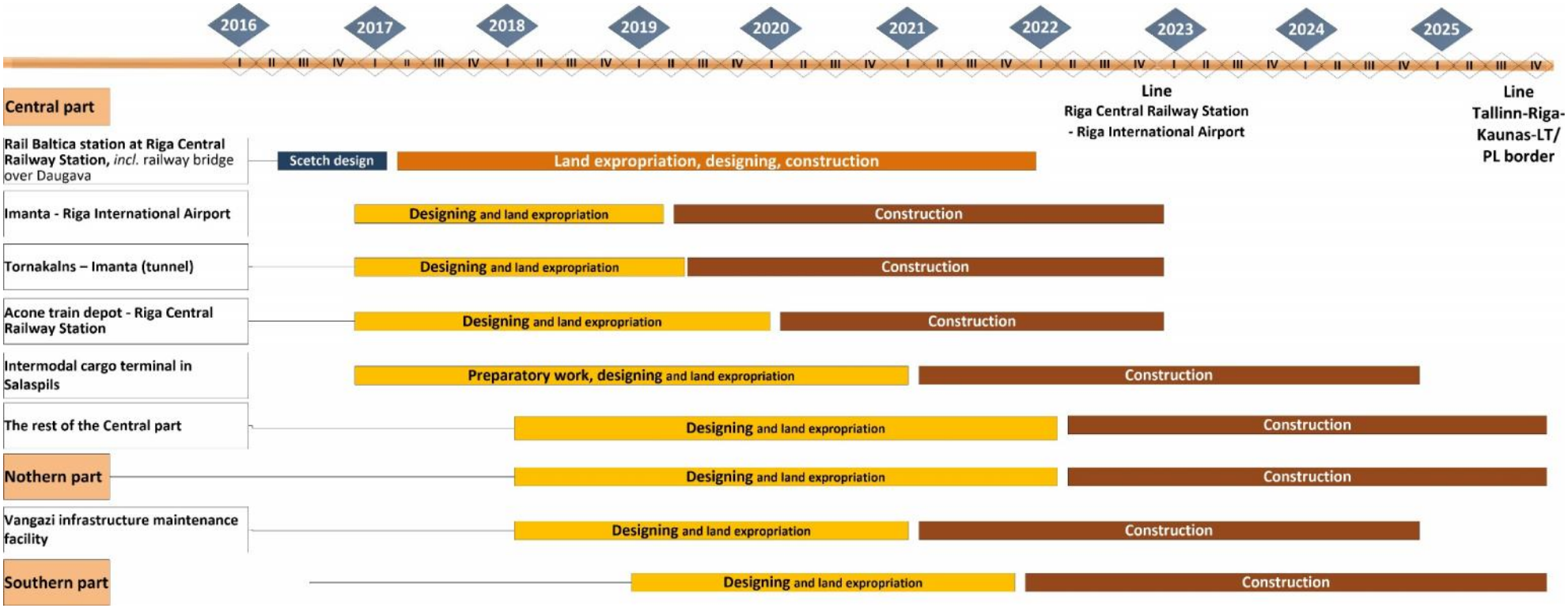


Figure 68 ***First funding stage of the Rail Baltica in Latvia***

A further action plan has been elaborated in the Detailed technical study. The plan provides recommendations for further steps of the implementation of Rail Baltica with a reference to a particular period of time for each section (procurement, design, construction project expertise, construction works, supplies, other services, international coordination, etc.), financing plan, cash flow, and cost plans (subdivided by the types of costs and funding sources). An overview of the further action plan is presented in **Kļūda! Nav atrasts atsauces avots.**Figure 69.

Figure 69 ***Recommendations for the further action plan of the Rail Baltica by geographical division and technical stages***



The first stage of the Rail Baltica project includes the designing of the whole Central part and the construction of the operating line between Riga Central Railway Station and Riga International Airport (Figure 68). All the designing and construction works have to be completed in the period 2014 – 2020, considering the n+2 principle of the EU funds (Table 18).

Table 18 ***Time schedule for the 1st stage of the implementation of Rail Baltica in Latvia***

Activity	Deadline*
Elaboration of the land acquisition plan for the Central section (Latvia)	01/07/2017
Technical design for the railway infrastructure in the Central section (Latvia)	31/12/2018
Expertise of the technical design for the railway infrastructure in the Central section (Latvia)	31/12/2018
Technical design for the Rail Baltica infrastructure in Riga Central Railway Station	31/12/2018
Technical design for the Rail Baltica infrastructure in Riga International Airport	31/12/2018
Expropriation of land in the Central section (Latvia)	31/12/2018
Construction of the Rail Baltica infrastructure in Riga Central Railway Station	31/12/2020
Construction of the Rail Baltica infrastructure in Riga International Airport	31/12/2020
Construction of the Rail Baltica railway line between Riga Central Railway Station and Riga International Airport	31/12/2020

*The deadline is indicative, considering the n+2 principle of the EU funds

Source: CEF 1 application

The land expropriation process could be initiated immediately after the Detailed technical study with announcements to the owners of the properties.

The land acquisition plan will include a description of the expropriation procedures and a plan of activities concerning land ownership (state, municipal, private, joint ownership, incomplete registration of ownership), legal status, encumbrances that could delay expropriation, and expropriation activities (the expropriation committee formed by the State, property inventories, assessment, land surveying, consultation process with land owners, contracts, etc.). The land expropriation plan will be elaborated on the basis of the recommendations and the land plot graphics for the expropriation of the properties necessary for the Rail Baltica construction, which have been prepared as a result of the Detailed technical study.

Land expropriation and calculation of the amount of restitution and compensation for loss will be ensured in accordance with the law on the real estate expropriation required for the public purposes of the Republic of Latvia.

The technical design for the railway infrastructure in the Central part includes the design of the Rail Baltica stations in Riga Central Railway Station and International Airport Riga, maintenance point – depot Acone, railway infrastructure line (94 km), two railway bridges (over the Daugava and the reservoir of Riga Hydroelectric Power Plant (Daugava)), and Intermodal cargo terminal in Salaspils. The priority is the design and land expropriation activities in the section Acone - International Airport Riga as the building works of this section need to be completed by 2022 (Figure 68, Figure 70).

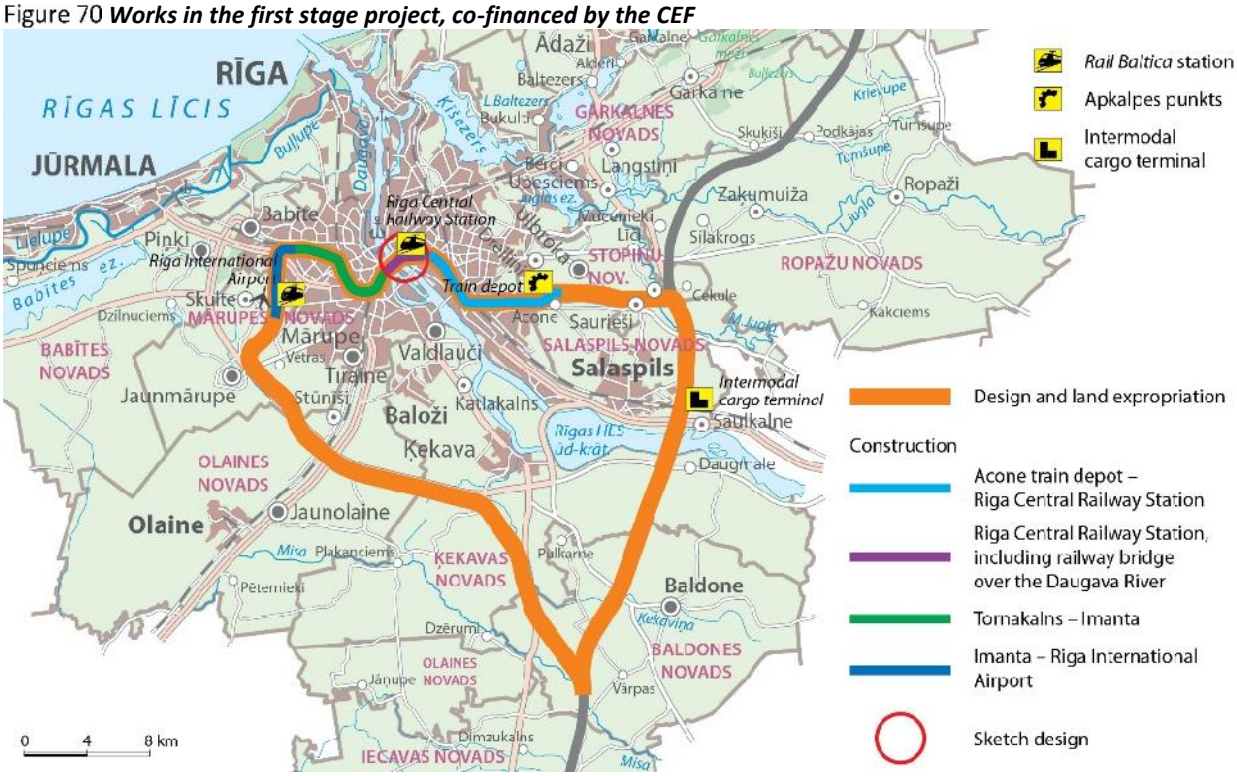
The design project will cover all engineering structures necessary for the railway functionality – rail tracks and access roads, public structures related to the railway operation, railway crossings of roads and engineering communications.

In accordance with the Latvian Law[9], construction can be initiated by the manager of the railway infrastructure, the owner of the land or buildings, or if such do not exist – the legal possessor (also the legal user of public entities, land or buildings), i.e. the user whose rights to construct are stipulated by a contract or an authorised person thereof (project manager). The Ministry of Transport is a legal possessor of the railway right of way, which constitutes a considerable part of the area planned for Rail Baltica, and the initiator of the construction will be “Eiropas dzelzceļa līnijas” Ltd. The completion of the expropriation of the remaining areas required for Rail Baltica is of critical importance, as in accordance with the Latvian Law the completion of the Technical design depends on this.

Construction in the section Acone - International Airport Riga

Construction in the section “Acone - International Airport Riga” is divided into four sub-sections (Figure 70)

Figure 70 ***Works in the first stage project, co-financed by the CEF***



The accepted route of Rail Baltica crosses the cultural monument of national importance “Historic Centre of Riga”, which is also a UNESCO heritage site. Therefore, in accordance with the Latvian Law, a design competition has been launched prior to building.

Considering the high importance of Riga Central Railway Station, the Ministry of Transport assigned a separate study in 2015 on the development of an optimum engineering and urban building solution for Riga Central Multimodal Public Transportation Hub, ensuring the integration of two railway systems, public transportation and individual mobility solutions within a single transport hub. The study was carried out by AECOM Ltd. During the study, a vision for the station and the adjoining territories was developed. Besides the Ministry of Transport, other significant stakeholders in the development of the vision were Latvian Railway and the Riga City Council (see Chapter 6, Figure 54 - Figure 57).

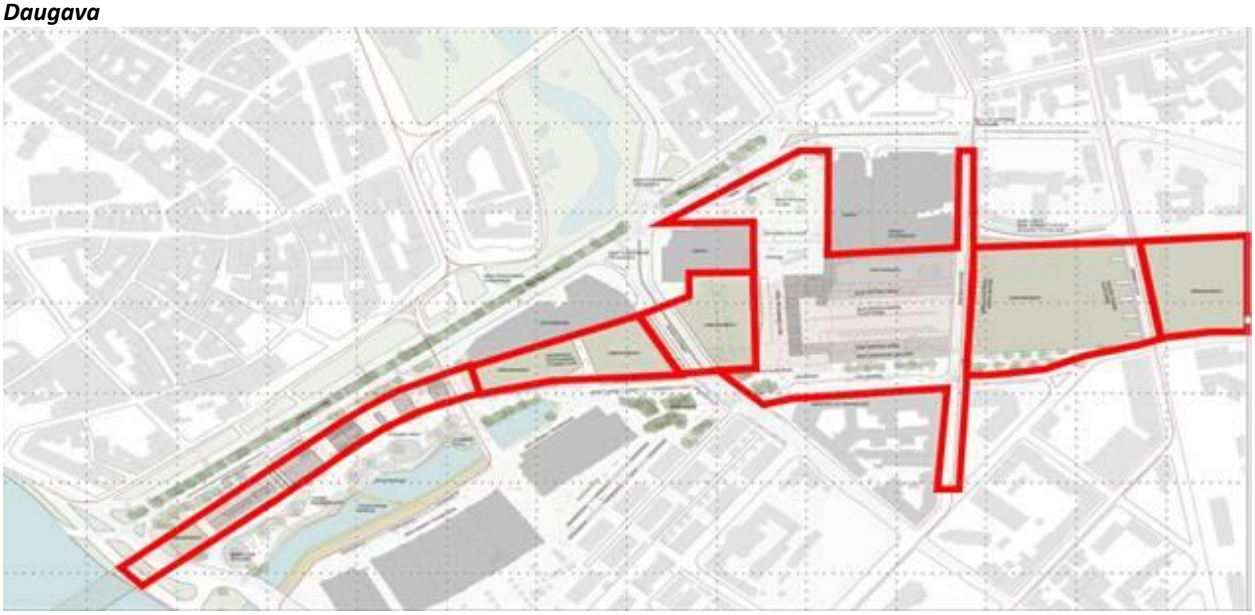
[9] Construction Law, Cabinet of Ministers Regulations No.530 “Railway construction rules” of 2 September 2014

The aim of the design competition is to promote the architecture of the new Rail Baltica station, the removal of the railway embankment, the placing of tracks on a structure, and a harmonious integration of the bridge over the Daugava into the urban environment. The results of the AECOM Ltd. elaborated vision are available for the competitors.

The development of Riga Central Railway Station as a public transport hub would be enhanced by the reconstruction of the objects mentioned in the study of AECOM Ltd. – 13.Janvāra Street, Turgeņeva Street, and other adjoining territories, the inclusion thereof depending on the involvement of the Riga municipality.

The construction of Rail Baltica in Riga Central Railway Station will be commenced in the railway right of way owned by the Ministry of Transport, involving the stakeholders during the process (Figure 71).

Figure 71 ***Rail Baltica construction area (direct costs) in the section from Riga Central Railway Station to the Daugava***



Construction

The technical solutions of the Detailed technical study allow for the preparation of the relevant documentation (technical specifications) to begin procurements.

The works will be organized in two rounds – designing and constructions works, with the exception of the section covering Riga Central Railway Station, the railway embankment and the Daugava bridge, where the designing and constructions works will be placed into a single contract. The main milestones and the involved authorities are presented in Figure 72:

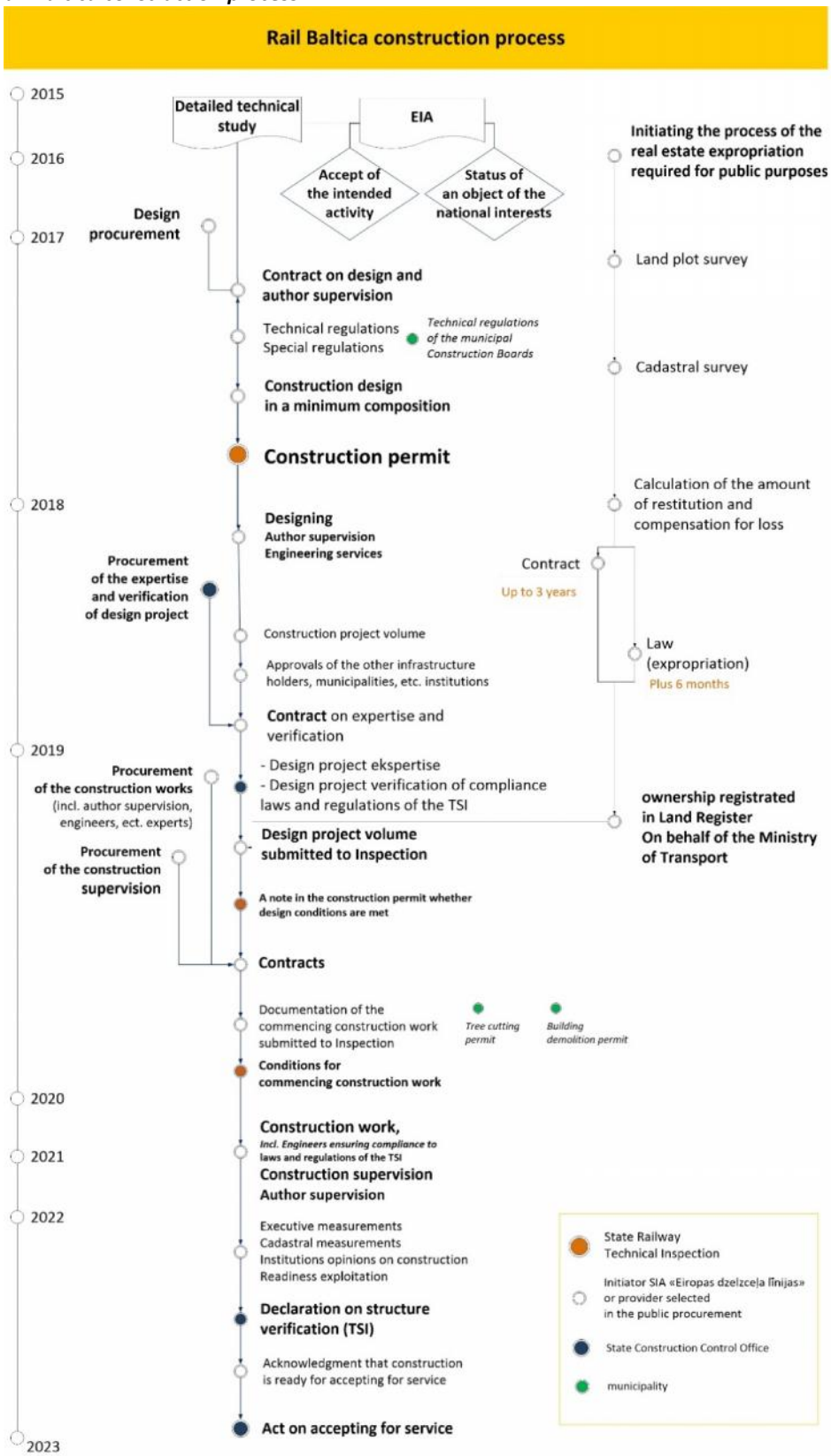
- In accordance with the Latvian Law, the building permit will be issued by the State Railway Technical Inspectorate (*hereinafter – Inspection),* based on the construction design in a minimum composition.
- Construction design in a minimum composition is part of the Contractor's contract, and will be prepared on the basis of the technical solutions of the Detailed technical study.
- The Contractor will ensure that all necessary engineers prepare the design in accordance with the ITS.
- The land expropriation process has to be completed prior to the completion of the design project, as the former is to be submitted to the design project expertise.

- The design project expertise will be provided by the State Construction Control Office (hereinafter – Office). In fact, procurement will be organized by “Eiropas dzelzceļa līnijas” Ltd., and the expertise will be taken by independent experts, incl. experts verifying against the regulations on the ITS. The expertise will include an opinion of the Notified Body – a company appointed by the Department for Transport.
- Under normal circumstances, the construction works will be prepared within three years, except for the last sub-section of each functional part which includes the signalling, telecommunication and electricity works for the total functional part, and will take up to four years to prepare. In the Riga section, these works will be provided in the sub-section “Acone – Riga Railway Central station”, and in the remainder of Latvia – in the sub-section of the Southern part.
- Author supervision services will be included in both the design and construction contracts. During the construction stage, a construction supervision will be provided.
- The act of accepting in service will be issued by the Office.

Besides the construction process of the Rail Baltica railway infrastructure (rail tracks, stations, terminals, and crossings with other infrastructure), there is the construction process of communications which are under the regulation of a special condition. For instance, the relocation of gas pipelines and the required facilities will be done in accordance with the Energy Law, Construction Law, and the design standards for gas supply systems, as well as for those exceeding the pressure of 1.6 MPa.

The boards of construction of municipalities will issue demolition permits for the buildings in the lands to be expropriated. The demolition process is under the Construction Law.

Figure 72 ***Rail Baltica construction process***



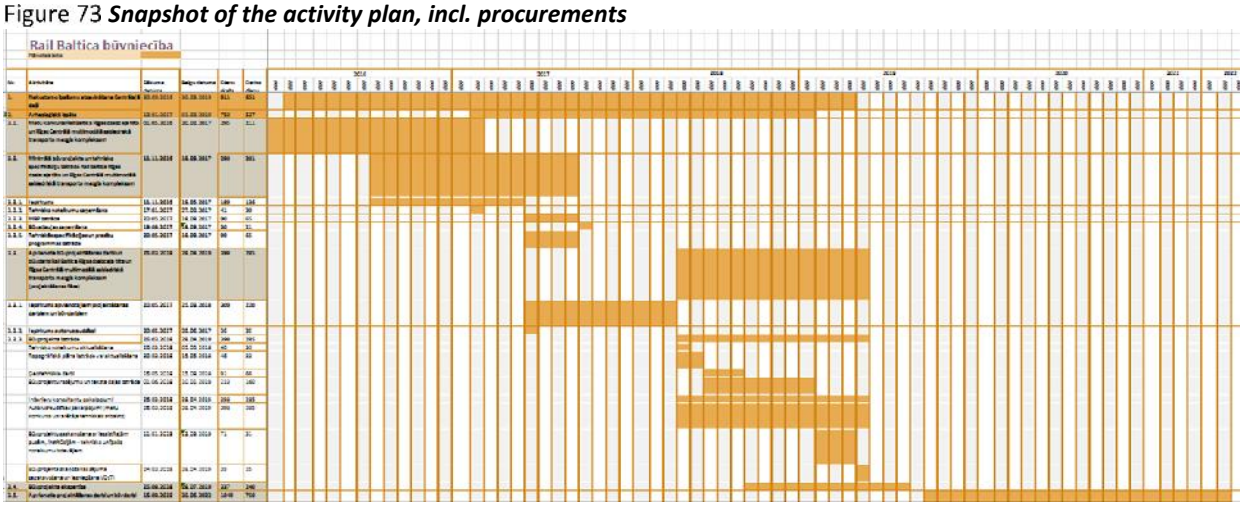
Procurements

The construction and design procurements can be merged within a single tender (e.g. the Yellow Book of the FIDIC conditions of contract), as it is recommended for the section “Rail Baltica station at Riga Central Railway Station, incl. railway bridge over Daugava”. If the construction is carried out within a merged design-build contract, the number of relevant procurements is reduced by nearly a half, and thus the risk of a delay in the project implementation is decreased (drafting procedures, complaints, etc.).

It will also be considered whether a single contract can combine various construction sections, which would significantly reduce the risks of coordinating separate contracts.

Good performance will be achieved if companies with international experience cooperate with the local companies who are more aware of the national regulations, data, public involvement, and work with the land owners in the expropriation process. For this reason, the procurement plan is rather detailed in order to ensure the coordination and scope of activities are taken at a local level (Figure 73).

Figure 73 ***Snapshot of the activity plan, incl. procurements***



Alternative financing sources

In the following Rail Baltica financing stages, other alternative financing sources besides CEF shall be considered: the EU co-funding, private co-funding, PPP**.**

The considered EU co-funding was further subdivided into these sources:

- Cohesion Fund
- Connecting Europe Facility (CEF)
- European structural and investment funds (ESIFs)
- Project Bond initiative (PBI)

The considered private co-funding was further subdivided into these sources:

- Loan by a financial institution
- Private loan/ Local bond
- Euro obligations

Alternative funding sources have been assessed in the context of the overall project funding, while the PPP was considered as an opportunity to construct several extra facilities, such as the multi-modal cargo terminal and single elements at the Riga central railway hub.

Table 19 ***Pros and cons of private funding sources***

Source of funding	Pros	Cons
Loan by a financial institution	) Lower interest expenses, since banks would require collateral and indentures regarding financial performance indicators.) No need to disclose financial information to the public.) Credit rating evaluation is not necessary, i.e. lower costs.) Loan conditions are more flexible, since it would be possible to negotiate better loan payback structure.	) Conditions for the performance indicators of the company, which may restrict the operation of the company) Linear payments – banks are interested in the reduction of risks and sooner recovery of the loan, thus the company should be able to provide the necessary income for the repayment of credit earlier than at the time of the emission of bonds, which would indicate on the repayment of debt at the end of the period.) In case of a syndicate, a simultaneous agreement with several banks would be required; this could lead to additional complications and costs.) Limited local market with a small number of banks, thus limiting the possibility of voluminous deals.
Private loan/local bond	) Faster and less expensive emission process, since the preparation and public distribution of financial information is not necessary – information would be transferred to just a handful of selected investors.) Low required income, since repayment is planned at the end of the loan period.) Assessment of the credit rating agencies is not necessary, thus costs would be reduced.) Local bonds could be adjusted to specific project needs in comparison with the standardized Eurobonds.) Fixed coupon payments, which would not change in case of interest rate changes.) Longer repayment periods available in the infrastructure sector.	) Higher interest costs in comparison with a bank loan, since the lender has less available information and lacks loan security.) Higher emission expenses in case of a small loan.) Limited number of potential investors.
Euro obligations	) More suitable for the attraction of larger financing – 200 million EUR and more.) Theoretically unlimited number of potential investors.) Low required income, since repayment is planned at the end of the loan period.	) Standardized conditions, which might conflict with the ones optimally necessary for the project.) Higher emission costs due to the determination of credit rating, costs related to the attraction of the guaranteed investors, registration costs, and other costs.) Information must be prepared for publishing.

Source of funding	Pros	Cons
	) Fixed coupon payments, which would not change in case of interest rate changes.) Longer possible repayment periods.	

During the Study, **Project implementation risks** were identified (Table 20).

Table 20 ***Project implementation risks and the recommended risk mitigation measures***

Risk categories	Mitigation measures
Technical/ operational risks:	**Mitigation measures:**
▪ Lacking an integrated agreement of the construction process between the Baltic States	) A joint venture of the three Baltic States – the joint-stock company "RB Rail" will coordinate the implementation of the European standard gauge railway project *Rail Baltica, incl. design and construction works outside Riga*
▪ Technical solutions between the Baltic States have not been coordinated	) Agreement on the technical solutions while elaborating the traffic management systems and the action plan of the Rail Baltica railway
▪ Dependency on third party decisions in the process of construction	) Holding the status of a project of national interest allows to initiate the construction process in case spatial plans are not relevant, and to proceed with the construction in case the building permit is challenged in the court
▪ Lack of competence of the construction service providers and construction experts	) Procurement procedure plan, which is drafted beforehand) EU tender procedures to attract companies and experts with international experience) Cooperation with the EU high-speed railway experts from the beginning of the design phase (Notified body)) Testing interim stages in the Project implementation, providing sound project supervision) Ensuring an independent procurement process
▪ Project management structure is not of sufficient quality	) Agreeing on the Project implementation with all stakeholders) Ensuring a Project management capacity and quality control
Financial risks:	**Mitigation measures:**
) Increase of estimated costs	) Effective use of the funds, opting for minimum cost alternatives that ensure technical compliance) Inclusion of clauses in the construction agreements that appropriately manage the cost overrun risk between the contractors) Alternative co-financing from state funds (if possible, additional borrowing)
) Cargo and passenger carriers are reluctant in using the Rail Baltica infrastructure	) Supporting the marketing activities of JSC "RB Rail" within Latvia and the other Baltic States with the goal of attracting Rail Baltica operators

Risk categories	Mitigation measures
	) Promotion of the state public transport system strategy that includes Rail Baltica as the core element (promotion of the regional passenger traffic)
) The expected co-financing is reduced (support intensity)	) Regular coordination of information regarding the available co-funding, and cooperation with stakeholders (EC, INEA, Latvian Railway, Riga City Council, etc.)
Strategic risks:	**Mitigation measures:**
) Estimated operation forecasts have not been met) Changes to macroeconomic indicators) Negative attitude by third parties and complaints about the completed Project) Impact of changes in the political forces on the Project implementation) Changes in the vision of the Project and the development direction	) Positioning the Project as an element of strategic importance on a governmental and municipal level) Revision of the Project implementation time and work schedules with the most minimal impact on the main Project results) Agreeing on the Project with all direct and indirect stakeholders on a national, Baltic states, and EU level) Initial construction of the railway sections which are functionally completed, as well as connected to the TEN-T network

Issues to be coordinated between all three Project countries account for a major part of the project implementation risks.

To ensure the implementation of Rail Baltica and to plan the activities to be included in the next funding stages, **several issues have to be coordinated between the project countries Latvia, Lithuania, and Estonia**:

- Action plan of the Rail Baltica railway line traffic management system (in 2015, the enterprise "Maivro und Railistics GmbH" Ltd. carried out a study "Study of the Rail Baltica railway line traffic management system and elaboration of an action plan" assigned by the Latvian Ministry of Transport (ID No. SM 2015/17 TEN-T);
- Update of the common technical solutions of Rail Baltica railway ("Technical principles") in accordance with the approved Common principles ("The Common Principles for the Rail Baltica 1 435 mm Railway Spatial and Territorial Planning and Preliminary Design Study");
- Common financial and operational principles of the Rail Baltica railway ("The Rail Baltica 1 435 mm railway operational plan", which is elaborated by the Estonian, Lithuanian, and Latvian ministries of transport, and which is coordinated by the joint venture of all three Baltic States – JSC "RB Rail", "Eiropas dzelzceļa līnijas" Ltd.).

9. DETAILED TECHNICAL SPECIFICATION FOR EACH ELEMENT OF THE CONSTRUCTION PROCESS

The technical specifications have been elaborated for the design of Rail Baltica and can be used for each necessary stage of the Rail Baltica railway. These specifications are based on the detailed technical solutions developed during the Study, EIA findings, conditions and recommendations by stakeholders and involved parties.

The technical specifications determine the output data and parameters necessary for the following design stages, which need to be observed in order for the construction project solutions to comply with the European standards of high-speed railway traffic, the Common principles in all three Baltic States, as well as the European guidelines for the design and construction of high-speed railway infrastructure. The most essential conditions the technical specifications contain are these:

- Compliance of the technical parameters with the technical specifications for interoperability (TSI) and the European standards (EN);
- Compliance with the Common principles elaborated by the three Baltic States;
- Compliance with the design guidelines of German railway (RIL) for high-speed railway;
- Compliance with the detailed technical solutions elaborated during the Technical study;
- Compliance with the environmental impact assessment (EIA) report and the opinion of the Bureau;
- Compliance with the technical conditions and terms by the owners of other affected infrastructure.

The detailed technical specification has been developed for each element of the construction process, for instance:

- project background,
- location of the site,
- detailed technical study and Environment Impact Assessment,
- overview of the local conditions,
- scope of works,
- railway track (including earthworks and railway subgrade, railway track technological parameters (rails, concrete sleepers and fastening material, wooden sleepers and fastening material, hollow sleepers and bearers, railway ballast, protection layer, turnouts and compensators, cabel canals, geotextile, armoured geotextile and geonet, side way)),
- another railway infrastructure (including bridges and overpasses, tunnel, retaining walls, noise reduction solutions and noise barriers, passenger platforms, service roads, rescue fields),
- another infrastructure (including roads overpasses, pedestrian over/under passing, connecting roads, green bridges, crossing of other infrastructure),
- signalling system (including system structure, ERTMS, central traffic control system, auxiliary detection system, technical buildings, control system),
- telecommunication system (including fixed telecommunication system, radio communication system (GSM-R)),
- power supply system (including general requirements of the design and construction of a power supply system, requirements for the equipment for 20 kV power supply lines, requirements for the equipment for 0,4 kV power supply lines, cables, pipes, other materials, lighting design requirements for the stations, train stops, yards, platforms and turnouts, general requirements for

turnout electrical heating, requirements for a standby diesel generator, earthing, requirements for the equipment for 750 V power supply lines, control system),

- traction substation (general requirements for the equipment, equipment for 330 KV outdoor switchyard, 330 kV equipment, equipment for 110 KV outdoor switchyard (general requirements, order specification (110 kV equipment, KAS cabinet, TAS cabinet, the box of current transformers terminals, the box of voltage transformers terminals, the box of circuit breaker terminals)), power transformers (general requirements, ordering Specification for 110/27,5 kV transformers)),
- catenary system.

Since the construction project expertise for a particular structure, such as the Rail Baltica railway, imposes mandatory construction expertise and scope thereof, the legislative requirements and conditions for carrying out the construction expertise were collated.

The Terms of Reference for the construction supervision and author supervision have been developed at the level possible before the technical project is elaborated, including the main conditions and responsibilities in the supervision process.

10. COMMUNICATION WITH STAKEHOLDERS (MUNICIPALITIES, GOVERNMENTAL AUTHORITIES AND OTHER ORGANISATIONS) AND THE SOCIETY

During the Detailed technical study of Rail Baltica, communication and the full involvement of all stakeholders (government, municipalities, their institutions, public organisations, enterprises and individuals) was ensured, and each of the stakeholder groups was addressed through the most suitable cooperation and communication channels to receive recommendations from all interested parties.

Requirements from the persons whose interests are affected by the Rail Baltica construction are included in the technical specifications (see chapter 9), which will serve as guidelines for the elaboration of the procurement documentation for the next implementation stages of Rail Baltica.

Contact information about the owners and the legal possessors of immovable properties was retrieved from public databases (governmental and municipal websites, State Land Service “Information System of State Cadastre of Immovable Properties”) and was applied considering the data protection principles of the Personal Data Protection Law.

In June 2014, the Ministry of Transport established the Rail Baltica **Technical work group**[10]; its aim was to ensure the cooperation of the infrastructure holders (authorities, governmental enterprises, and organisations) with the contractors GP “RB Latvija”, to evaluate the Study reports, to identify issues and solutions thereof, to organise the cooperation with stakeholders on a national and international level, and to provide a justified opinion to the National management group for decision-taking. The Technical work group includes representatives from ministries – the Ministry of Transport, Economy, Environmental Protection and Regional Development, and Agriculture, and representatives of their subordinate authorities and enterprises – State JSC “Latvijas Dzelzceļš”, State Railway Administration, State Railway Technical Inspectorate, State JSC “Latvijas Valsts ceļi”, JSC “Latvijas Gāze”, JSC “Latvijas Valsts meži”, State JSC “Starptautiskā lidosta “Rīga””, JSC “Rīgas starptautiskā autoosta”, Lielrīga Regional Environmental Board of State Environmental Service, Nature protection board, companies of the Latvenergo holding – JSC “Latvijas Elektriskie tīkli”, JSC “Augstsprieguma tīkls”, and JSC “Sadales tīkls”, and representatives of the Riga and Zemgale planning regions, The Latvian Association of Local and Regional Governments (LALRG), Riga City Council, and Freeport of Riga Authority. Besides the authorities involved in the Technical work group, other authorities were addressed to be able to use the data at their disposal and to clarify their opinion – State Forest Service, State Inspection for Heritage Protection, Council for Preservation and Development of the Historic Centre of Riga, UNESCO Latvian office, State Land Service, Latvian Geospatial Information Agency, Latvian Environment, Geology and Meteorology Centre, Ministry of Defence, National Armed Forces and National Guard, and Environmental State Bureau. There have been meetings with enterprises from Freeport of Riga, Environmental Advisory Council, and Association of Latvian Archaeologists, giving presentations on the status of the Project and scheduled works.

The Technical work group held meetings to discuss the Rail Baltica route alignment options, initial selection, multi-criteria analysis, and environmental impact assessment alternatives (8 meetings). For the elaboration

[10] Decree No. 01-03/111 “Regarding establishment of Rail Baltica Technical work group” of 4 June 2014 by the Ministry of Transport

and coordination of the technical solutions, more than 150 working meetings with infrastructure holders in total were organised (Table 21).

Table 21 ***Overview of the consultations with infrastructure holders and stakeholders***

Body	Key issues and technical solutions
State JSC “Latvijas Dzelzceļš”	The co-existence of the 1 520 mm gauge railway infrastructure system and the planned 1 435 mm railway infrastructure system: railway line crossings, single corridors, a multi-modal cargo terminal, the use of the land of the existing railway in the Stopiņi municipality and the city of Riga (for a length of 27 km, incl. the Acone depot, the railway crossing in Šķirotava, the connection to Riga Central Railway Station, the Daugava bridge, the Torņakalns crossing, pedestrian/ cycling crossings, barriers against noise).
State JSC “Starptautiskā lidosta “Riga””	The integration of the new 1 435 mm railway infrastructure within the airport territory in terms of the envisaged development plans, including the location within the airport territory, coordinated construction of the new terminal and the railway station, and linking the railway with the cargo carrier and logistics enterprises.
JSC “Latvijas Valsts meži”	The management of state forests split by Rail Baltica, the crossings of forest roads and other infrastructure belonging to the joint stock company. Hunting areas in state forests, recommended animal crossings in cooperation with the Latvian Hunters’ Association.
“Rīgas meži” Ltd.	The management of the Riga municipal forests split by Rail Baltica, the crossings of forest roads and other infrastructure belonging to the limited liability company. Hunting areas in Riga municipal forests.
JSC “Latvijas Elektriskie tīkli”, JSC “Augstsprieguma tīkls”	The construction of Rail Baltica and the third Estonia-Latvia power supply network interconnection (330 kV power transmission line), cooperation regarding the placing of both linear structures within a single corridor, technological solutions and solutions regarding the operation site, conceptual organisational solutions and alternatives, potential issues regarding the construction of a single corridor, the location of facilities and additionally needed territories.
State JSC “Latvijas Valsts ceļi”	The crossing of state roads, solutions for traffic organisation and access to immovable properties. In developing the Rail Baltica route alignment options, the planned road projects were taken into consideration in the places where this was in line with the railway route geometry in order to bring the infrastructure corridors closer, and to reduce the territories encumbered with protective belts, thus reducing the impact on the society and environment.
JSC “Latvijas Gāze” (incl., operational section “Inčukalns underground gas reservoir” and operational section “Gas transport”)	The overall technical requirements to cross the gas supply pipelines. The coordination of solutions for the reconstruction and relocation of the gas pipelines and appliances. Consideration of the protective belts along the gas supply pipelines, gas stations, and monitoring boreholes of the Inčukalns underground gas reservoir.

Body	Key issues and technical solutions
Knauf Ltd.	The extraction of gypsum layer in the deposit “Saulkalne” before the construction of Rail Baltica is commenced, the relocation of the main gas pipelines and appliances.
Ministry of Defence	The possible impact of Rail Baltica on the buildings and the military training area “Ādaži” of the National Armed Forces.
Ministry of Environmental Protection and Regional Development (VARAM)	The assessment of the possible impact on NATURA 2000 areas at the initial route selection, municipal planning issues regarding the integration of Rail Baltica in the spatial development planning documents.
Council for Development of Historic Centre of Riga	The Daugava crossing, the construction conditions for the new 1 435 mm gauge railway line within the Historic Centre of Riga and its protection belt.
Riga International Coach Terminal	The construction of the Rail Baltica station at Riga Central Railway Station, the cooperation with AECOM Ltd. on the development of an inter-modal passenger terminal and a public transport hub in Riga Central Railway Station.
Freeport of Riga Authority	The development of a possible connection between the 1 435 mm gauge railway line and the port territories on the right and left bank of the Daugava in Riga.
Ministry of Agriculture	The crossing, protection and preservation of state-owned water drainage systems in agricultural lands.
Rural Support Service	The possible impact on the rural farms and enterprises which have commenced the implementation of projects from EU Rural Support programmes.
State Forest Service	Protected forest habitats and other protected areas in forests, statistics of hunted animals and, in cooperation with the Hunter’s Association, forest tracks for animal migration.
JSC “Latvijas Valsts meži”, “Rīgas meži” Ltd.	The crossing of enterprise-owned forest roads and other infrastructure, recommended access solutions for the forest areas split off due to Rail Baltica.
State Environmental Service	The impact on the environment by Rail Baltica, including the nuclear waste disposal site “Radons”, polluted sites.
State Inspection for Heritage Protection	The location of Rail Baltica relative to state cultural monuments and their protective belts, further archaeology studies.
State Land Service	The involvement of State Land Service in the expropriation process of lands necessary for the construction of Rail Baltica by coordinating consolidation projects of land properties.
Municipal authorities and enterprises	The crossings of municipality-owned communications, municipal roads, and streets with Rail Baltica, the organisation of local traffic, the longer-term development opportunities of regional traffic and logistics areas due to the Rail Baltica infrastructure.

The cooperation with all stakeholder authorities was efficient, and a fast exchange of data and information, along with a pragmatic approach to solving complex issues, was ensured. The attitude of the authorities regarding the Rail Baltica project was positive in general, and solutions were found for the construction of a single infrastructure corridor and the most reasonable location of the infrastructure.

In order to involve the municipalities crossed by the public use railway infrastructure line Rail Baltica in the Detailed technical study, the Ministry of Transport established a Municipality work group in August 2014.

Besides the Municipality work group meetings (6 meetings), there were individual consultations with the municipal head managers, development and planning experts, and presentations were given at the meetings of councils and development committees to ensure municipal deputies are aware of the solutions of the Project (more than 100 consultations).

Municipalities got involved in the advisory work groups of inhabitants and ensured meetings with the inhabitants and groups of land owners for several times to explain and clarify the route alignment and possible impacts.

Due to the direct and open cooperation with the municipalities and inhabitants, compromises have been made, the various, often contradicting, local interests were taken into consideration already during EIA, and conceptual support from the local inhabitants for the implementation of the Rail Baltica project was achieved. Following the opinion of the Bureau, municipalities will express their view on the recommended alternative of Rail Baltica.

Table 22 ***Summary of the meetings and consultations organized during the Study (till 31 August 2016)***

Meetings of the National Management Group	13
Meetings of the Technical work group	8
Meetings of the Municipality work group	6
Meetings of the Project coordination work group	101
Meetings of the Latvian-Estonian-Lithuanian work group	10
Meetings and consultations of the representatives of the municipalities	102
Meetings with the initiative groups of residents and associations	26
Other juridical persons, ministries, representatives of the associated infrastructure authorities	153
EIA meetings	33
Conference	1
Participation in TEN-T Days 2015	1

In the delivery of Task 10, the Study contractors worked in close cooperation with the Ministry of Transport both in coordinating the content of the message to be communicated in the media and in preparing materials for the Ministry to be published and discussed with the stakeholders.

During the Study, a set of measures was undertaken to ensure real involvement of the society.

- Support for the **establishment of advisory work groups of inhabitants and municipalities and for the participation** in activities thereof (the Salacgrīva, Limbaži, Sēja, and Bauska municipalities), which was done in several stages of the Study (220 people were involved in total).
- Repeated **meetings with inhabitants and groups of household owners** to explain and clarify the route alignment and the possible impact (the Bauska, Iecava, Baldone, Ķekava, Mārupe, Stopiņi, Inčukalns, Garkalne, Sēja, Limbaži, and Salacgrīva municipalities, and the city of Riga), a total of 130 individual consultations on site were organised.
- The preparation of analytic and explanatory **cartographic materials** and the communication of the information to inhabitants by email regarding the materials published on the Rail Baltica website (informative emails were sent out on 1 July and 12 August 2015).
- Website www.railbaltica.info (unique visitors in 2015-2016 exceeds 100 thousand). In the time period from 26 November 2014 to 31 August 2016, 123 publications regarding the developments of the implementation of the Project were published on the website.

- An **informative phone number** 27577344 and an **informative e-mail** info@railbaltica.info to explain and clarify the route alignment and the possible impact by attaching maps of Rail Baltica and the respective immovable property. This was used by more than 1 600 individuals: more than 700 phone consultations were carried out, and detailed answers by e-mail were sent out to more than 900 people.
- **Individual messages by post**, which meet the EIA legislative requirements for initial public discussion (4 812 owners were informed, incl. 91 living abroad).
- **Publications in newspapers**, in accordance with the EIA legislative requirements, along with additional **press releases** (27 units).
- **Press conferences** attended by various mass media representatives – 5 events.
- **Interviews on the radio and television** – 7 events.
- **The International Rail Baltica conference.**

During the study and consultations, the **contact information** from the owners of private immovable properties (inhabitants and businesses) affected by Rail Baltica route options was collated (mailing address, e-mail, phone number). This allowed to expedite and ease the communication process and the conceptual agreement of solutions. Considering the laws of personal data protection, these data are not available to the wider public and have been submitted to the Ministry of Transport to be used in the process of expropriation and the determination of fair compensation.

Within the Study, a **website** (vortal) www.railbaltica.info (Figure 74) was created, which was a key and consistent communication channel providing information to the society about the Detailed technical study of Rail Baltica and the activities undertaken as part of it.

Figure 74 ***Website www.railbaltica.info***

During the whole Project, a permanent cooperation with the **Latvian media** was ensured, which has resulted in a positive attitude towards the Rail Baltica project (in the media publishing both in Latvian and Russian). This has contributed to a positive public opinion, which is demonstrated by the results of the monitoring of the public opinion.

Besides the initially planned six press releases, the coverage of the public opinion was extended with complete **media campaigns** during all of the key Study stages – the initial public discussion of the Rail Baltica EIA, the initial public discussion of the additional alternatives, the public discussion of the EIA report, the international conference, and the public discussion results. Media representatives were granted access to a large visual material and a video, thus being the first to receive information about the course of the Project.

Table 23 ***Summary of the involved media as a result of the media campaigns***

Type of media	Name of media
National newspapers	Latvijas Avīze, Dienas Bizness, Neatkarīgā Rīta Avīze, Vesti Segodnja, Diena
Regional newspapers	Rīgas Apriņķa Avīze, Staburags, Bauskas Dzīve, Auseklis
Online media	leta.lv, bns.lv, sam.gov.lv, delfi.lv, Rus.delfi.lv, Tvnet.lv, Rus.tvnet.lv, Nra.lv, Lsm.lv, La.lv, db.lv, Rus.db.lv, Diena.lv, irlv.lv, Apollo.lv, apollo.tvnet.lv, Vesti.lv, FinanceNet.lv, Ves.lv, Baltic-course.com, skaties.lv, Kasjauns.lv, bb.vesti.lv, aprinkis.lv, limbazi.pilseta24.lv, acb.lv, Bnn.lv, reitingi.lv, lat.mixnews.lv, ekonomika.lv, Focus.lv, db.lv, iecava.lv
Radio	LR1, LR2, LR4, Mix FM, Retro FM, Baltkom, Pik FM, SWH, SWH Plus, Rietumu Radio, Kurzemes Radio, Radio Tev, Skonto
Television	LTV1, LTV7, LNT, TV3, TV5, PBK, Riga TV24

In addition, the Contractor established cooperation and distributed an informative newsletter and a press release to the **municipal media**, which were in turn published in the **municipal newsletters**: Salacgrīvas Novada Ziņas, Limbažu Novada Ziņas, Sējas Novada Ziņas, Inčukalna Novada Ziņas, Ropažu Vēstis, Garkalnes Novada Vēstis, Stopiņi informative newsletter "Tēvzemīte", Salaspils Vēstis, Ķekavas Novads, Baldones ziņas, Iecavas Ziņas, Bauskas Novada Vēstis, Olaines Novada Vēstis, Mārupes Vēstis and the **websites of the municipalities**. The accomplished work with mass media has effected a positive evaluation of the Rail Baltica project in the media publishing both in Latvian and Russian, as well as a positive attitude of the inhabitants.

Clear explanatory **informative materials**, up-to-date information about the Project in general, 3D visualisations, maps and layouts of various levels of detail (e.g., the EIA route options on Google map https://www.google.com/maps/d/viewer?mid=zQ3hbi_LzRBg.kiPUrcLi7kYI), a glossary, presentations from meetings, and minutes of meetings were placed on the Rail Baltica website.

These materials were used for the communication with the society along with cartographic materials regarding the principal solutions of the key structures, lands to be expropriated, buildings to be torn down, and access to properties. See the set of materials on the website http://railbaltica.info/informacija/informacija-medijiem/.

A dynamic visualisation (video) for the Central section of Rail Baltica – the railway section from Upesciems to Baldone – was prepared during the Study. It presents the most complex section of Rail Baltica with the crossing of Škirotava, the train arrival platforms at Riga Central Railway Station and Riga International Airport, the Daugava crossing, the Torņakalns tunnel, and other complicated route sites in the city of Riga. In August 2016, a second dynamic visualisation (video) regarding the Rail Baltica track in the whole territory

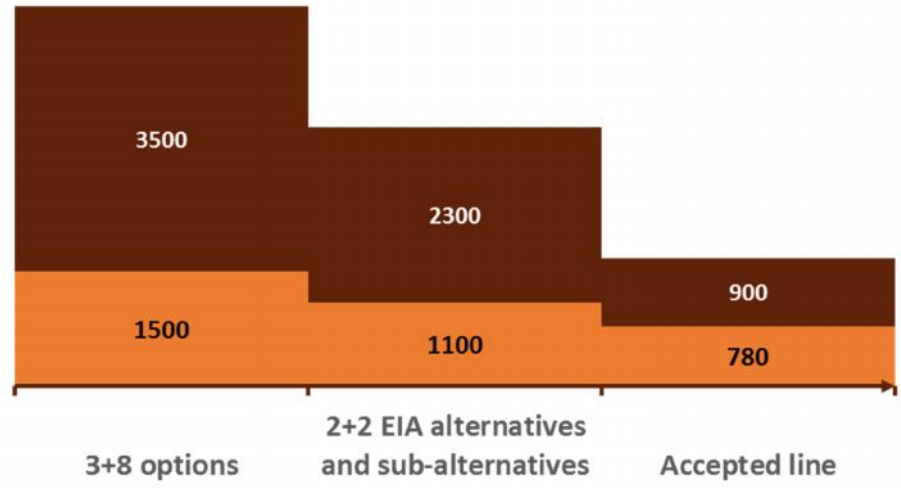
of Latvia was prepared (with the specific visualisation of crossings), which has received the development consent.

On 23 September 2015, the **international conference “Rail Baltica railway on its way”** was held at the Railway Museum (in Riga, Uzvaras blvd. 2A). The conference was attended by experts from all three Baltic States, who gave presentations regarding the planning of the route alignment, the elaboration of economic benefit appraisals, the possible compensation mechanisms to individuals, the development of Rail Baltica stations and logistics centres. At the end of the conference, a panel discussion “Topical questions for future solutions” was held.

The aim of the conference was to provide direct, objective and up-to-date information about the Project prior to commencing public discussions of the Latvian section of the EIA report. The target audience of the conference was governmental officials, municipal officials, non-governmental organisations, and advisory work groups of inhabitants. Considering the number of participants (more than 140) and the broad media coverage, it can be concluded that the aim has been achieved.

Communication process with stakeholders and the society helped to other tasks of the Detailed technical study. The most massive communication activities with the society were held in the middle of the Study during the EIA, whereas communication with municipalities started in the early stage of the Study, but infrastructure holders and other institutions has been involved constantly all the time of the Study (Figure 75).

Figure 75 ***Summarisation of the communication process by selection stages of the Rail Baltica alignment***



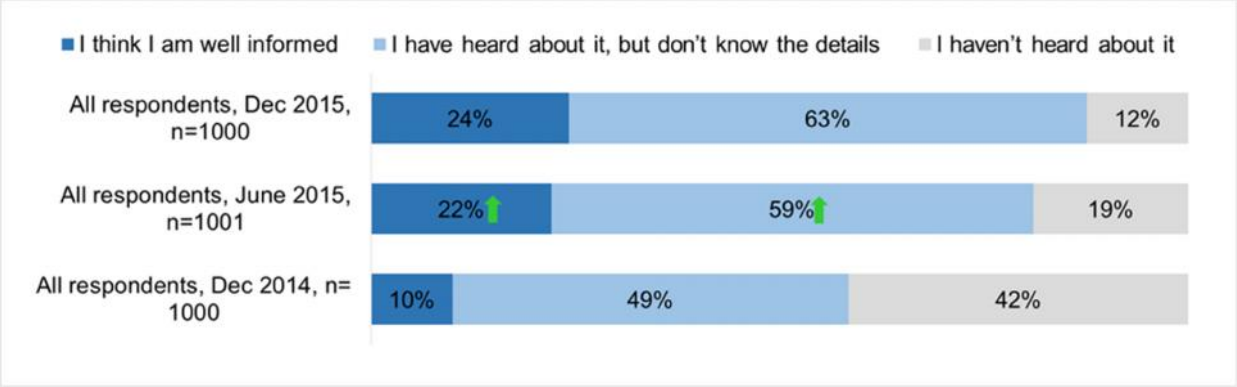
38 institutions: 16 meetings with national and municipal institutions 3 Technical work group meetings	43 institutions: 110 meetings with national and municipal institutions and nongovernmental organizations; 4 Technical work group meetings	47 institutions: 30 meetings with national institutions, incl. in Cabinet of Ministers; 1 Technical work group meeting
21 municipality: 24 meetings with leaders of municipalities and specialists	15 municipalities: 73 meetings with leaders of municipalities and specialists	15 municipalities: 8 meetings with leaders of municipalities and specialists

1 Municipal work group meeting	4 Municipal work group meeting	1 Municipal work group meeting
Public information activities: Press releases 3, interview 1	Public information activities: 33 EIA initial and public hearing of the EIA report; 66 meetings, incl. project, municipal planning, entrepreneurs and inhabitants, and municipalities-inhabitants work groups; 1240 individual consultations, incl. info phone, info email, and face to face consultations before public hearing meetings; 126 publications; 5 interviews in radio and TV; International Rail Baltica conference (140 participants); Participation in TEN-T Days 2015; Project website http://railbaltica.info/ (70 thous. visits)	Public information activities: 190 individual consultations, incl. info phone, info email; 33 publications; 1 interview; Project website http://railbaltica.info/ (30 thous. visits)
Project meetings with Contracting Authority: 2 Steering committee meetings; 19 Project coordination work group meetings; Project inner website www.rblatvija.lv	Project meetings with Contracting Authority: 8 Steering committee meetings; 56 Project coordination work group meetings. Data Exchange server.	Project meetings with Contracting Authority: 3 Steering committee meetings; 26 Project coordination work group meetings. Data Exchange server.

To determine the **attitude of the Latvian population** towards the implementation of the Rail Baltica project, the enterprise "Mārketinga praktiķu ACADEMIA" Ltd., commissioned by the general partnership "RB Latvija", carried out three online surveys of internet users – in December 2014, June and December 2015. Online surveys are widely used for public and private sector purposes whenever there is a need of surveying the economically active inhabitants. The survey made use of a precisely selected and segmented database consisting of 1 001 respondents – a sample that corresponds to the general sample of the Latvian inhabitants aged between 18 and 65.

During the Study, the awareness of locals about the Rail Baltica project has increased (in December 2014 – 59%, in June 2015 – 81%, in December 2015 – 87%); and it shall be noted that the proportion of the inhabitants thinking they are well informed about the Project has risen from 10% in December 2014 to 24% in December 2015 (Figure 76).

Figure 76 ***Awareness of Latvian inhabitants about Rail Baltica project***



According to the December 2015 survey, the total support of inhabitants is high – **86.1 % of the Latvian population are in favour of the Rail Baltica project.** During the Study, this has changed in line with the information acquired at the public discussions regarding the envisaged impact on the immovable properties (Figure 77).

Among the most often mentioned arguments for supporting the Project: quicker and easier transport and travel, the development of Latvia, cooperation with the other Baltic States and the European Union. There are no significant differences in answers between the Latvian regions.

The key argument of the opponents of the Project is related to the low topicality of the project at present. The majority of these respondents maintain that it would be appropriate to spend these funds on other things (defence, social security, integration of refugees, etc.). Other arguments against the Project – the high costs thereof and doubt of sufficient passenger and cargo flow. However, the majority of the respondents are of the opinion that the project will be feasible for Latvia.

Figure 77 ***Support by Latvian inhabitants for the Rail Baltica project***