

Table 109 below summarises the costs in the cost benefit analysis including a calculation of the total cost discounted to 2010 to take account of the fact that benefits and costs that occur in the future are valued less highly than those that occur in the shorter term.

Table 109 - Construction Costs used in Economic Appraisal

Total costs (€ '000,000)	Cost Estimate	Costs used in CBA	
		Undiscounted	Discounted
Design and Planning	102	102	71
Land	149	149	100
Construction Costs	3,390	3,208	1,692
Project Management	34	34	21
Site Supervision	3	3	2
VAT	744	0	
Residual Value		-1,238	-117
Total Capital Cost	4,422	2,257	1,769

8.7.3 Rail Manager Costs and Benefits

Once constructed the rail manager has to incur annual maintenance costs in order to ensure that the infrastructure remains available for passenger and freight services and safe to use. This cost will be offset to some degree by the track access charge that is paid to the manager by both passengers and freight service operators. These different cost elements are discussed below.

8.7.3.1 Maintenance Costs

The following elements have been included in the maintenance costs estimate:

Track	Price	Frequency
<i>Rail Grinding</i>	1000 € per km.	Once every 3 years
<i>Ballast Supplement</i>	1000 € per km.	Once every 5 years
<i>Track Tamped</i>	4000 € per km.	Once every 5 years
<i>Tensioning and Control</i>	1000 € per km.	Once every 5 years
<i>Insulated joint replacement</i>	4000 € each, 1.3 per km.	Once every 8 years
<i>Ballast cleaned</i>	30,00 € per km.	Once every 20 years
<i>Larger switch parts replaced</i>	15,000 € per switch. 1 switch per 5 km	Once every 20 years
Signalling and Telecommunication		
<i>Safety installations (station)</i>	1 million € per station (1 station per 20 km)	Once every 20 years
<i>Safety installations (switches)</i>	100,000 € per switch (1 station per 20 km, 4 switches per station)	Once every 20 years
<i>Safety installations (blocks)</i>	100,000 € per block, 1 block per 3 km	Once every 20 years
Overhead contact line / the catenary system		
Foundations and Poles		Assumed not to require replacement during appraisal period
All suspensions and catenary cables:	1,500 € per suspension, 20 suspensions per km	Once every 25 years
The overhead contact line	15,00 € per km.	Once every 25 years
Surrounding areas		
Weed control	5 m ² per 1 metre of track 0.1€ per m ²	

Over the 30 year appraisal period this amounts to a total maintenance cost of 353 million Euro, equivalent to an average annual cost of 11.8 million Euro. It should be noted however that due to the differing replacement intervals the annual maintenance costs vary from year to year.

The maintenance costs has been discounted to a 2010 base to take account of the fact that benefits and costs that occur in the future are valued less highly than those that occur in the shorter term. This results in a total discounted maintenance cost over the 30 year appraisal period of 61 million Euros.

The maintenance rates per km of track are the same in all countries. Therefore when splitting maintenance costs between nations costs have been allocated according to the track length in each country. This leads to total discounted maintenance cost over the 30 year appraisal period of 19 million Euro in Estonia, of 20 million Euro in Latvia and of 22 million Euro in Lithuania.

8.7.3.2 Track Access Charges

The track access charge is paid by the passenger and freight operators to the rail manager. It is a reservation charge and allows the operator to use the infrastructure that is provided by the manager for a specific train path.

The current size of charge and method of calculation of track access charges vary across the three Baltic states, a common feature, however, is that the values currently charged are significantly higher than charged elsewhere in the EC. It is important in the analysis that the charges used reflect the charges that will be adopted if Rail Baltica is implemented. This study has therefore derived typical charges based upon the approach outlined in EC directives.

The EC document 2010/0253(COD) 'Proposal for a Directive of the European Parliament and of the council establishing a single European railway area (recast)' outlines proposals for changes to the directives covering the rail sector. This document includes changes to the principles of charging (article 31); and introduces exceptions to charging principles (article 32) to improve the coherence of national track access charging schemes through the introduction of common criteria for identifying market segments on which operators may be able to pay a mark-up in access charge

Article 31 (Principles of charging) indicates that *"the charges for the minimum access package shall be set at the cost that is directly incurred as a result of operating the train service". Annex VIII, point 1 goes on to identify that the "direct costs of the train service referred to in Article 31(3), which are related to infrastructure wear and tear, shall exclude the following items:*

- (a) *Network-wide overhead costs, including salaries and pensions;*
- (b) *Interest payable on capital;*
- (c) *More than one tenth of costs related to scheduling, train path allocation, traffic management, dispatching and signalling of a train run;*
- (d) *Depreciation of information, communication or telecommunication equipment;*
- (e) *Costs related to real estate management, in particular acquisition, selling, dismantling, decontamination, recultivation or renting of land or other fixed assets;*
- (f) *Social services, schools, kindergartens, restaurants;*
- (g) *Costs related to acts of God, accidents, service disruptions.*

When direct costs exceed, on a network-wide average, 35 % of average costs of maintaining, managing and renewing the network calculated on the basis of a train kilometre run, the infrastructure manager shall justify this in detail to the regulatory body. The average costs calculated for this purpose shall exclude cost elements referred to in points (e), (f) or (g)."

However, Article 32 (Exceptions to charging principles) identifies that “*in order to obtain full recovery of the costs incurred by the infrastructure manager a Member State may, if the market can bear this, levy mark-ups on the basis of efficient, transparent and non-discriminatory principles, while guaranteeing optimal competitiveness in particular of international rail freight.*” Annex VIII, point 3 identifies the market segments which the infrastructure manager has to demonstrate to the regulatory body have the ability to pay mark-ups. This includes a distinction between passenger and freight services;

The EC document indicates that the starting point for setting track access charges should be a calculation of direct costs to the rail manager of the services running. This is calculated below based on the total rail managers maintenance cost over the appraisal period, and the total number of train km.

Table 110 - Track Access Charges based on Direct costs

Total Maintenance Cost		353	million Euro
Total train km	Freight	326	
	Passenger	220	million train km
	Total	546	
Track access charge		€ 0.65	per train km

These initial track access charges have been implemented in the financial analysis with the result that the Rail manager makes a loss (FNPV/C of -1,905 million Euro over the appraisal period excluding the EU grant and a FNPV/K of -286 million Euro over the appraisal period including the EU grant) while the operators make a profit, with a discounted NPV of 429 million Euro for the passenger operator (MIRR of 7.35%) and 875 million Euro for the freight operator (MIRR of 7.70%) over the appraisal period. This suggests that, in accordance with Article 32 of EC document 2010/0253(COD) mark-ups may be applied to obtain full recovery of the costs incurred by the infrastructure manager.

Track access Charges have been varied in an iterative process to minimise the financial losses of the rail manager whilst still providing financial return for the operators. The following optimal charges were determined:

Passenger services € 3.95 per train km

Freight services € 5.92 per train km

The charges have been set to meet the following requirements:

- Increase the rail manager's internal rate of return on investment cost (excluding impact of EU grant) above zero
- Equalise the passenger and freight operators profitability over the appraisal period as measured by their Modified Internal Rate of Return (MIRR)

This charging arrangement leads to a situation where:

- The **rail manager** has an internal rate of return over the appraisal period on the cost of investment excluding the impact of the EU grant (FIRR/C) of 0.05%. When the EU grant is included in the financial analysis the financial return on own national resource (FIRR/K) is 3.70%. These are higher than the rates of return achieved by the manager when no mark-up is added to the track access charge (FIRR/C of -2.69% and FIRR/K of 1.93%).
- The **passenger rail operator** has profitability over the appraisal period of 6.18% (as calculated by the Modified Internal Rate of Return (MIRR). This is a reduction from a profitability of 7.35% when no mark-up is added to the track access charge
- The **freight rail operator** has profitability over the appraisal period of 6.22% (as calculated by the Modified Internal Rate of Return (MIRR). This is a reduction from a profitability of 7.70% when no mark-up is added to the track access charge
- The approach adopted to determine whether the market can bear the cost of the track access charge mark-up has been based on an assessment of the level of operator profitability (calculated from the modified internal rate of return of the revenue in-flows on the operating cost out-flows including track access charges). As part of project development it may be necessary

for the infrastructure manager to conduct a more detailed market analysis, potentially split by further market segments, to compare costs of Rail Baltica against existing competing services to confirm the ability of the market to bear the cost of track access mark-ups. The analysis will, however, need to recognise that the quality of the service provided by Rail Baltica is higher than existing modes in terms of connectivity.

Over the 30 year appraisal period this amounts to a total passenger service track access cost of 744 million Euros, equivalent to an average annual cost of 24.8 million Euro; and a total freight service track access cost of 1,764 Million Euro, equivalent to an average annual cost of 58.8 million Euro.

The track access costs have been discounted to a 2010 base to take account of the fact that benefits and costs that occur in the future are valued less highly than those that occur in the shorter term. This results in a total discounted track access cost over the 30 year appraisal period of 351 million Euro for freight services and 170 million Euro for passenger services.

The track access charges per train km are the same in all countries. Therefore when splitting charges between nations costs have been allocated according to the train km in each country (this includes an element allocated to Poland). This leads to total discounted track access cost over the 30 year appraisal period of 108 million Euro in Estonia, of 111 million Euro in Latvia and of 125 million Euro in Lithuania.

Note: Additional charges for the use of contact network in Lithuania is taken into consideration and is included as part of the overall track access charges.