ANNEX 1

Cost-Benefit Analysis of the new rail connections between the Livorno port, the Guasticce Freight Village and the rail lines Pisa-Collesalvetti-Vada and Firenze-Pisa

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Economic Analysis

Overview

The economic analysis assesses the contribution of a project to overall economic welfare. The scope of the analysis is to establish whether society as a whole is better off with or without the project.

The economic analysis differs from the financial one, since its aim is to measure the social value of a project. In assessing the social value of a project, it is important to consider both the advantages and disadvantages for all the parties involved (in particular, the users) and not only those relevant to the promoters or backers of the investment.

The rule of thumb in economic analysis is that an investment should be advantageous to the community, which means that the benefits yielded should be larger than the costs borne and they should include any welfare gain and loss.

The overall basic calculation is summarised below:

Overall Economic Impact	=	Change in transport user benefits (Consumer surplus)	+	Change in system operating costs and revenues (Producer surplus and impact on Government)	+	Change in external costs (Environmental costs, accidents, etc.)	-	Investment costs

The users' benefits are measured in terms of aggregate individuals' preferences that, in turn, are represented by the willingness to pay of the users (the monetary values are assumed as universal indicators).

The demand curve can be considered as representing a consumer's willingness to pay for a certain amount of a good at different prices, and therefore, it represents the utility (or the gross benefit) that a consumer enjoys. The net benefit is the difference between the gross benefit and the real amount of money paid (namely, the real monetary sacrifice borne including non-monetary components such as travel time). This difference represents the consumer surplus. The variation of consumer surplus with and without the project is the measure of user benefit.

If other agents are involved (producers, government, or non-users), the project's appraisal should also consider their benefits (or costs) as well, and these should be summed (with the proper signs) with the consumer surplus, to determine the final result.

Beyond a project's investment costs, the benefits for users and producers, and the impact on government, the analysis must also take account of the so-called external effects, among which the most important ones are the environmental and safety related impacts.

Finally, benefits and costs flows have to be distributed through time in order to calculate the economic performance indicators of the project.

Costs

Investment costs are an outcome of the technical analysis and they are allocated over the construction period.

Conventionally, the investment costs encompass not only the construction costs, but also the non-routine maintenance and replacement costs.

Besides, the operating costs both with and without the project (including routine maintenance) have been taken into account to calculate the producer surplus.

Investment and maintenance costs

According to the above, investment and maintenance economic costs have been calculated starting from the financial costs estimated by the project designers, subtracting the indirect taxes (VAT), as these are a money transfers, and applying a coefficient which considers the country high level of involuntary unemployment.

The following tables summarize the financial investment and maintenance costs.

Tab. .1 Financial investment costs (MEuro net of VAT)

Cost categories	WP 1 Progetto Scavalco	WP 2.1 Intervento collegamento Interporto linea Pisa-Vada	WP 2.2 Bypass stazione di Pisa
Value of works to tender	12.64	68.11	61.22
Security charges	0.38	2.04	1.84
Expropriation and compensation	0.00	2.37	3.00
Overlaps/ interferences	0.60	3.00	2.50
Laboratory tests	0.13	0.70	0.63
Verification and investigations	0.39	2.10	1.89
Contingencies	0.65	3.51	3.15
Funds for friendly settlements	0.39	2.10	1.89
Provisions	0.13	0.70	0.63
Archelogical and special studies	0.13	0.70	0.63
General expenses	1.54	8.53	7.74
Total	16.98	93.88	85.12

Tab. .2 Financial costs of non-routine maintenance (MEuro net of VAT)

Cost categories	*WP 1*		*WP 2.1*		*WP 2.2*	
	Cost	**Useful life (years)**	**Cost**	**Useful life (years)**	**Cost**	**Useful life (years)**
Ballast reinforcements	0.00		0.84	5	0.66	5
Equipment	1.55	25	8.58	25	5.98	25
Primary power supply and contact line	0.00		3.60	25	2.85	25
Signalling and SCMT	0.58	10	2.60	10	2.60	10

The estimation of the investment costs of the project is based on the financial costs provided by the project designers. However, in the cost-benefit analysis, costs are thought of as "opportunity costs". Without the project the scarce resources (labour, capital, land) would have had alternative uses. The approach "with and without" compares the output value of the project with the output value that the resources allocated to the project could have produced in their best alternative use (their opportunity cost). Therefore the financial project costs cannot always be used as such in the economic analysis since sometimes they do not represent the opportunity cost of the resources.

In order to truly represent the social value of project inputs, appropriate shadow prices should be applied to the financial costs.

The most important candidate for shadow pricing is labour.

To calculated the shadow price of labour it has been first assumed that the incidence of labour costs on the total costs of the tendered works is equal to 22% and to this percentage of the costs has been applied a shadow price calculated according to the following equation:

Conversion factor = (1-u)(1-t) [1]

Where *u* is the unemployment rate and *t* is the taxation rate on the gross pay.

The taxation rate on the gross pay is 61%[2].

The unemployment rates used in the calculation are reported in table 3 and in figure 1.1.

[1] Cfr. European Commission - Directorate General Regional Policy, *Guide to Cost-Benefit Analysis of investment projects*, 2008, p. 216.

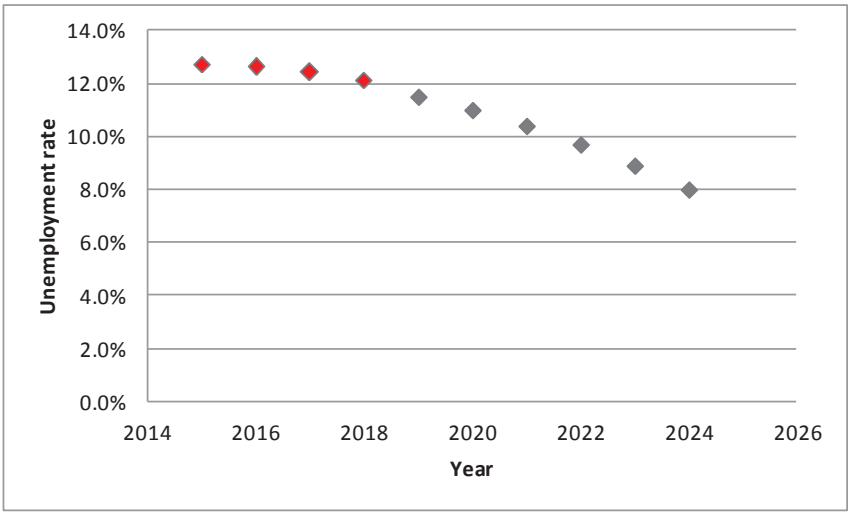
[2] Based on data provided by the Ufficio Studi CGIA - Mestre on gross and net salary of manual workers

Tab. .3 Unemployment rates (%)

Year	Unemployment rate
2015	12.7
2016	12.6
2017	12.4
2018	12.1
2019	11.5
2020	11.0
2021	10.4
2022	9.7
2023	8.9
2024	8.0

The unemployment rates until the year 2018 have been drawn from EY, *Eurozone* (Dec. 2014). Then it has been assumed that the trend forecasted by this source continues for the years after 2018 .

Figure 1.1 Unemployment rates



The resulting conversion factors for labour are shown in table 4.

Tab. .4 Conversion factors for labour

Year	Conversion factor
2017	0.342
2018	0.343
2019	0.345
2020	0.347
2021	0.349
2022	0.352
2023	0.355
2024	0.359

The following table shows the economic costs calculated applying these conversion factors.

Tab. .5 Economic investment costs (MEuro)

Cost categories	WP 1 Progetto Scavalco	WP 2.1 Intervento collegamento Interporto linea Pisa-Vada	WP 2.2 Bypass stazione di Pisa
Value of works to tender	10.82	58.31	52.41
Security charges	0.38	2.04	1.84
Expropriation and compensation	0.00	2.37	3.00
Overlaps/ interferences	0.60	3.00	2.50
Laboratory tests	0.13	0.70	0.63
Verification and investigations	0.39	2.10	1.89
Contingencies	0.65	3.51	3.15
Funds for friendly settlements	0.39	2.10	1.89
Provisions	0.13	0.70	0.63
Archelogical and special studies	0.13	0.70	0.63
General expenses	1.54	8.53	7.74
Total	15.16	84.09	76.32

The conversion factor of the investment costs is given by the ratio between the overall economic and financial costs. The resulting conversion factors have been applied to the financial non-routine maintenance cost.

Tab. .6 Conversion factors for non-routine maintenance cost

Year	Conversion factor
2017	0.892
1018	0.892
2019	0.893
2020	0.897
2021	0.897
2022	0.897
2023	0.898
2024	0.899

The results of the estimation of economic cost of non-routine maintenance according to the conversions factors above are shown in the following table.

Tab. .7 Economic costs of non-routine maintenance (MEuro)

Cost categories	WP 1		WP 2.1		WP 2.2	
	Cost	Useful life (years)	Cost	Useful life (years)	Cost	Useful life (years)
Ballast reinforcements			0.72	5	0.56	5
Equipment	1.33	25	7.34	25	5.12	25
Primary power supply and contact line			3.08	25	2.44	25
Signalling and SCMT	0.50	10	2.22	10	2.22	10

At this stage, the duration of the construction period is known, but there is no information available on how the works are allocated over these years. Therefore the construction costs of each component of the project have been equally distributed over the investment period as shown in Table 5.

Tab. .8 Economic investment flow (MEuro)

Year	WP1	WP2.1	WP2.2	Total
2017	-5.1	0.0	0.0	-5.1
2018	-5.1	0.0	0.0	-5.1
2019	-5.1	-21.0	0.0	-26.1
2020	0.0	-21.0	-15.3	-36.3
2021	0.0	-21.0	-15.3	-36.3
2022	0.0	-21.0	-15.3	-36.3
2023	0.0	0.0	-15.3	-15.3
2024	0.0	0.0	-15.3	-15.3

Benefits

Benefits to users were considered according to the demand analysis (to which we refer for details) and, in particular, on the basis of the container traffic that is expected from the base growth scenario.

The demand analysis for the Port of Livorno has focused on the proportion of traffic that is more directly interested by the rail segment that the project can improve in terms of infrastructure and efficiency, especially as far as costs and operating times are concerned.

These trades were identified according to the following product categories:

• Containers

• Ro-Ro

• Cars

It has been a long time since these three identified categories have represented significant traffic movements at the Port of Livorno. Nevertheless, the rail "attitude" is different and the rail segment absorbs only a relatively small modal share of the entire traffic (12% at present), although but potentially very interesting for container, absent, also for its own nature, as regards the Ro-Ro, interesting but with a variable pattern for cars.

Based on these distinctions, the analysis was carried out according to different approaches: modeling at the European level for the container, the results of which used directly in the Cost – Benefit Analysis, always with modeling support for the Ro-Ro traffic and through simplified estimates traffic for the cars, the results of both these analyzes used to strengthen the framework forecasting future demand, without direct impact in the estimates of the Cost - Benefit analysis: this on the safe side, to ensure more direct link possible between railway investments proposed and expected traffic.

Change in transport user benefits

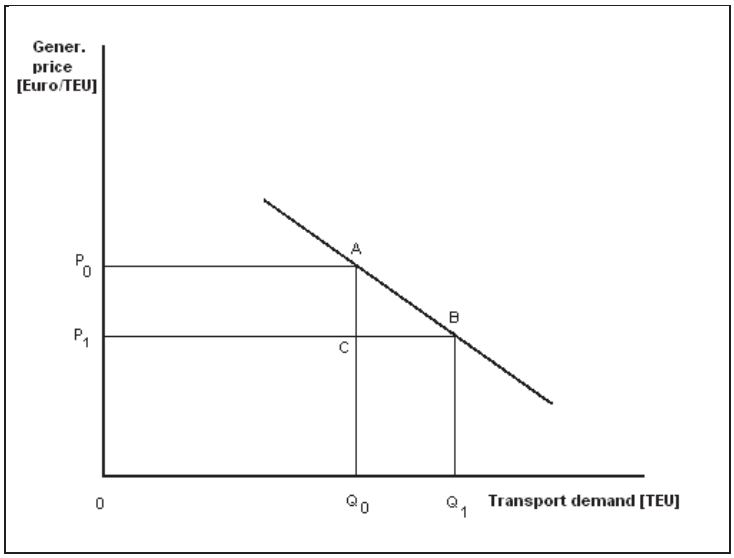
User benefits for transport projects can be defined by the concept of the consumer surplus. This is defined as the benefit which a consumer enjoys in terms of the difference between his/her Willingness To Pay (WTP) and the actual generalised cost.

For the rail freight transport, the generalised cost for users is simply represented by the sum of the fares charged and the time taken expressed in monetary terms.

The benefits for users are calculated as the difference between the consumer surplus with and without the project .

The changes in consumer surplus for railway users is shown in Figure .2 where A is the condition without the project, given by the "without project" traffic Q_0 and the "without project" generalized price P_0. In the project scenario the generalized price lowers from P_0 to P_1 and the demand increases from Q_0 a Q_1.

Figure .2 – Change in railway users surplus



The change in the users surplus is given by the area P_0ABP_1, which is made of P_0ACP_1, the savings of the existing traffic, and ABC, the benefits for the newly generated, or diverted traffic.

In the project under scrutiny the absolute values of P_0 and P_1 are not known, but is known variation. The following table presents the estimated surplus variation.

Table .9 Surplus variation

Year	Demand (TEU)		Cost variation (€/TEU)	Surplus variation (MEuro)
	Reference Solution	Project		
2020	101,400	162,380	20.7	2.73
2022	108,782	173,968	20.9	2.95
2023	112,473	234,818	28.7	4.98
2030	138,311	287,520	26.7	5.69
2040	152782	317601	26.7	6.29

Unperceived costs

For private transport, it should be noted that vehicle operating costs, in addition to the labour and fuel costs that are both considered in the modal choice, include unperceived costs as well.

Due to project implementation, the distances travelled by the vehicles vary, as well as the resources consumed and the costs related.

The number of vehicles has been calculated assuming an average loading factor of 1.8 TEU. Table 10 shows the driving distances in the Reference Solution and in the “with project” solution.

Table .10 Variation in driving distances (Million Truck-km)

Year	Reference Solution	Project	Variation
2020	50.4	44.6	-5.8
2022	54.0	47.8	-6.2
2023	55.8	49.4	-6.4
2030	68.5	58.6	-9.9
2040	75.7	64.7	-11.0

The unperceived cost per vehicle has been estimated starting from the data available for a 44 tons vehicle and the resulting costs are 0.392 Euro per vehicle-km.

The benefits deriving from the reduction of driving distances are therefore:

Table .11 Changes (benefits) of unperceived costs (MEuro)

Year	Benefits
2020	2.3
2022	2.4
2023	2.5
2030	3.9
2040	4.3

Change in system operating costs and revenues

Cost-benefit analysis is concerned not only with consumer surplus, but with total social surplus. This includes producer surplus as well as consumer surplus. The changes in the producer surplus include operators' profits or losses. Changes in Government revenues are due to changes in the volume fuel taxes earned.

Producer surplus

The producer surplus is the excess of revenues over costs. Thanks to the project the railway infrastructure manager, the railway undertakings and the highway concessionaires will all experience some positive or negative changes in their revenues.

The railway infrastructure manager

The change of producer surplus of the railway infrastructure manager has been calculated only for the part of the network subject to the investment.

The revenues have been estimated by applying to the trains-km (based on the number of trains and routes) the actual access and use fees:

Access fee main network (€)	55.942
Node access fee (€)	55.236
Electric traction (€/km)	0.322
Network use fee (€/km)	1.031

In the "with project" scenario, the number of train-km has been estimated by assuming that the new link which is 15 km long (against the 20 km of the existing one) will be used by 30% of the traffic in 2023 and 50% in 2025.

On the costs side, the estimated inputs are based on the unit costs calculated by the designers times the length of the existing lines in the Reference Solution (18.2 Km) and the length of the existing lines plus the new line (35 Km) in the "with project" solution.

The results are summarized in the following table.

Table .12 Change of producer surplus of the railway infrastructure manager

Year	Reference Solution				Project				Surplus variation
	N. Trains	Revenues	Costs	Surplus	N. Trains	Revenues	Costs	Surplus	
2020	2028	0.28	-0.15	0.13	3248	0.45	-0.28	0.16	0.03
2022	2176	0.30	-0.15	0.15	3479	0.48	-0.29	0.19	0.05
2023	2249	0.31	-0.15	0.16	4696	0.64	-0.29	0.35	0.19
2030	2766	0.38	-0.15	0.23	5750	0.78	-0.29	0.49	0.26
2040	3056	0.42	-0.15	0.27	6352	0.86	-0.29	0.57	0.30

Railway undertakings

Even though the costs of the railways services are not public, the services are provided on a commercial basis and hence it can be reasonably assumed that the revenues are covering the average operating costs. With the project, the traffic will increase and most likely this will result in some economies of scope, which are difficult to be assessed: following a conservative approach the analysis is not considering this potential benefits.

Highways concessionaires

Because of the project, origins and destinations and highway driving distances of the road traffic will not be the same as in the Reference Solution. As a consequence, the highway concessionaires will suffer revenue losses, as shown in the following table.

Table .13 Changes in motorway driving distances, by region (000 vehicle-km)

Year	Toscana	Umbria/ Marche	Emilia	Liguria	Long distance	Total
2020	3,250	0	-3,611	0	-5,416	-5,778
2022	3,484	0	-3,871	0	-5,806	-6,194
2023	7,197	-1	-4,002	-2,601	-12,004	-11,410
2030	8,833	-1	-4,912	-3,193	-14,734	-14,008
2040	9,757	-1	-5,426	-3,527	-16,276	-15,473

It has been estimated that 65% of the distances are travelled on highways, on tolled motorways. By multiplying the percentage of the total vehicle-km by the tolls charged to a five axles vehicle, net of VAT, the revenue loss of the motorway concessionaires has been calculated.

Table .14 Changes in toll revenues, by region (MEuro)

Tolls (€/Km)	Toscana	Umbria/ Marche	Emilia	Liguria	Long distance	Total
	0.145	0.212	0.212	0.210	0.153	
2020	0.3	0.0	-0.5	0.0	-0.5	-0.7
2022	0.3	0.0	-0.5	0.0	-0.6	-0.8
2023	0.7	0.0	-0.6	-0.3	-1.2	-1.4
2030	0.8	0.0	-0.7	-0.4	-1.5	-1.7
2040	0.9	0.0	-0.7	-0.5	-1.6	-1.9

Government revenues' effects

The project leads to change in government surplus by altering the tax receipts.

The reduction in vehicles-km shown in Table 10 brings together a reduction in fuel tax collected by the Government. The variation in Government income due to lower fuel consumption has been estimated by multiplying an average consumption of 0,35 liters per km by the excise taxes on fuel applied in the country, namely 0,617€ per liter. Results are reported in table 15.

Table .15 Changes in Government revenues (MEuro)

Year	Reference Solution	Project	Variation
2020	10.9	9.7	-1.3
2022	11.7	10.4	-1.3
2023	12.1	10.7	-1.4
2030	14.8	12.7	-2.2
2040	16.4	14.0	-2.4

Change in external costs

An externality is said to exist when the production or consumption of a good in one market affects the welfare of a third party without any payment or compensation being made. The most important externalities arising when transport projects are implemented are related to both environment and safety issues.

1.1.1.1 Environmental costs

Less vehicles km brings together lower road transport externalities, only partially compensated by an increase in rail transport environmental impacts due to an increase in train-km (see Table 16).

Table .16 Changes in train-km (Million)

Year	Reference Solution	Project	Variation
2020	0.51	0.95	0.45
2022	0.54	1.02	0.48
2023	0.56	1.58	1.01
2030	0.69	1.93	1.24
2040	0.76	2.13	1.37

The following paragraphs summarise the way these externalities have been calculated.

Air pollution

For the road transport , the calculation of the environmental costs of air pollution has been based on standard emissions per vehicle km, multiplied by the kilometre distance run in the with and without project scenarios and by a monetary value, differentiated according to the density of population close to a source of air pollution (the closer to an air pollution source the population is, the more negative effects it will suffer and the higher the marginal costs will be).

The unit costs per vehicle-km applied are the one estimated by Korzhenevych et al. (2014) for a >32 tons EURO V vehicle.

Table .17 Marginal external air pollution costs in €ct/vkm (2010)

Vehicle	Category	EURO-Class	Urban	Suburban	Interurban	Motorway
			€c/vkm	€c/vkm	€c/vkm	€c/vkm
Rigid HGV	>32 t	EURO V	7.8	6.2	3.4	2.3

Source: Korzhenevych et al. (2014)

In order to calculate the external costs of pollution, the following distribution of driving distances has been assumed.

Table .18 Distribution of driving distances according to the different exposure categories

	Urban	Suburban	Interurban	Motorway	Total
% vehicle-km	0%	25%	10%	65%	100%

The same study provides the estimate for the marginal pollution cost for railways, namely 42.2 €ct/train-km.

The final results are shown in the following Table .19.

Table .19 Air pollution costs (MEuro)

Year	Rail costs	Road costs	Benefit
2020	0.19	-0.20	-0.01
2022	0.20	-0.21	-0.01
2023	0.43	-0.22	0.21
2030	0.52	-0.34	0.18
2040	0.58	-0.37	0.20

Costs and benefits in Table 19 are in Euro 2010. There are values that are expected to change over time. This happens for values that depend on per capita income like environmental costs . For that reason, these costs and benefits have been increased over time assuming a 1% growth rate of GDP per capita.

Global warming

The Table 20 shows the climate change marginal costs for road transport.

Table .20 Climate change marginal costs for road transport - EU average (€ ct/vkm)

Vehicle	Category	EURO-Class	Urban	Rural	Motorway
			€c/vkm	€c/vkm	€c/vkm
Rigid HGV	>32 t	EURO V	11.2	8	6.7

Source: Korzhenevych et al. (2014)

The marginal climate change cost for railway mileage is 1.81 €ct/train-km (Korzhenevych et al., 2014).

Applying the same distribution of driving distances shown in Table 18, we get the following results.

Table .21 Climate change costs (MEuro, 2013)

Year	Rail	Road	Benefit
2020	0.01	-0.39	0.39
2022	0.01	-0.42	0.41
2023	0.02	-0.44	0.42
2030	0.02	-0.68	0.65
2040	0.03	-0.75	0.72

These costs and benefits too are linked to the per capita income and thus have been increased over time at the same rate applied for the environmental ones (1% per year).

However, it has not been considered sufficient to represent real future costs. These short term costs are based on current or near future costs. Long-term external costs depend on the assumed scenario describing the development of global greenhouse gas emissions.

Shadow prices of climate change till 2050 has been included in the analysis according to HEATCO (2006) [3].

Table .22 Shadow prices based on Watkiss et al. (2005), €2002 per tonne of CO_2 equivalent emitted

Year of emission	Central guidance
2010-2019	26
2020-2029	32
2030-2039	40
2040-2049	55
2050	83

The trend of shadow prices over time has been used to increase future benefits of the project. Results are summarised in the table below.

Table .23 Climate change benefits (MEuro)

Year	Benefit
2020	0.5
2022	0.6
2023	0.6
2030	1.2
2040	2.1

[3] Pag. 117.

1.1.1.2 Safety

The reduction of the distances travelled by road (in vehicles-km) determines also a reduction of the total number of accidents. In this respect, it has to be considered that the road accident rate is higher than the rail one. The shadow prices used have been introduced in the analysis according to Korzhenevych et al. (2014).

Rail (€ /1000 vkm)	0.20
Road (€ct/vkm)	1.72

The results obtained are summarised in Table 16.

Table .24 Accident costs (MEuro)

Year	Rail costs	Road costs	Benefici
2020	0.0001	-0.099	0.11
2022	0.0001	-0.106	0.12
2023	0.0002	-0.110	0.12
2030	0.0002	-0.170	0.21
2040	0.0003	-0.188	0.25

The appraisal period and the residual value

An appraisal period of 25 years has been assumed, as corresponding to the economic life of equipment, primary power supply and contact line. However, the appraisal period is shorter than the economically useful life of the project. Indeed, it has to be considered that non routine maintenance works recover the project to full functionality well beyond 25 years. Therefore the residual value of the investment has been assumed equal to 158.1 million Euro, 90% of total investment costs, in order to take into account that some non routine maintenance costs occur a few years before of the final year considered in the analysis (namely: 4.3 million Euro occur 5 years before the final year and 11.7 million Euro occur 2 years before). However, the residual value assumed is lower than the net benefits of the 25 years after the last year of the analysis, discounted at the 25th year (equal to 165.6 million Euro).

Flows of benefits and costs

Between the opening year (the first year where the project is producing benefits) and the threshold year, costs and benefits have been estimated by a linear interpolation.

In the following Table .25, the flows of benefits and costs over years of the project is provided.

Table .25 Flows of benefits and costs (MEuro)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Investment Costs																		
WP1	0.0	0.0	-5.1	-5.1	-5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.5	0.0	0.0	0.0
WP2.1	0.0	0.0	0.0	0.0	-21.0	-21.0	-21.0	-21.0	0.0	0.0	0.0	0.0	-0.8	0.0	0.0	0.0	0.0	-3.1
WP2.2	0.0	0.0	0.0	0.0	0.0	-15.3	-15.3	-15.3	-15.3	-15.3	0.0	0.0	0.0	0.0	-0.6	0.0	0.0	0.0
Residual value																		
Total	0.0	0.0	-5.1	-5.1	-26.1	-36.3	-36.3	-36.3	-15.3	-15.3	0.0	0.0	-0.8	0.0	-1.1	0.0	0.0	-3.1
Benefits																		
Consumers' Surplus	0.0	0.0	0.0	0.0	0.0	2.7	2.8	3.0	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.8
Unperceived costs	0.0	0.0	0.0	0.0	0.0	2.3	2.3	2.4	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	3.9	4.0
Motorway toll revenues	0.0	0.0	0.0	0.0	0.0	-0.7	-0.8	-0.8	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.7	-1.7	-1.8
Railway infrastructure manager	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
Fuel taxes	0.0	0.0	0.0	0.0	0.0	-1.3	-1.3	-1.3	-1.4	-1.5	-1.6	-1.7	-1.8	-1.9	-2.0	-2.2	-2.2	-2.2
Air pollution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Climate change	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.4
Accidents (safety)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Net Benefits	0.0	0.0	-5.1	-5.1	-26.1	-32.6	-32.5	-32.3	-8.1	-7.7	7.9	8.2	7.8	8.9	8.1	9.1	9.3	6.4

Table 25 Flows of benefits and costs (MEuro)

	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
Investment Costs																	
WP1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-1.4	0.0	0.0	0.0	0.0	-0.5
WP2.1	0.0	0.0	0.0	0.0	-0.8	0.0	0.0	0.0	0.0	-3.1	0.0	0.0	0.0	0.0	-11.7	0.0	0.0
WP2.2	0.0	-2.9	0.0	0.0	0.0	0.0	-0.6	0.0	0.0	0.0	0.0	-2.9	0.0	0.0	0.0	0.0	-8.5
Residual value																	158.1
Total	0.0	-2.9	0.0	0.0	-0.8	0.0	-0.6	0.0	0.0	-3.1	0.0	-4.3	0.0	0.0	-11.7	0.0	149.1
Benefits																	
Consumers' Surplus	7.3	7.4	7.5	7.6	7.6	7.7	7.8	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9
Unperceived costs	4.0	4.1	4.1	4.1	4.2	4.2	4.2	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Motorway toll revenues	-1.2	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3
Railway infrastructure manager	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Fuel taxes	-2.2	-2.2	-2.3	-2.3	-2.3	-2.3	-2.3	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4
Air pollution	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Climate change	1.5	1.6	1.6	1.7	1.8	1.9	1.9	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Accidents (safety)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Net Benefits	9.6	6.9	10.0	10.1	9.5	10.5	10.0	10.8	10.8	7.7	10.8	6.5	10.8	10.8	-0.9	10.8	159.9

Performance indicators

The economic project's performance has been measured according the two indicators, namely:

- the Economic Net Present Value (ENPV)
- the Economic Internal Rate of Return (EIRR)

The analysis shows the results as follows.

The Economic Net Present Value of the project, calculated introducing a social discount rate of 3,5%, is equal to 29.5 million Euro.

The Economic Internal Rate of Return is equal to 4.7%.

Sensitivity analysis

The sensitivity analysis is focused on the identification of the "critical" variables of a project.

Tests have been carried out on investment and non routine maintenance costs and on expected demand.

For these variables, the switching values have been calculated. These are defined as the values of the considered variables for which the NPV is equal to zero. The following table provides the calculated switching values.

Table .26 Switching values for the Economic Net Present Value of the project

Variable	Switching value (%)
Construction and non routine maintenance costs	+27.1
Demand (TEU)	-23.1

References

Korzhenevych A., Dehnen N., Bröcker J., Holtkamp M., Meier H., Gibson G., Varma A., Cox V. (2014), *Update of the Handbook on External Costs of Transport*, Report for the European Commission: DG MOVE, online available at: http://ec.europa.eu/transport/themes/sustainable/studies/doc/2014-handbook-external-costs-transport.pdf

Financial Analysis

INDICE

1. INTRODUCTION

The financial analysis of a project is a method to determine the flows that are generated by an investment and represents an analysis tool of the conditions of feasibility of a project. The financial analysis, which informs the economic analysis, makes use of a set of information that derive from both the analysis of the demand and the technical feasibility assessment.

The key data for the financial analysis can be categories as follows:

- flows of total investment;
- flows of costs and revenues;
- funding sources.

The hypotheses on the size and the performance of these variables are expressed in the study of supply and demand in the technical feasibility study.

This document relates to the analysis of the economic and financial feasibility as well as to the elaboration of a draft Business Plan (hereinafter PEF) underlining the proposed intervention, which concerns the implementation of rail infrastructure adjustments related to the logistics node of the Port of Livorno.

The goal of the analysis is to set the total amount of the financial resources that are needed to support the investment operation, while trying to assess the financial capacity of the operation and its coverage of the financial needs. Therefore, it seeks to verify the feasibility of the intervention under scrutiny in terms of financial viability, whereas the financial feasibility of the project should be read as the ability to generate operating cash flows that are sufficient to guarantee at least the reimbursement of the loans activated.

The financial model developed is the result of a process that, starting from the current state of the operation, foresees future economic and financial forecasts.

The total investment of the operation was estimated at a total of more than € 200 million (€ 202,289,534).

Being an investment linked to the railway infrastructure, for which huge sums are needed and predictable revenues are somehow low – which corresponds to the overall profitability of the operation that is defined as low - it was decided to develop the analysis according to different scenarios:

- Scenario 1 "Profitability"
- Scenario 2 "Investment funds only national"
- Scenario 3 "Sustainability".

Scenario 1 considers that the managing body of the new infrastructure bears, at the same time, the burden for realizing the investment. In this case, the subject entitled will be FS-RFI (rail network national operator) in the network of which the interventions of the project are placed.

The model, albeit schematic, is used to evaluate the return on invested capital, verifying *a priori* the need for funding and quantifying the dimension. We then consider the overall cost of the works, the maintenance costs and the expected operating revenues.

In Scenario 2 key financial indicators are calculated, considering an investment supported by national funds in a proportion of 70%.

In Scenario 3, on the contrary, it is assumed a full coverage of the investment through funds of a public nature (CIPE, Tuscany Region) and considering EU co-financing as well.

In this case, the PEF is developed solely through the analysis of the revenues and the operating costs that will be incurred for operating and maintaining of the infrastructure. This is clearly a very different model: in this case the purpose is to only verify the sustainability of the operation. The development of the models has allowed the identification of the economic and financial situation of the managing body, synthesized through the tables of cash flows and forecasts, made on the basis of the assumptions used for the projections of the items of operational and financial revenues and costs.

2. GENERAL RECRUITMENT

This document uses information on monetary flows mainly derived from other documents prepared for the presentation of the project and organized in order to allow the verification of the financial sustainability.

2.1. Investment costs

Table 27 – Summary investment data

Investment		€ 202.289.534,93
Intervention A – Rail flyover "Tyrrhenian Line"		€ 16.981.328,42
Intervention B – Rail link Interporto Vespucci – rail line Pisa-Collesalvetti-Vada		€ 93.882.764,83
Intervention C – Rail link Pisa-Collesalvetti-Vada e Pisa-Firenze		€ 91.425.441,68

The total investment was estimated at € 202,289,534.

The two scenarios identified and developed in this analysis are different, since:

- in Scenario 1 "Profitability", this cost is considered allocated to the promoter / operator;
- in Scenario 2 "Investment only national funds", the return of the national capital that represents a partial coverage of construction costs (70%) is analysed;

- in Scenario 3 "Sustainability", it is assumed that the operation is totally funded by EU / CIPE / Tuscany Region (grants).

For the development of the calculations, the construction costs were divided into different annuity, considering a "trend" in the expenditure that is parallel to the progress of the work. At present, it is expected that project works will be completed by 2024.

2.2. Timetable

Table 28 - Timetable

	Start of work	Completion work
Intervention A - Rail overpass"Tyrrhenian Line"	2017	2019
Intervention B - Rail link Interporto Vespucci – rail line Pisa-Collesalvetti-Vada	2019	2022
Intervention C - Rail link Pisa-Collesalvetti-Vada e Pisa-Firenze	2020	2024

The time schedule, though schematic, it is useful to define, first, when the managing authority will start collecting the revenues from the new structures.

- Starting date of the PEF: 2016;
- Start Date interventions Int. A: 2017;
- Date of conclusion of Int. A: 2019
- Start Date operation Int. A: 2020;
- Start Date interventions Int. B: 2019;
- Date of conclusion of Int. B: 2022
- Start Date operation Int. B: 2023;
- Start Date interventions Int. C: 2020;
- Date of conclusion of Int. C: 2024
- Start Date operation Int. C: 2025;
- PEF Duration: 25 years after the conclusion of the works (up to 2049).

As shown in Table 2, a division of the works into three lots is put forth, with site preparation and completion of the work at different times. The realization of the works will occupy a period of time between 2017 and 2024 (8 annuities).

2.3. Maintenance costs

Maintenance costs – preliminarily defined by the designers and available in the attached documentation - will be borne by the operator.

Such costs have been schematically into works of routine maintenance (incurred annually) and special maintenance (supported with a timing differentiated according intervention).

The works of special maintenance refer to:

- Armament;
- Electric traction (primary power supply and contact line);
- Signalling.

We have estimated a special maintenance cost that amounts at approximately more than € 42 million and that is spread along the 25 years of operation. This very important cost (representing more than 20% of the total investment) is influenced by the characteristics of the line (length, arms, etc.) and, as it can be seen in the attached table related to Scenario 3 "Sustainability", these costs are particularly heavy in the third-last and in the last year considered. Considering the same time horizon, the amount of the ordinary maintenance has been calculated at about € 6.5 million and globally increases the cost of maintenance to approximately € 48.5 million.

This concentration in cost is due to the special maintenance interventions that have been planned in the design phase and is aimed at ensuring the extension of the useful life of the work which is estimated to level off at 90% of the original investment at the end of the twenty-fifth year (2049). Although not considered in the setting up of the scenario modeling, the managing body can evaluate the possibility to get access to financing instruments that allow a dilution for a period of time that is longer than the financial burden resulting from these interventions.

2.4. Residual value of the investment

When the actual economic life of a project exceeds the reference period, it is also appropriate to foresee a residual value, which will be assessed at the end of the management period and computed to the cash flows.

Being an infrastructure that - even with the constant investments in time that are expected – will certainly have a useful life longer than the 25 years that are set as time horizon for the grant, it is considered properly calculate the present value of net cash flows provided during the years of economic life outside the reference period (over 25 years) .This value is set to be equivalent to 90% of the initial investment at the twenty-fifth year of operation (2049).

The analysis that is presented in the following sections takes in account this value within the Profitability Scenario and the Investments funds only national Scenario. In the Sustainability Scenario, which is related to the financial stability of the operation, this value has, however, not been considered.

2.5. Transport demand, revenues

Income received by the operation depend on the number of rail transits that the new rail infrastructures allow to reach. Two different scenarios have been defined as a result of the preliminary investigations:

- Scenario "base growth" related to the forecasted number of container trains;
- Scenario "alternative" (number of trains increased – considering also the load of cars and semitrailers).

For the development of the calculations, while maintaining a perspective of precaution, we only used the data defined in the Scenario "base", which looks out only the flow of trains for the transport container. However, it must be emphasized that the transport analysis has highlighted in the Scenario "alternative" that the increase in demand is more than likely inherent to the flow of trains to transport cars and traffic Ro / Ro.

Income earned by the management simply derive from the number of rail passes.

Revenues = N. passages X tariff applied

The breakdown of the tariff applied to individual trains is given by:

- Charge to access the main network;
- Charge to access to the node;
- Price of the electric traction (per km);
- Charge for the use of the network (per km).

According to the assumptions made (estimated trains and distances), the managing body will perceive an annual turnover of between approximately € 600,000 and € 1.5 million.

3. THE ECONOMIC AND FINANCIAL PLAN

Below are the main assumptions used in the preparation of the cash flows. All values listed in the plan are stated net of VAT.

3.1. Time horizon

In view of the size and type of investment, the PEF is developed with a time horizon of 25 years (period of analysis). Considering the conclusion of the work by 2024, 2049 is set as the final year for the analysis.

3.2. Discount rate to discount cash flows

As known, the analysis of the cash flows involves the reconstruction of cash flows (the difference between the revenue and cash outflows) of a project over the period of analysis. Being a horizon so wide, the choice of the discount rate is of some importance: the discounting of cash flows is based on the use of the discount factor, in which the choice of the rate is crucial.

From an economic perspective, the rate of discounting reflects the opportunity cost of capital or, in other words, the yield at which the potential investor could theoretically renounce, using their own capital investments of similar risk.

In other words, the discount rate should reflect the opportunity cost of capital, i.e. the return on the best alternative project. Being an investment linked to an infrastructure, with very high construction costs, it is easy to predict that the financial profitability will be set at rather small levels (the expected profitability for adjustments rail is normally low).

We have chosen, in this case, using a discount rate of 5%, as recommended by the European Commission, which has indicated this parameter as an indicative benchmark for public investment projects co-financed by the Funds.

3.3. Depreciation

In developing the financial analysis the generated cash flows are considered, e.g. the actual amount of cash paid or received by the project. Depreciation and contingency reserves were not included as part of the financial analysis.

3.4. Sources of funding

The financing of the works object of this planned intervention is part of the Understanding General Framework between the Government and the Region of Tuscany signed in 2011, which identifies among the strategic works to be built in Tuscany precisely the rail link between the Port of Livorno, the inland port/logistic center of Guasticce and the Firenze node. This funding is made explicit in that agreement in its primary sources (CIPE Funds and Tuscany Region ERDF), which is a necessary integration that results from the European programming.

In Scenario 3 "Sustainability" a full coverage of the investment costs with grant is assumed. In calculating the financial profitability, the financial resources invested in the project are taken into account, but not the investment costs. Capital injections must be considered when they are actually paid for the project or reimbursed.

- Scenario 1 "Profitability": investment made directly by the operator;
- Scenario 2 "Investment funds only national": 70% national funds;
- Scenario 3 "Sustainability": total grant (State, Region, EU).

3.5 Interest expenditure

In Scenario 1 "Profitability", as mentioned earlier, it is assumed that the managing body directly supports the investments that necessary for the realization of the planned works and, therefore, that this value is

composed by equity and debt capital in a proportion of respectively 30% and 70%, on which the expenditure for interests is calculated (4% per year).

Within the Scenario 2 only considering national Investment funds the expenditure for interests is calculated on the share of the investment that is supported by national fund, e.g. approximately € 140 million

3.6. Profitability indicators

The financial viability of an investment is estimated in advance through the summary measures of performance:

- the financial net present value FNPV / C;
- the internal rate of return on investment IRR / C.

These indicators show how the net revenue allow to meet the investment costs, regardless of the way these are financed.

The Net Present Value (NPV) expresses the sum of the entries and exits updated through the use of a discount rate of reference. This measurement method is based on the principle that an initiative deserves to be considered if the benefits that may result exceeds the resources used.

The FNPV of the project is a monetary value expressed in currency and represents the profitability of the project: it has no book value, but expresses only the ability to generate returns on investment of less or greater than a reference threshold. In theory, the more the FNPV is high investment turns out to be more convenient.

The Internal Rate of Return (IRR) is the rate for which the NPV is zero. The IRR is the rate that indicates indifference to the project financial and separates intervals rates that suggest the operation convenient intervals for which the operation is disadvantageous.

The IRR is expressed as a percentage and in the projects business investment is compared with the cost of financing planned. For a public project may be desirable that the finding made at any rate minimum threshold previously defined. In the case in which IRR is less than this, the project may be discarded because it is not financially feasible. In general for projects financed with public funds and for great works do not expect a high rate of return of the project, could instead bring important economic benefits interventions characterized by negative IRR.

4. DEVELOPMENT OF CALCULATIONS

4.1. Scenario 1: "Profitability"

Scenario 1 measures the inherent profitability of the investment, regardless of the financial structure adopted. Cash flows have subsequently been calculated by considering:

- (-) investment costs
- (-) operating costs
- (+) revenues
- (+) residual value.

In this case, compared with a total investment of about € 200 million, the operator will collect revenue from rail traffic and will support the full cost maintenance.

- Subject: body implementer / manager
- Investment: supported entirely by the implementer / manager
- Hypothesis equity ratio: 30% (70% in debt)
- Analysis duration: 25 years after the conclusion of the works
- Passive interest rate financing: 4%
- Used discount rate: 5%
- Residual value (after 25 years): 90% initial investment
- Revenues generated by trains transits
- FNPV / C = -194mln of approximately €
- IRR / C = -2.94%

As shown in Table 5 (see Annexes), annual cash flows are always negative (with the exception of the last two annuities in which it is considered the residual value): in other words, the expected revenues are not able to cover the costs of investment and maintenance expected. A negative NPV - in this case - about € 194 million - corresponds to an operation for which the outputs are set to exceed revenue.

Precisely for this reason, given the strategic characteristics of that operation (as described on the impact that will have on the competitiveness of the Port and the logistic node of Livorno) and the socio-economic benefits quantified in the cost-benefit analysis, the stakeholders and the different levels of government agree on the need for achievement and voted positively on the financial viability of the operation. In such a scenario, however, compared to the results of the financial analysis the possibility of involving private capital in the construction and operation of the new infrastructure has been rejected as the latter one would not have ensured minimum levels of profitability necessary to stimulate the interest of the private actors.

4.2. Scenario 2: "Investment funds only national"

Scenario 2 is similar to the previous, but it assumes a coverage of the total investment of 70% of the total amounts.

- Subject: body implementer / manager

- Investment: 70% supported by national funding
- Analysis duration: 25 years after the conclusion of the works
- Passive interest rate financing: 4%
- Used discount rate: 5%
- Residual value (after 25 years): 90% initial investment
- Revenues generated by trains transits
- FNPV / K = -94mln of approximately €
- IRR / K = -1.34%

For the development of this scenario the financing of 70% of the resources needed to carry out the works is considered, originating from domestic sources (CIPE / Tuscany Region) and excluding the share of EU co-financing, subject to the application and the calculation of indicators leads to values slightly less negative than the previous.

4.3. Scenario 3: "Sustainability"

Given the low return on investment, it was assumed that the investment is covered entirely with a grant.

- Subject: managing body
- Investment: fully supported with a grant
- Investments relating to the works of extraordinary maintenance: incurred by the
- Analysis duration: 25 years after the conclusion of the works
- Used discount rate: 5%
- Passive interest rate financing: 4%
- Revenues generated by trains transits
- FNPV = + € 1.9 million approximately
- IRR = + 3.04%

The analysis of the cash flows related to the sole operation of the railway infrastructure shows a positive FNPV which totals indicatively € 0.1 million.

The IRR calculated, which is set at about 3%, is in line with the discount rate used to discount cash flows and suggests a fairly low profitability, even in surplus.

The huge maintenance costs estimated in the last years of the financial plan (the third to last and last) affect the positivity of the operation. Once more, it must be noted that, while maintaining a precautionary approach in the analytical perspective, the demand quantified within the baseline scenario has been investigated with only trains to transport container. It can be reasonably assumed that to this demand additional trains from transport cars and Ro / Ro will be added (see section Demand Analysis). As a consequence, revenues will increase and will improve the financial indicator.

4.4. Sensitivity analysis: increased costs and decreased revenues

In this section we report data on a simple sensitivity analysis performed by operating on two fundamental parameters of the financial analysis:

- the construction costs and maintenance;
- the revenues generated by rail passes.

The analysis was carried out by working on Scenario 3 "sustainability", where it is expected to complete coverage of investment realization through a grant.

Sensitivity analysis 1: ordinary and extraordinary maintenance costs are increased by 20%

- FNPV approximately € -0.8 million

Sensitivity analysis 2: Revenues decreased by 20%

- FNPV = -1.2 million € approximately

Although been studied by analysis of demand and by the contribution of the designers of infrastructure, it is clear that the expected rail flows and the expected maintenance and operation costs are the two variables that can affect more the financial viability of the operation.

In this respect, it is interesting to note that in both scenarios identified as a sensitivity analysis, the FNPV calculated is negative, indicating a substantial potential difficult sustainability of the infrastructure operation, in case there are the worse conditions referred to in this paragraph.

It is worth mentioning that the demand for transport has been kept only related to container trains and fixed as the fifteenth year (see the relevant annexes), in order to develop a scenario on the safe side, while it is entirely plausible that it undergoes constant changes in the upside.

CONCLUSIONS

This document has analyzed the financial feasibility of the project.

It has highlighted the low profitability of the operation, as entirely predictable since the railway works are characterized by very high construction costs and low revenues.

The profitability of the entire investment over 25 years, without considering the financial structure adopted (loans, grant, etc.), leads to a negative FNPV estimated at approximately -190 million €.

Since the amounts provided for the construction of the works amounted to approximately € 200 million, this means that the investment is not able to produce cash flows able to cover the costs of investment.

However, the analysis of the cash flows related to the sole operation, considering the investments covered by grant funding from various sources, shows the substantial sustainability, which generates revenues in line with the maintenance expenses and operation expectations.

The total investment is unable to finance itself and needs the use of a grant. It is noted, however, that the useful life of the works will exceed (much) the 25 years set for the analysis of cash flows, maintaining a more than appreciable residual value, fixed in the counts to 90% of the initial investment, which is in addition to what was mentioned about the benefits and impact that the project will produce in the intermodal and rail transport as well as in the local socio economic situation.

Table 29 - Financial Analysis: Scenario "Profitability" (part 1)

Year		2.016	2.017	2.018	2.019	2.020	2.021	2.022	2.023	2.024	2.025	2.026	2.027	2.028	2.029	2.030	2.031	2.032
Traffic revenues						610.823	610.823	610.823	1.188.293	1.212.543	1.236.794	1.261.045	1.285.296	1.309.547	1.333.798	1.358.049	1.372.257	1.386.465
Residual value																		
TOTAL REVENUES		0	0	0	0	**610.823**	**610.823**	**610.823**	**1.188.293**	**1.212.543**	**1.236.794**	**1.261.045**	**1.285.296**	**1.309.547**	**1.333.798**	**1.358.049**	**1.372.257**	**1.386.465**
Interest expenditure			-6.958.760	-6.859.422	-6.755.812	-6.647.747	-6.535.035	-6.417.476	-6.294.862	-6.166.976	-6.033.591	-5.894.471	-5.749.368	-5.598.026	-5.440.176	-5.275.538	-5.103.821	-4.924.721
TOTAL Financial Burden		0	**-6.958.760**	**-6.859.422**	**-6.755.812**	**-6.647.747**	**-6.535.035**	**-6.417.476**	**-6.294.862**	**-6.166.976**	**-6.033.591**	**-5.894.471**	**-5.749.368**	**-5.598.026**	**-5.440.176**	**-5.275.538**	**-5.103.821**	**-4.924.721**
Investment Costs																		
Works																		
WP1	Int. A		-5.660.443	-5.660.443	-5.660.443													
WP2.1	Int. B				-23.470.691	-23.470.691	-23.470.691	-23.470.691										
WP2.2	Int. C					-18.285.088	-18.285.088	-18.285.088	-18.285.088	-18.285.088								
Special maintenance																		
WP1	Int. A														-583.900			
WP2.1	Int. B												-840.000					-3.435.000
WP2.2	Int. C														-655.000			
TOTAL Investment costs		0	**-5.660.443**	**-5.660.443**	**-29.131.134**	**-41.755.780**	**-41.755.780**	**-41.755.780**	**-18.285.088**	**-18.285.088**	0	0	**-840.000**	0	**-1.238.900**	0	0	**-3.435.000**
Ordinary maintenance																		
WP1	Int. A					-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000
WP2.1	Int. B								-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000
WP2.2	Int. C										-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250
TOTAL Operation costs						***-16.000***	***-16.000***	***-16.000***	***-142.000***	***-142.000***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***
Cash Flow		0	**-12.619.203**	**-12.519.864**	**-35.886.946**	**-47.808.703**	**-47.695.991**	**-47.578.433**	**-23.533.658**	**-23.381.521**	**-5.043.047**	**-4.879.676**	**-5.550.322**	**-4.534.729**	**-5.591.528**	**-4.163.740**	**-3.977.815**	**-7.219.506**

Table 3 - Financial Analysis: Scenario "Profitability" (part 2)

Year		2.033	2.034	2.035	2.036	2.037	2.038	2.039	2.040	2.041	2.042	2.043	2.044	2.045	2.046	2.047	2.048	2.049
Traffic revenues		1.400.673	1.414.881	1.429.090	1.443.298	1.457.506	1.471.714	1.485.922	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131
Residual value																		182.060.581
TOTAL REVENUES		**1.400.673**	**1.414.881**	**1.429.090**	**1.443.298**	**1.457.506**	**1.471.714**	**1.485.922**	**1.500.131**	**1.500.131**	**1.500.131**	**1.500.131**	**1.500.131**	**1.500.131**	**1.500.131**	**1.500.131**	**1.500.131**	**183.560.712**
Interest expenditure		-4.737.919	-4.543.084	-4.339.872	-4.127.921	-3.906.857	-3.676.286	-3.435.802	-3.184.976	-2.923.365	-2.650.505	-2.365.911	-2.069.080	-1.759.486	-1.436.579	-1.099.787	-748.512	-382.133
TOTAL Financial Burden		**-4.737.919**	**-4.543.084**	**-4.339.872**	**-4.127.921**	**-3.906.857**	**-3.676.286**	**-3.435.802**	**-3.184.976**	**-2.923.365**	**-2.650.505**	**-2.365.911**	**-2.069.080**	**-1.759.486**	**-1.436.579**	**-1.099.787**	**-748.512**	**-382.133**
Investiment Costs																		
Works																		
WP1	Int. A																	
WP2.1	Int. B																	
WP2.2	Int. C																	
Special maintenance																		
WP1	Int. A							-583.900					-1.549.750					-583.900
WP2.1	Int. B					-840.000					-3.435.000					-13.019.650		
WP2.2	Int. C		-3.250.000					-655.000					-3.250.000					-9.480.150
TOTAL Investment costs		0	**-3.250.000**	0	0	**-840.000**	0	**-1.238.900**	0	0	**-3.435.000**	0	**-4.799.750**	0	0	**-13.019.650**	0	**-10.064.050**
Ordinary maintenance																		
WP1	Int. A	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000
WP2.1	Int. B	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000
WP2.2	Int. C	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250
TOTAL Operation costs		***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	**-246.250**	***-246.250***	***-246.250***	***-246.250***	***-246.250***
Cash Flow		**-3.583.495**	**-6.624.453**	**-3.157.032**	**-2.930.873**	**-3.535.601**	**-2.450.822**	**-3.435.029**	**-1.931.096**	**-1.669.484**	**-4.831.624**	**-1.112.031**	**-5.614.950**	**-505.605**	**-182.698**	**-12.865.556**	**505.368**	**172.868.279**

	Used discount rate		5%
Investment profitability	FNPV	-€ 194.149.150,76	on 25 years (completion works 2024, analysis until 2049)
	IRR/C (25 years)	-2,94%	

Table 30 - Financial Analysis: Scenario "Investment found only national" - 70% - (part 1)

Year		2.016	2.017	2.018	2.019	2.020	2.021	2.022	2.023	2.024	2.025	2.026	2.027	2.028	2.029	2.030	2.031	2.032	2.033	2.034
Traffic revenues						610.823	610.823	610.823	1.188.293	1.212.543	1.236.794	1.261.045	1.285.296	1.309.547	1.333.798	1.358.049	1.372.257	1.386.465	1.400.673	1.414.881
Residual value																				
TOTAL REVENUES		0	0	0	0	**610.823**	**610.823**	**610.823**	**1.188.293**	**1.212.543**	**1.236.794**	**1.261.045**	**1.285.296**	**1.309.547**	**1.333.798**	**1.358.049**	**1.372.257**	**1.386.465**	**1.400.673**	**1.414.881**
Interest expenditure			-1.217.783	-1.200.399	-1.182.267	-1.163.356	-1.143.631	-1.123.058	-1.101.601	-1.079.221	-1.055.879	-1.031.532	-1.006.139	-979.655	-952.031	-923.219	-893.169	-861.826	-829.136	-795.040
TOTAL Financial Burden		0	**-1.217.783**	**-1.200.399**	**-1.182.267**	**-1.163.356**	**-1.143.631**	**-1.123.058**	**-1.101.601**	**-1.079.221**	**-1.055.879**	**-1.031.532**	**-1.006.139**	**-979.655**	**-952.031**	**-923.219**	**-893.169**	**-861.826**	**-829.136**	**-795.040**
Investment costs (70% of investment)																				
Works																				
WP1	Int. A		-3.962.310	-3.962.310	-3.962.310															
WP2.1	Int. B				-16.429.484	-16.429.484	-16.429.484	-16.429.484												
WP2.2	Int. C					-12.799.562	-12.799.562	-12.799.562	-12.799.562	-12.799.562										
Special maintenance																				
WP1	Int. A														-583.900					
WP2.1	Int. B												-840.000					-3.435.000		
WP2.2	Int. C														-655.000					-3.250.000
TOTAL Investment costs		0	**-3.962.310**	**-3.962.310**	**-20.391.794**	**-29.229.046**	**-29.229.046**	**-29.229.046**	**-12.799.562**	**-12.799.562**	0	0	**-840.000**	0	**-1.238.900**	0	0	**-3.435.000**	0	**-3.250.000**
Ordinary maintenance																				
WP1	Int. A					-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000
WP2.1	Int. B								-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000
WP2.2	Int. C										-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250
TOTAL Operational costs						***-16.000***	***-16.000***	***-16.000***	***-142.000***	***-142.000***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***
Cash Flow		0	**-5.180.093**	**-5.162.709**	**-21.574.061**	**-29.797.578**	**-29.777.854**	**-29.757.281**	**-12.854.870**	**-12.808.239**	**-65.334**	**-16.737**	**-807.093**	**83.642**	**-1.103.383**	**188.579**	**232.838**	**-3.156.611**	**325.287**	**-2.876.408**

Table 4 - Financial Analysis: Scenario "Investment found only national" - 70% - (part 2)

Year		2.035	2.036	2.037	2.038	2.039	2.040	2.041	2.042	2.043	2.044	2.045	2.046	2.047	2.048	2.049
Traffic revenues		1.429.090	1.443.298	1.457.506	1.471.714	1.485.922	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131
Residual value																127.442.407
TOTAL REVENUES		**1.429.090**	**1.443.298**	**1.457.506**	**1.471.714**	**1.485.922**	**1.500.131**	**1.500.131**	**1.500.131**	**1.500.131**	**1.500.131**	**1.500.131**	**1.500.131**	**1.500.131**	**1.500.131**	**128.942.538**
Interest expenditure		-759.478	-722.386	-683.700	-643.350	-601.265	-557.371	-511.589	-463.838	-414.034	-362.089	-307.910	-251.401	-192.463	-130.990	-66.873
TOTAL Financial Burden		**-759.478**	**-722.386**	**-683.700**	**-643.350**	**-601.265**	**-557.371**	**-511.589**	**-463.838**	**-414.034**	**-362.089**	**-307.910**	**-251.401**	**-192.463**	**-130.990**	**-66.873**
Works																
WP1	Int. A															
WP2.1	Int. B															
WP2.2	Int. C															
Special maintenance																
WP1	Int. A					-583.900					-1.549.750					-583.900
WP2.1	Int. B			-840.000					-3.435.000					-13.019.650		
WP2.2	Int. C					-655.000					-3.250.000					-9.480.150
TOTAL Investment costs		0	0	**-840.000**	0	**-1.238.900**	0	0	**-3.435.000**	0	**-4.799.750**	0	0	**-13.019.650**	0	**-10.064.050**
Ordinary maintenance																
WP1	Int. A	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000
WP2.1	Int. B	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000
WP2.2	Int. C	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250
TOTAL Operational costs		***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***	***-246.250***
Cash Flow		**423.362**	**474.662**	**-312.444**	**582.114**	**-600.493**	**696.510**	**742.292**	**-2.644.958**	**839.846**	**-3.907.959**	**945.971**	**1.002.479**	**-11.958.232**	**1.122.891**	**118.565.364**

	Used discount rate	5%	
Investment profitability	FNPV	-€ 93.853.951,46	on 25 years (completion works 2024, analysis until 2049)
	IRR /K (25 anni)	-1,34%	

Table 31 - Financial Analysis: Scenario "Sustainability" (part 1)

Year			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Eu grant	30% inv.	60.686.860													
Regional grant	35% inv	70.801.337													
National grant	35% inv	70.801.337													
FINANCIAL RESOURCES		**202.289.535**	0	0	0	0	0	0	0	0	0	0	0	0	0
Traffic revenues															
WP1	Int. A														
WP2.1	Int. B														
WP2.2	Int. C														
TOTAL REVENUES MANANGING BODY			610.823	610.823	610.823	1.188.293	1.212.543	1.236.794	1.261.045	1.285.296	1.309.547	1.333.798	1.358.049	1.372.257	1.386.465
TOTAL INFLOWS			610.823	610.823	610.823	1.188.293	1.212.543	1.236.794	1.261.045	1.285.296	1.309.547	1.333.798	1.358.049	1.372.257	1.386.465
Special maintenance															
WP1	Int. A											-583.900			
WP2.1	Int. B									-840.000					-3.435.000
WP2.2	Int. C											-655.000			
TOTAL Investment costs			0	0	0	0	0	0	0	**-840.000**	0	**-1.238.900**	0	0	**-3.435.000**
Ordinary maintenance															
WP1	Int. A		-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000
WP2.1	Int. B					-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000
WP2.2	Int. C							-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250
TOTAL Operational costs			*-16.000*	*-16.000*	*-16.000*	*-142.000*	*-142.000*	*-246.250*	*-246.250*	*-246.250*	*-246.250*	*-246.250*	-246.250	*-246.250*	*-246.250*
TOTAL OUTFLOWS			-16.000	-16.000	-16.000	-142.000	-142.000	-246.250	-246.250	-1.086.250	-246.250	-1.485.150	-246.250	-246.250	-3.681.250
Net Cash Flow			594.823	594.823	594.823	1.046.293	1.070.543	990.544	1.014.795	199.046	1.063.297	-151.352	1.111.799	1.126.007	-2.294.785
Cumulated Cash Flow			594.823	1.189.646	1.784.469	2.830.762	3.901.305	4.891.849	5.906.645	6.105.691	7.168.988	7.017.635	8.129.434	9.255.441	6.960.656

Table 5 - Financial Analysis: Scenario "Sustainability" (part 2)

Year		2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
FINANCIAL RESOURCES		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Traffic revenues																		
WP1	Int. A																	
WP2.1	Int. B																	
WP2.2	Int. C																	
TOTAL REVENUES MANANGING BODY		1.400.673	1.414.881	1.429.090	1.443.298	1.457.506	1.471.714	1.485.922	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131
TOTAL INFLOWS		1.400.673	1.414.881	1.429.090	1.443.298	1.457.506	1.471.714	1.485.922	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131
Investiment Costs																		
Special maintenance																		
WP1	Int. A							-583.900					-1.549.750					-583.900
WP2.1	Int. B					-840.000					-3.435.000					-13.019.650		
WP2.2	Int. C		-3.250.000					-655.000					-3.250.000					-9.480.150
TOTAL Investment costs		0	**-3.250.000**	0	0	**-840.000**	0	**-1.238.900**	0	0	**-3.435.000**	0	**-4.799.750**	0	0	**-13.019.650**	0	**-10.064.050**
Ordinary maintenance																		
WP1	Int. A	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000
WP2.1	Int. B	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000
WP2.2	Int. C	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250
TOTAL Operational costs		*-246.250*	*-246.250*	*-246.250*	*-246.250*	*-246.250*	*-246.250*	*-246.250*	*-246.250*	*-246.250*	*-246.250*	*-246.250*	*-246.250*	-246.250	*-246.250*	*-246.250*	*-246.250*	*-246.250*
TOTAL OUTFLOWS		-246.250	-3.496.250	-246.250	-246.250	-1.086.250	-246.250	-1.485.150	-246.250	-246.250	-3.681.250	-246.250	-5.046.000	-246.250	-246.250	-13.265.900	-246.250	-10.310.300
Net Cash Flow		1.154.423	-2.081.369	1.182.840	1.197.048	371.256	1.225.464	772	1.253.881	1.253.881	-2.181.119	1.253.881	-3.545.869	1.253.881	1.253.881	-11.765.769	1.253.881	-8.810.169
Cumulated Cash Flow		8.115.079	6.033.710	7.216.550	8.413.598	8.784.854	10.010.318	10.011.090	11.264.971	12.518.852	10.337.732	11.591.613	8.045.743	9.299.624	10.553.504	-1.212.265	41.616	-8.768.554

Used discount rate	5%	
FNPV	1.905.526	*on 25 years (completion works 2024, analysis 2049)*
IRR /K (25 anni)	3,04%	

Table 32 – Sensitivity Analysis 1: costs + 20% (part 1)

Year		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Traffic revenues														
WP1	Int. A													
WP2.1	Int. B													
WP2.2	Int. C													
TOTAL REVENUES MANANGING BODY		610.823	610.823	610.823	1.188.293	1.212.543	1.236.794	1.261.045	1.285.296	1.309.547	1.333.798	1.358.049	1.372.257	1.386.465
TOTAL INFLOWS		610.823	610.823	610.823	1.188.293	1.212.543	1.236.794	1.261.045	1.285.296	1.309.547	1.333.798	1.358.049	1.372.257	1.386.465
Special maintenance														
WP1	Int. A										- 700.680			
WP2.1	Int. B								- 1.008.000					- 4.122.000
WP2.2	Int. C										- 786.000			
TOTAL Investment costs		0	0	0	0	0	0	0	**-1.008.000**	0	**-1.486.680**	0	0	**-4.122.000**
Ordinary maintenance														
WP1	Int. A	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200
WP2.1	Int. B				-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200
WP2.2	Int. C						-125.100	-125.100	-125.100	-125.100	-125.100	-125.100	-125.100	-125.100
TOTAL Operational costs		-19.200	-19.200	-19.200	-170.400	-170.400	-295.500	-295.500	-295.500	-295.500	-295.500	-295.500	-295.500	-295.500
TOTAL OUTFLOWS		-19.200	-19.200	-19.200	-170.400	-170.400	-295.500	-295.500	-1.303.500	-295.500	-1.782.180	-295.500	-295.500	-4.417.500
Net Cash Flow		591.623	591.623	591.623	1.017.893	1.042.143	941.294	965.545	-18.204	1.014.047	-448.382	1.062.549	1.076.757	-3.031.035
Cumulated Cash Flow		591.623	1.183.246	1.774.869	2.792.762	3.834.905	4.776.199	5.741.745	5.723.541	6.737.588	6.289.205	7.351.754	8.428.511	5.397.476

Table 6 – Sensitivity Analysis 1: costs + 20% (part 2)

Year		2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
Traffic revenues																		
WP1	Int. A																	
WP2.1	Int. B																	
WP2.2	Int. C																	
TOTAL REVENUES MANANGING BODY		1.400.673	1.414.881	1.429.090	1.443.298	1.457.506	1.471.714	1.485.922	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131
TOTAL INFLOWS		1.400.673	1.414.881	1.429.090	1.443.298	1.457.506	1.471.714	1.485.922	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131	1.500.131
Special maintenance																		
WP1	Int. A							- 700.680					- 1.859.700					- 700.680
WP2.1	Int. B					- 1.008.000					- 4.122.000					- 15.623.580		
WP2.2	Int. C		- 3.900.000					- 786.000					- 3.900.000					- 11.376.180
TOTAL Investment costs		0	**-3.900.000**	0	0	**-1.008.000**	0	**-1.486.680**	0	0	**-4.122.000**	0	**-5.759.700**	0	0	**-15.623.580**	0	**-12.076.860**
Ordinary maintenance																		
WP1	Int. A	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200	-19.200
WP2.1	Int. B	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200	-151.200
WP2.2	Int. C	-125.100	-125.100	-125.100	-125.100	-125.100	-125.100	-125.100	-125.100	-125.100	-125.100	-125.100	-125.100	-125.100	-125.100	-125.100	-125.100	-125.100
TOTAL Operational costs		-295.500	-295.500	-295.500	-295.500	-295.500	-295.500	-295.500	-295.500	-295.500	-295.500	-295.500	-295.500	-295.500	-295.500	-295.500	-295.500	-295.500
TOTAL OUTFLOWS		-295.500	-4.195.500	-295.500	-295.500	-1.303.500	-295.500	-1.782.180	-295.500	-295.500	-4.417.500	-295.500	-6.055.200	-295.500	-295.500	-15.919.080	-295.500	-12.372.360
Net Cash Flow		1.105.173	-2.780.619	1.133.590	1.147.798	154.006	1.176.214	-296.258	1.204.631	1.204.631	-2.917.369	1.204.631	-4.555.069	1.204.631	1.204.631	-14.418.949	1.204.631	-10.872.229
Cumulated Cash Flow		6.502.649	3.722.030	4.855.620	6.003.418	6.157.424	7.333.638	7.037.380	8.242.011	9.446.642	6.529.272	7.733.903	3.178.833	4.383.464	5.588.094	-8.830.855	-7.626.224	-18.498.454

Used discount rate 5%

FNPV -843.383 on 25 years (completion works 2024, analysis until 2049)

Table 33 – Sensitivity Analysis 1: revenues - 20% (part 1)

Year		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Traffic revenues														
WP1	Int. A													
WP2.1	Int. B													
WP2.2	Int. C													
TOTAL REVENUES MANANGING BODY		488.658	488.658	488.658	950.634	970.035	989.435	1.008.836	1.028.237	1.047.638	1.067.038	1.086.439	1.097.805	1.109.172
TOTAL INFLOWS		488.658	488.658	488.658	950.634	970.035	989.435	1.008.836	1.028.237	1.047.638	1.067.038	1.086.439	1.097.805	1.109.172
Special maintenance														
WP1	Int. A										- 583.900			
WP2.1	Int. B								- 840.000					- 3.435.000
WP2.2	Int. C										- 655.000			
TOTAL Investment costs		0	0	0	0	0	0	0	**-840.000**	0	**-1.238.900**	0	0	**-3.435.000**
Ordinary maintenance														
WP1	Int. A	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000
WP2.1	Int. B				-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000
WP2.2	Int. C						-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250
TOTAL Operational costs		-16.000	-16.000	-16.000	-142.000	-142.000	-246.250	-246.250	-246.250	-246.250	-246.250	-246.250	-246.250	-246.250
TOTAL OUTFLOWS		-16.000	-16.000	-16.000	-142.000	-142.000	-246.250	-246.250	-1.086.250	-246.250	-1.485.150	-246.250	-246.250	-3.681.250
Net Cash Flow		472.658	472.658	472.658	808.634	828.035	743.185	762.586	-58.013	801.388	-418.112	840.189	851.555	-2.572.078
Cumulated Cash Flow		472.658	945.317	1.417.975	2.226.609	3.054.644	3.797.830	4.560.416	4.502.402	5.303.790	4.885.678	5.725.867	6.577.423	4.005.345

Table 34 – Sensitivity Analysis 1: revenues - 20% (part 2)

Year		2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
Traffic revenues																		
WP1	Int. A																	
WP2.1	Int. B																	
WP2.2	Int. C																	
TOTAL REVENUES MANANGING BODY		1.120.539	1.131.905	1.143.272	1.154.638	1.166.005	1.177.371	1.188.738	1.200.104	1.200.104	1.200.104	1.200.104	1.200.104	1.200.104	1.200.104	1.200.104	1.200.104	1.200.104
TOTAL INFLOWS		1.120.539	1.131.905	1.143.272	1.154.638	1.166.005	1.177.371	1.188.738	1.200.104	1.200.104	1.200.104	1.200.104	1.200.104	1.200.104	1.200.104	1.200.104	1.200.104	1.200.104
Investiment Costs																		
Special maintenance																		
WP1	Int. A							- 583.900					- 1.549.750					- 583.900
WP2.1	Int. B					- 40.000					- 3.435.000					- 13.019.650		
WP2.2	Int. C		- .250.000					- 655.000					- .250.000					- 9.480.150
TOTAL Investment costs		0	**-3.250.000**	0	0	**-840.000**	0	**-1.238.900**	0	0	**-3.435.000**	0	**-4.799.750**	0	0	**-13.019.650**	0	**-10.064.050**
Ordinary maintenance																		
WP1	Int. A	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000	-16.000
WP2.1	Int. B	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000	-126.000
WP2.2	Int. C	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250	-104.250
TOTAL Operational costs		-246.250	-246.250	-246.250	-246.250	-246.250	-246.250	-246.250	-246.250	-246.250	-246.250	-246.250	-246.250	-246.250	-246.250	-246.250	-246.250	-246.250
TOTAL OUTFLOWS		-246.250	-3.496.250	-246.250	-246.250	-1.086.250	-246.250	-1.485.150	-246.250	-246.250	-3.681.250	-246.250	-5.046.000	-246.250	-246.250	-13.265.900	-246.250	-10.310.300
Net Cash Flow		874.289	-2.364.345	897.022	908.388	79.755	931.121	-296.412	953.854	953.854	-2.481.146	953.854	-3.845.896	953.854	953.854	-12.065.796	953.854	-9.110.196
Cumulated Cash Flow		4.879.633	2.515.288	3.412.310	4.320.698	4.400.453	5.331.574	5.035.162	5.989.017	6.942.871	4.461.726	5.415.580	1.569.685	2.523.539	3.477.394	-8.588.402	-7.634.548	-16.744.743
Used discount rate	5%																	
FNPV	-1.224.488	on 25 years (completion works 2024, analysis until 2049)																