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Environmental, Vulnerability & Social Feasibility
for the Construction, Equipment, Test &
Commissioning, Operation and Maintenance
under Works Concession with Public Service of
the Passenger Rapid Train in the Great
Metropolitan Area

Fourth Report: Economic and Financial Survey

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1 INTRODUCTION

This document is the second of the four documents that make up the fourth report of the Studies for the Technical, Economic-Financial, Environmental, Vulnerability & Social Feasibility for the Construction, Equipment, Test & Commissioning, Operation and Maintenance under Works Concession with Public Service of the Passenger Rapid Train in the Great Metropolitan Area.

This study consists of six reports:

- First Report: Work Plan.
- Second Report: Technical environmental, social, vulnerability assessment and gender studies.
- Third Report: Technical Feasibility Study.
- **Fourth Report: Economic and Financial Study.**
- Fifth Report: Financial Structuring and Document for the Bidding Process.
- Final Report.

Specifically, the objective of the economic-financial study is to bring together and analyze the elements necessary to evaluate and structure the proposal that would give the project the greatest economic-financial viability.

To this end, the Third Report: Technical Feasibility will be taken into account, as well as the fiscal contingencies for the analysis of the competent authorities.

Based on the cost estimates made, the overall impact of all the interventions that have been successful from the technical point of view is analyzed and the preliminary cost of the project will be assessed based on the technical feasibility made. This includes a unit price study and an element costing supported by the local experience of the consulting firm in the country.

For a correct understanding of the contents included in this report, it is distributed in six large sections according to the different typologies of economic-financial studies required by the project throughout the evaluation horizon.

These are:

- Cost-Benefit Analysis ("CBA")
- Risk analysis
- Value for money analysis
- Financial analysis at a conceptual level
- Technical and user fee analysis
- System integration analysis

In short, the Fourth Report: Economic and Financial Survey consists of four documents:

- Document 1: Economic and financial analysis.
- Document 2: Cost-Benefit Analysis.
- **Document 3: Risk Analysis and Value for Money.**
- Document 4: Technical Pricing and System Integration Analysis.

In the economic and financial analysis document, various alternative scenarios for remuneration and scope of the project have been put forward. Given this diversity of models, one of which must be selected for the bidding process, only one scenario has been evaluated for this analysis: the total development at the beginning of lines 1 to 5, both inclusive.

1.1 Project description

The GAM Electric Train consists of the development of a two-way railway system connecting the cities of Cartago, San José, Heredia and Alajuela. To do so, the intention is to take advantage of the existing route to promote the east-west connection of the GAM and to make this transport system the reference mode of public transport in the area, promoting sustainable mobility.

The proposed system covers a length of over 84 km with 46 stations along the route and is made up of 5 lines delimited by the INCOFER right-of-way. Lines 1 (Paraíso-Atlántico), 2 (Atlántico-Alajuela) and 3 (Atlántico-Ciruelas) will operate independently, while lines 4 (Alajuela-Ciruelas) and 5 (Ciruelas-El Coyol) are proposed as extensions of lines 2 and 3 respectively. There will also be four depots and a workshop with its corresponding administrative buildings. The Paraíso depot, located on Line 1, will be able to accommodate up to 20 trains, the Pacífico depot, which serves Line 3, will have a capacity for 24 trains and the Ciruelas depot, corresponding to Line 4, will have space for 12 trains. The Las Cañas depot, which is located on Line 2, apart from being able to accommodate 24 trains, will be in charge of carrying out the most complex maintenance tasks of the entire system since it will be the only one with a workshop.

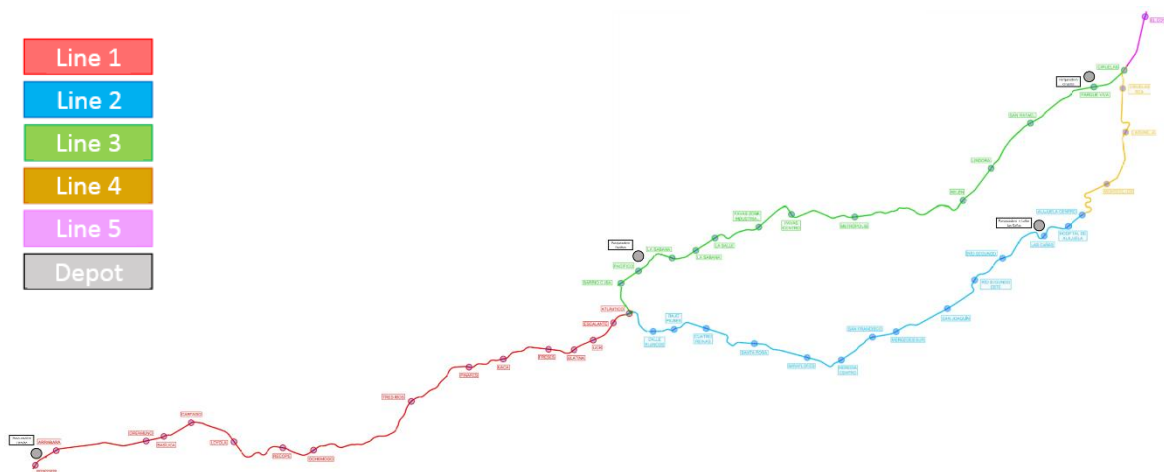


Figure 1. GAM Electric Train.

The stops that make up the GAM Electric Train can be seen in the following figure.



Figure 2. GAM Electric Train Stations.

In order to meet the demand, it is proposed to operate the 3 main lines (i.e. lines 1, 2 and 3) with frequencies of 5 minutes at peak time (15 minutes at off-peak time) and with frequencies of 10 minutes at peak time (30 minutes at off-peak time) for extensions on working days. On non-working days, weekends and public holidays, the frequencies are reduced to 10 minutes at peak time (20 minutes at off-peak time) and 20 minutes at peak time (40 minutes at off-peak time) for lines 1-2-3 and 4-5 respectively.

All of this is detailed in Chapter 21: Operation of the Third Report, with its corresponding technical justification.

	Start	Finish
Morning off-peak time	05:00	06:00
Morning rush hour	06:00	10:00
Midday off-peak time	10:00	15:30
Afternoon rush hour	15:30	19:30
Afternoon off-peak time	19:30	23:00

Table 1. Periods of variation in demand.

	Lines 1,2 and 3		Lines 4 and 5	
	Working	Nonworking	Working	Nonworking
Off-peak	15 minutes	20 minutes	30 minutes	40 minutes
Rush hour	5 minutes	10 minutes	10 minutes	20 minutes

Table 2. Operating frequencies in the lines as a function of time and day.

From the tariff point of view, each line will be charged independently with a base rate for the main lines and a reduced fare for extensions.

In order to meet the system's demand, with the frequencies explained, 78 trains are required (including maintenance and reserve trains) as detailed in Chapter 21: Operation and Maintenance of the Third Report, which will be 5-module electric traction light articulated trains in double composition. The capacity of this type of train ranges from 430 passengers (4 passengers/m²) to 600 passengers (6 passengers/m²) without exceeding a length of 70 m. However, given the length of the station platforms (80 m), if future demand so requires, the rolling stock could be adapted to the seven modules in order to increase its transport capacity.

In summary, the following table shows the main characteristics of each line.

	Layout	Length	Stations	Depots	Workshop
Line 1	Urban/Interurban	27,4 km	16	Paraíso/Pacífico	Las Cañas
Line 2	Urban/Interurban	21,6 km	15	Pacífico/Aeropuerto	Las Cañas
Line 3	Urban/Interurban	25,4 km	14	Pacífico/Ciruelas	Las Cañas
Line 4	Interurban	7,8 km	5	Ciruelas/Las Cañas	Las Cañas
Line 5	Interurban	2,7 km	2	Ciruelas	Las Cañas

Table 3. Main characteristics of the lines.

In addition, 14 of the stations mentioned are proposed as intermodal stations, where the transfer of passengers between the bus system and the Electric Train would take place.

The following is a summary of the main magnitudes and characteristics of the project in order to have a more appropriate idea of its dimension:

- Infrastructure: Track infrastructure, systems and rolling stock.
- Length of the route: 84.85 km.
- Number of stations: 46.
- Rolling stock required: 78 in the year of commissioning.
- Maximum speed: 25 km/h in urban areas, 50 km/h in semi-urban areas, and 70 km/h in interurban areas.
- Train frequency: 5 minutes during peak hours.
- Passenger transport capacity: 600 passengers per unit in a double train.

In short, the Electric Urban Train project consists of improving the current train that operates between San José de Costa Rica and the towns of Alajuela, Belén and Paraíso on three respective lines, along with the extension from Belén to Ciruelas and two new sections from Alajuela to Ciruelas and from Ciruelas to El Coyoil, respectively.

2 RISK ANALYSIS

The risk analysis is a fundamental stage of the process, specifically in the phase of structuring the management and contract model. Its fundamental objective is to identify the risks that may be generated throughout the life of the Project, their quantification and the assignment of each one of them to the most appropriate party.

Defects in this analysis may unnecessarily increase the cost of the project and, consequently, the cost of the services derived from it. In order to propose a project of these characteristics as viable through a Public-Private Partnership ("PPP") scheme, it is necessary to first determine the risks associated with the project, as well as their probability of occurrence and impact on the investment cost, the cost of risk transfer from the public to the private sector (Value for Money), and, finally, the economic-financial projections and cash flows derived from the investment and operation plans.

Generally, the risks to be assigned or distributed among the parties are classified in the following groups:

- Construction risks: those arising from cost overruns, delays in completion, construction defects, etc. In some cases, this usually includes risks of expropriation (acquisition of land or rights of way).
- Operating risks
 - Pay-per-use (PPU) scenario: operational risks derived from the degree of use or frequentation of the infrastructure (number of users). In this case, the private operator's revenues and profitability depend on the level of demand or traffic and applicable tariffs, without prejudice to the establishment of minimum guaranteed revenues.
 - Payment for Availability (PPD) scenario: operational risks derived from the quality of service and availability of the infrastructure for users. In this case, the private operator's income and profitability depend on the degree of compliance with a series of indicators (maintenance, cleanliness, punctuality).

- Other general risks: financing risks (interest rate, exchange rate, fund raising), technological risks, etc.

In this way, the identification of the risks of each phase, evaluating the impact of the same and its probability of occurrence, as well as the factors that could mitigate them, allows to generate a matrix of risks that includes the main challenges of the Project.

2.1 Risk matrix

The procedure for carrying out the risk analysis focuses on the so-called Risk Matrix. It consists of a double entry table in which the information relating to the different risks of the Project is included.

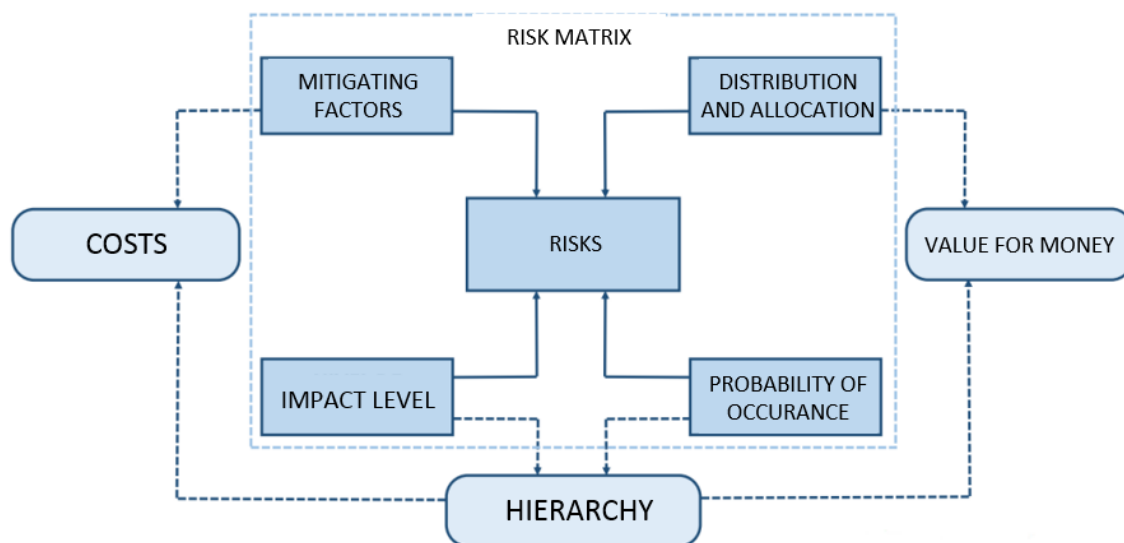


Figure 3. Risk matrix.

The objectives of this matrix will be, on the one hand, to make the project more attractive to developers, operators, investors and financiers, as well as to facilitate the bankability of the project and reduce costs as much as possible.

The information relating to the different risks of the Project is classified as follows:

- Risks identified
- Description of these risks
- Type of impact on the Project if the risk occurs
- Allocation and distribution of risks between the public partner and the private partner
- Potential impact of the risk if it occurs. It is quantified according to a percentage of probability and a percentage of amount to be applied on the amount of investment (CAPEX) or on the amount of operation costs (OPEX) or on the estimated value of the properties, if applicable.
- Mitigating factors for each risk.

2.2 Identification of risks by phases

On the other hand, the different risks identified, and the information detailed in the previous point are classified in the following stages of the Project:

- Preliminary stage
- Design phase
- Construction and start-up phase
- Exploitation phase
- General risks at all stages

From the information generated, the Risk Matrix is constructed, which will serve as the basis for the following phases of analysis:

- Comparative analysis of Value for Money.
- Financial viability study.
- Financial structuring.
- Preparation of contract documents (bidding poster, contract...).

2.3 Risks of the GAM Electric Train Project

2.3.1 Risks in the preliminary phase

The risks pertaining to the preliminary phase of the project are mainly focused on the right of way of the infrastructure and its holders, as well as aspects related to the route. The risks

identified in this phase, together with their potential impacts, are set out in the table presented below:

RISK	DESCRIPTION	TYPE OF IMPACT
Right of way	Impossibility of completely regularizing the right of way through which the line corresponding to the Project passes. This risk concerns mainly the lines 4 and 5, since the rest of the line exists and is operational.	Delays in part of the project, and even the impossibility of developing it.
Land	Change of the project route due to the impossibility of regularizing the right of way or acquiring the real estate necessary for the development of the project.	Increased costs in the realization of the project, given the need to modify the line.
Property Regularization	The contracting entity must have full rights over the properties through which the project line will pass, in order to exploit them for any purpose intended, in terms of the applicable laws.	Decrease in the level of expected income.
Acquisition of goods	The contracting entity must have ownership of the buildings through which the project line is planned to pass.	Increase in costs, delays and even impossibility of carrying out the project.
Social-Political	Project line that is invaded by settlements of people.	Increase of costs in the realization of the project, given the necessary compensations.

Table 4. Risks of the preliminary phase.

It is noted that the above-mentioned risks are of substantial importance and may even prevent the development of part of the Project.

2.3.2 Risks in the design phase

The risks in the design phase focus on possible cost increases arising from the need for modifications. The following table sets out the risks identified for this phase, as well as their potential impacts.

RISK	DESCRIPTION	TYPE OF IMPACT
Design Risk	Risk that the design fails to achieve the required output specifications, with the result that the project is more or less than necessary to meet demand requirements	Infrastructure not properly built. Cost overruns for rectifications or to be able to operate
Planning Risk	Risk that the proposed use of the project land will fail to comply with any applicable laws regarding planning, building, land use, etc.	Increased planning and approval costs and perhaps also design, construction and operation costs. Delayed service availability.
Functional Risk	Risk that during the design and construction phases, the need for some modification (e.g., additional linkage or connection) or changes to the project may arise to facilitate the functionality of the project	Increased costs
Geotechnical Risk	Risk that during the design phase the geotechnical studies have not been carried out correctly	Cost increase
Risk of obtaining permits and licenses	Risks that are produced by authorizations from public institutions other than the Administration and that must be obtained by the private partner before the start of the construction work. Among others, we can mention environmental licenses, deviation plans, service providers' permits for the necessary affectations (and the obligatory coordination with them), etc.	Increased planning and approval costs and perhaps also design, construction and operation costs. Delayed service availability.

Table 5. Risks in the design phase.

As shown in the table above, the risks cited generally involve potential increases in project costs, which can substantially affect both exploitation and financial viability.

2.3.3 Risks in the construction phase

The risks in the construction phase of the project are mainly focused on cost overruns and delays in implementation, as well as on the availability of land and means. The following table sets out the risks identified in this phase, together with their potential impacts.

RISK	DESCRIPTION	TYPE OF IMPACT
Existing infrastructure risk transferred to the private sector	Risks in the infrastructure of projects of expansion or improvement of existing infrastructures inherent to the quality of the same and the possible increase in the cost of investment, with respect to what was initially considered, whose situation leads to improvements necessary to reach the required standard.	Higher or unforeseen costs, interruption and delay in delivery or availability
Risk of availability (of human and material means)	Risk that human and/or material resources will not be available during the construction phase.	Costs, interruption and delay in delivery or provision
Completion risk (cost overrun for late completion)	Risk that construction works are not completed on the expected date of completion	Costs including price updates, loss of skills, delays, potential loss of income
Risk of implementation cost overruns	Risk that during the design and construction phase the actual cost of the project exceeds the budgeted costs	Increase in costs
Risk from additional investments	Once the final design has been approved by the Administration, any modification or addition that implies changes in the investment or in the works may imply an extra cost of the work or a longer period of time than those established.	Increased costs, delays in operation
Risk of latent defects	Risk of a latent defect appearing during the construction phase	Increased costs to remedy the defect and delay in the availability of the necessary means to remedy it
Rolling stock acquisition risk	Risk of rolling stock not being fully available as planned	Increased costs, delays in operation
Geotechnical risks	Risk of a problem on the land that is not known at the bidding stage and that appears during construction	Additional Costs
Destruction	Risk that infrastructure/equipment may be totally or partially destroyed due to damage	Costs incurred to repair or maintain the project Lack of availability of infrastructure / equipment
Risk of affected services	Risk that during the construction phase there are problems generated by other service and supply providers (gas, water, telecommunications,	Increased costs, delays in construction and completion

RISK	DESCRIPTION	TYPE OF IMPACT
	electricity...) and require relocation of cables and pipes	
Risk of impact on buildings and adjacent facilities	Risk of damage to property or facilities adjacent to the infrastructure during construction	Additional Costs
Infrastructure access risk	Risk of liability for damage to property or third parties (visitors, employees of the concessionaire...) in the infrastructure	Compensation to third parties damaged or whose property is damaged or destroyed during their presence on the infrastructure
Archaeological risk	Risks in findings of archaeological remains that generate the interruption of the normal development of the works according to the terms established in the contract or on costs in the execution of the same	Increased costs, delays in operation

Table 6. Risks in the Construction Phase.

It can be seen from the table above that the risks cited are of substantial importance and focus especially on potential cost increases and delays in project implementation. This would have adverse effects on the financial viability of the project.

2.3.4 Risks in the operational phase

Risks in the operational phase focus on operational aspects and regulatory or environmental risks.

RISK	DESCRIPTION	TYPE OF IMPACT
Demand risk	Risk of demand not reaching the estimated demand	Lower income
Risk of fee evasion by users	Risk that the expected revenue from the tariff will not be met because part of the demand does not result in payment of the tariff for reasons of evasion	Lower income

RISK	DESCRIPTION	TYPE OF IMPACT
Performance and service quality risk	Risk that the service provider does not meet the required specifications	Penalties, additional costs to ensure specifications (in case of payment for availability)
Risk of non-insurance coverage	(I) Possibility that the dealer is not insured, or (ii) Risk that cannot be insured because the premium to the dealer is too high and cannot be assumed	Costs caused by the occurrence of an uninsured event
Inflation risk	Inflation risk during the O&M phase	Cost increase
Operating risks	Other factors (other than Major Force) impacting the operational requirements of the project, including budgeted operating expense and capacity requirements (e.g., labor issues, employee skills, employee fraud, technology failure...)	Increased operating costs. Delayed or reduced project availability
Maintenance risk	Risk that maintenance will not be carried out in full or in a sufficient manner or due to poor quality of construction	Increased operating and/or maintenance costs
Regulatory / legislative risk	Risk of change in legislation or requirements	Cost increase
Political risk / risk of default	During the operation phase of the infrastructure, the private party is exposed to different measures or policies that the State may adopt in relation to preventing tariff revenues or commitments to which the Administration is, if applicable, obliged before the private partner	Reduction of project income. Lower net cash flow available
Tax rate risk	Risk that changes in applicable tax rates or new taxes will adversely affect the project	Increased project costs. Lower net cash flow available
Technological risk	Risk that technological improvements may lead to obsolescence	Increased costs to maintain or replace obsolete technology to meet agreed specifications
Services and supplies risk	Risk that the supply operators (e.g. electricity, telecommunications...) required for the operation of the project may not be available	Delays in construction and/or operation
Risk of energy tariff changes	Risk that the electricity operator will unilaterally change the tariff	Increased project costs. Lower net cash flow available
Public liability risk	Risk of liability for damages to third parties (visitors, employees of the concessionaire or the Administration...) in the infrastructure. Liability for property damage in the infrastructure	Any damage to third parties (persons or things) requiring compensation

RISK	DESCRIPTION	TYPE OF IMPACT
Risk of lack of security	Risk that the dealer may not be able to comply with the established safety requirements	Fines, cost increases, closure of infrastructure

Table 7. Risks of the exploitation phase.

As can be seen in the table above, these risks are relevant in terms of the potential loss of profitability and viability due to increased costs and, in turn, a reduction in income from availability.

2.3.5 General risks

The general risks are those inherent to all the phases of the project (construction and operation) and are mainly focused on the project environment. The following table sets out the risks identified in this phase together with their potential impacts.

RISK	DESCRIPTION	TYPE OF IMPACT
Currency exchange risk associated with payments to the dealer	Risk of adverse exchange rate fluctuations having an impact on revenues and, therefore, on the operating results of the concessionaire	Potential for lower dealer operating margin
Currency exchange risk associated with demand revenues	Risk of adverse exchange rate fluctuations having an impact on tariff revenues (due to depreciation of the local currency in which the tariffs are denominated) and, therefore, on the concessionaire's operating results	Potential for lower dealer operating margin
Currency exchange risk associated with OPEX / CAPEX of the dealer	Risk that exchange rate fluctuations will impact the cost of imported goods required for the construction or operating phases, or revenues if they are in a different currency than costs	Potential for lower dealer operating margin
Interest rate risk	Risk of upward fluctuation in the interest rate on the concessionaire's debt.	Cost increase
Financing risk	The financing risk consists of the impossibility of negotiating and signing a	Increased costs. Delays

RISK	DESCRIPTION	TYPE OF IMPACT
	project financing contract within the term of the contract.	
Insurance coverage risk	Possibility that: (i) a risk is not covered by the concessionaire, or (ii) a risk is uninsurable because of high premium costs	Costs generated by the occurrence of the uninsured event
Regulatory change risk	Possibility of variations in the regulations that affect the cash flows and profitability of the Project (accounting and tax regulations, variation in rates...)	Variation in income and profitability
Environmental risk	Risk of liability for losses caused by environmental damage generated by construction activity	Cost of repair, suspension of harmful activity, order of cessation of construction or operation by the authority Delay in construction or completion. Unbudgeted design change
Risk of early termination due to non-compliance or unilateral termination by the Administration	Risk of early termination of the contract or unilateral termination by the management	Potential bankruptcy or insolvency of the dealer
Risk of early termination due to private default	Risk that the private partner's performance is deficient or that he fails to meet his obligations and is therefore liable to termination of his contract	Rescue of the concession and search for a new operator, with the consequent effect on the service provided
Risk of early termination due to force majeure/insolvency of the builder or service provider	Risk of early termination of the contract due to force majeure	Rescue of the concession and search for a new operator, with the consequent effect on the service provided
Residual Value Risk	Risk that the project assets, at the end of the PPP contract, are not in the condition expected to be reversed (e.g., poor building materials may mean a shorter useful life and latent defects)	Increased costs. Delays

Table 8. General risks.

As shown in the table above, the risks cited are very diverse and may involve delays in operation and adverse variation in the operating margin of the Project, generating adverse situations in its viability.

2.4 Distribution of retained and transferred risks

Observations regarding the different risk groups and their possible distribution between the public partner and the private partner are presented below.

2.4.1 Risks in the preliminary phase

The table below shows the distribution of risks in the previous phase of the project.

RISK	RISK SHARING		REGULAR ASSIGNMENT
	S. PRIVATE	S. PUBLIC	
Right of way	10%	90%	This risk must be borne by the institution promoting the project; in any case, establish a maximum amount to be borne by the private partner.
Land	0%	100%	This risk must be borne by the institution promoting the project.
Property Regularization	0%	100%	This risk must be borne by the institution promoting the project; in any case, establish a maximum amount to be borne by the private partner.
Acquisition of goods	0%	100%	This risk must be borne by the institution promoting the project; in any case, establish a maximum amount to be borne by the private partner.
Social-Political	0%	100%	This risk, at the beginning, must be borne by the institution promoting the project. Part of the risk may be transferred to the private partner.

Table 9. Distribution of risks of the previous phase.

It is noted that generally most of the risks in the pre-project phase are assigned to the public partner, given the complexity of the management of such risks by the private partner and

the potential adverse effects on the development of the project, as well as the strong linkage of these risks with the legislative environment.

2.4.2 Risks in the design phase

The usual distribution of risks in the project design phase is presented below.

RISK	RISK SHARING		REGULAR ASSIGNMENT
	S. PRIVATE	S. PUBLIC	
Design Risk	100%	0%	This risk must be borne by the party responsible for the design of the project
Planning Risk	50%	50%	This risk must be borne by the party responsible for the design and planning of the project
Functional Risk	75%	25%	This risk must be borne by the party responsible for the design of the project
Geotechnical Risk	100%	0%	In PPP this risk is normally shared, but must be borne by the party in charge of the geotechnical study
Risk of obtaining permits and licenses	50%	50%	This risk must be borne by the party responsible for the design and planning of the project, which is sometimes shared

Table 10. Risk distribution in the design phase.

As can be seen, the risks in this category are generally shared between the public partner and the private partner, although the latter has a more relevant role in managing these risks in order to adapt the infrastructure to its subsequent construction and operation.

2.4.3 Risks in the construction phase

The distribution of risks in the construction phase of the project usually takes into account the following observations regarding risk allocation.

RISK	RISK SHARING		REGULAR ASSIGNMENT
	S. PRIVATE	S. PUBLIC	
Existing infrastructure risk transferred to the private sector	100%	0%	In PPP this risk is usually transferred to the private partner as part of the construction risk. In traditional financing, it is retained by the government
Risk of availability (of human and material means)	100%	0%	In PPP this risk is usually transferred to the private partner as part of the construction risk. However, it is necessary to take into account social risks that do not allow the development of the project (blockades, demonstrations, etc.), in which, for their mitigation and elimination, the State must intervene.
Completion risk (cost overrun for late completion)	100%	0%	In the budget contract, the risk of completion is shared since in many cases the builder must pay compensation for delay. In PPP, 100% is assigned to the private partner
Risk of implementation cost overruns	100%	0%	In a budget contract, the risk of cost overrun is shared. In PPP, 100% is assigned to the private partner
Risk from additional investments	50%	50%	This risk is shared, depending on whether it is a question of increases in work required by the Administration or by the private partner
Risk of latent defects	100%	0%	In budget contracts, the risk of termination is shared since in many cases the builder must pay compensation for delay. In PPP, 100% is assigned to the private partner.
Rolling stock acquisition risk	100%	0%	In PPP this risk is normally transferred to the private partner as part of the operation risk
Geotechnical risks	100%	0%	In PPP, it is usually shared, but must be supported by the party responsible for the geotechnical analysis
Destruction	100%	0%	This risk is not shared: in budget contracts it is managed by the Administration and in PPPs it is managed by the private partner, except in exceptional cases (force majeure...)
Risk of affected services	100%	0%	In the budget contract it is normally shared, but it is mostly assigned to the public partner, while in PPP it is 100% risk of the private partner being part of the construction contract

RISK	RISK SHARING		REGULAR ASSIGNMENT
	S. PRIVATE	S. PUBLIC	
Risk of impact on buildings and adjacent facilities	100%	0%	In PPP this risk is normally transferred to the private partner as part of the construction risk
Infrastructure access risk	100%	0%	In PPP this risk is normally transferred to the private partner as part of the O&M risk
Archaeological risk	100%	0%	In PPP, it is usually shared, but must be supported by the party responsible for the geotechnical analysis

Table 11. Risk distribution in the construction phase.

As shown in the table above, most of the risks associated with this category are assigned to the private partner, with some risks being assigned to the public partner and others being shared.

The objective within a public-private partnership is for the private partner to take control of the construction, since it will be the one who will subsequently have to operate and maintain the infrastructure and service.

2.4.4 Risks in the operational phase

The distribution of risks in the operational phase usually takes into account the following observations regarding their allocation:

RISK	RISK SHARING		REGULAR ASSIGNMENT
	S. PRIVATE	S. PUBLIC	
Demand risk (PPU scenario)	100%	0%	If a minimum guaranteed demand were set, the risk would remain assigned to the private partner, although the amount would be lower.
Risk of tariff evasion by users (PPU/PPD Scenario)	100%/0%	0%/100%	In case of establishing a compensation, the risk is assigned to the Administration. Otherwise, it is borne by the private partner. In the case of PPP, it is assigned to the private partner.
Performance and quality of service risk (PPD scenario)	100%	0%	The transfer of risk will depend on the assigned risk (demand or availability). In cases where quality and availability levels are required, if they

RISK	RISK SHARING		REGULAR ASSIGNMENT
	S. PRIVATE	S. PUBLIC	
			are not met, there are deductions in the payment to the private partner.
Risk of non-insurance coverage	100%	0%	There are various insurance policies to be taken out by the private partner, but the risks are distributed and shared between the private and public partners, depending on the event
Inflation risk	100%	0%	The inflation risk is assigned to the private partner and will affect the evolution of tariffs, which are usually linked to the inflation rate.
Operating risks	100%	0%	This risk is not shared: if it is a budgetary or traditional contract it is managed by the Administration, unless it has a management contract with an operator; and if it is a PPP, it is managed by the private partner
Maintenance risk	100%	0%	This risk is not shared: if it is a budgetary contract, it is managed by the Administration and if it is a PPP, it is managed by the private partner
Regulatory / legislative risk	50%	50%	If it is a budgetary contract, the risk is retained by the Administration and if it is a PPP, it is shared between the two parties, but with a greater allocation to the private one, especially the risk of tariffs
Political risk / risk of default	100%	0%	This risk is not shared: if it is a budgetary contract, it is assigned to the Administration and if it is a PPP, it is assigned to the private partner
Tax rate risk	0%	100%	This risk is usually assigned to the private partner in PPP (Income Tax, VAT...). In this case, the private partner does not have to pay Income Tax and the project as a whole will be exempt from VAT.
Technological risk	100%	0%	At risk is usually assigned to the private partner in PPP.
Services and supplies risk	100%	0%	In PPP most of these risks are assigned to the private partner, who will sign long term supply contracts with the service operators
Risk of energy tariff changes	0%	100%	In PPP, most of these risks are assigned to the private partner, who will sign long-term supply contracts with the service operators. In this

RISK	RISK SHARING		REGULAR ASSIGNMENT
	S. PRIVATE	S. PUBLIC	
			project, the cost of the energy will be established, and the private partner will not have this risk.
Public liability risk	100%	0%	This risk is not shared: if it is a budgetary contract, it is managed by the Administration and if it is a PPP, it is managed by the private partner
Risk of lack of security	100%	0%	This risk is not shared: if it is a budgetary contract, it is managed by the Administration and if it is a PPP, it is managed by the private partner

Table 12. Distribution of operating phase risks.

As can be seen from the table above, most of the risks of the operating phase are assigned to the private partner, except for a few specific risks assigned to the public partner and a number of risks that are shared.

The objective is for the private partner to manage the operation and maintenance so that it can have greater control over operating revenues and expenses.

2.4.5 General risks

The usual risk allocation for general risks is given below.

RISK	RISK SHARING		REGULAR ASSIGNMENT
	S. PRIVATE	S. PUBLIC	
Currency exchange risk associated with payments to the dealer	0%	100%	The risk is borne by the Administration.
Currency exchange rate risk associated with demand revenues (PPU/PPD Scenario)	PPU: 50% / PPD: 0%	PPU: 50% / PPD: 100%	In the PPU Scenario, the currency risk is shared as it is not guaranteed by the excess over the guaranteed minimum income. In the PPD, it is supported by the Administration.
Currency exchange risk associated with OPEX / CAPEX of the dealer	50%	50%	This risk is shared since there are costs denominated in local currency that the private partner must face, as well as the collection of part of the income in foreign currency.
Interest rate risk	100%	0%	In PPP, the risks related to financing are transferred to the private partner

RISK	RISK SHARING		REGULAR ASSIGNMENT
	S. PRIVATE	S. PUBLIC	
Financing risk	100%	0%	In PPP, the risks related to the financing are transferred to the private partner
Insurance coverage risk	100%	0%	There are several insurance policies to be taken out by the private partner but the risks must be distributed between him and the public partner on a case by case basis
Regulatory change risk	50%	50%	In PPP, part of these risks are transferred to the private partner while in Public Works they are retained by the Administration
Environmental risk	100%	0%	This risk must be borne by the private partner as part of its commitment in the budget contract, while it is not fully allocated in PPP
Risk of early termination due to non-compliance by the Administration or unilateral termination	100%	0%	This risk is assigned to the private partner in PPP, although he is entitled to compensation, which is generally regulated contractually and in accordance with the applicable regulations.
Risk of early termination due to private default	100%	0%	This risk is borne by the private partner as part of its commitment, both in the budget contract and in the PPP contract
Risk of early termination due to force majeure/insolvency of the builder or service provider	100%	0%	This risk is borne by the private partner as part of its commitment, both in the budget contract and in the PPP contract
Residual Value Risk	100%	0%	In PPP, the concessionaire will revert the assets to the Administration and in some cases there is a reserve amount generated by the concessionaire to adjust the infrastructure at the end of the contract

Table 13. Distribution of general risks.

It is noted that, in the general risk category, most risks are assigned to the private partner. The aim is for the private partner to manage as far as possible the development of the life of the PPP contract.

2.5 Risk mitigating factors

The usual mitigating factors for each of the risks identified in each of the project phases are set out below. The objective of these mitigating factors is:

- Minimize the likelihood of such risks
- Reduce the potential cost generated in the event of a risk

The mitigating factors are then broken down for each of the project phases, based on the risks identified above.

2.5.1 Risks in the preliminary phase

The mitigating factors for the risks identified in the pre-project phase are those included in the following table:

RISK	MITIGATING FACTORS
Right of way	Study and, where appropriate, regularization of the goods and rights that make up the right of way.
Land	Obtaining the necessary rights to be able to fully dispose of the land (or portion of land) through which the line passes.
Property Regularization	The legal areas involved in structuring the project must take all necessary actions to ensure that the project land can be used for the proposed purpose, in accordance with applicable laws.
Acquisition of goods	Alternative layouts, the acquisition of the land through which the right-of-way will pass (expropriation or sale).
Social-Political	Take past experiences in order to determine the optimal way to conduct the negotiation with the persons settled on the right of way.

Table 14. Risk mitigating factors of the previous phase.

2.5.2 Risks in the design phase

The mitigating factors for the risks considered in the project design phase are presented below:

RISK	MITIGATING FACTORS
Design Risk	Quality project carried out by an experienced company
Planning Risk	Correct legal and administrative analysis of the properties. Adequate processing. That the legal areas participating in the structuring of the project carry out all the necessary actions so that the project's properties can be used for the proposed purpose, in accordance with the applicable laws
Functional Risk	Quality project carried out by an experienced company. Administrative processing capacity. Legal provisions on economic-financial rebalancing that provide legal certainty to the parties. Studies.
Geotechnical Risk	Quality project carried out by an experienced company. Administrative processing capacity. Legal provisions on economic-financial rebalancing that provide legal certainty to the parties. Studies
Risk of obtaining permits and licenses	Correct legal and administrative analysis of the properties. Adequate processing. That the legal areas involved in the structuring of the project take all necessary actions to ensure that the land and other project assets can be used for the proposed purpose and within the time limit, in accordance with applicable laws.

Table 15. Mitigating factors for design phase risks

2.5.3 Risks in the construction phase

The mitigating factors for the risks considered in the construction phase of the project are presented below.

RISK	MITIGATING FACTORS
Existing infrastructure risk transferred to the private sector	Correct project planning. Clear assignment of responsibilities in the legal instruments that allow to define the resources that each part contributes to the project and the moment in which these resources must be contributed. Provide for penalties that discourage non-compliance by any of the parties.
Risk of availability (of human and material means)	Correct planning of the project. Clear assignment of responsibilities in the legal instruments that allow the definition of the resources that each party contributes to the project and the moment in which these resources must be contributed. Provide for penalties that discourage non-compliance by any of the parties.
Completion risk (cost overrun for late completion)	Generally, there is a turnkey contract, so the term is not exceeded in approximately 75% of the cases. Legal provisions on economic-financial rebalancing that provide legal certainty to the parties.

RISK	MITIGATING FACTORS
Risk of implementation cost overruns	Turnkey contracts. The legal instruments must provide for the allocation of these risks between the parties, as well as the scope of such allocation (degree of responsibility and penalties or exclusion of responsibility, as the case may be).
Risk from additional investments	Quality project carried out by an experienced company. Potential compensation from the Administration regulated by contract.
Risk of latent defects	Quality project carried out by an experienced company. Insurance policy. Forecast in terms of liability and penalties, since the risk has a high level of probability of occurrence.
Rolling stock acquisition risk	Adequate planning, contact with suppliers from the beginning of the project, service standards
Geotechnical risks	Geotechnical quality study. Insurance policy. Legal provisions on economic-financial rebalancing that provide legal certainty to the parties
Destruction	Insurance policies. Government guarantees. Clear compensation scheme and clear forecasts regarding the occurrence of fortuitous events and force majeure, as well as procedures for updating events of this nature
Risk of affected services	Quality project carried out by an experienced company. Administrative processing capacity. Legal provisions on economic-financial rebalancing that provide legal certainty to the parties.
Risk of impact on buildings and adjacent facilities	Legal and administrative processing and management capacity. Insurance policy
Infrastructure access risk	Insurance policy
Archaeological risk	Insurance policy

Table 16. Risk mitigating factors of the construction phase.

2.5.4 Risks of the exploitation phase

The mitigating factors for the risks considered in the operational phase of the project are presented below:

RISK	MITIGATING FACTORS
Demand risk (PPU scenario)	Rigorous demand study. Adequate rate structure with different levels. Minimum revenue guaranteed by the Government.
Risk of fee evasion by users	Adequate tariff collection system. Insurance policies

RISK	MITIGATING FACTORS
Performance and quality of service risk (PPD scenario)	Proven and experienced suppliers, operators and contractors. Guarantees. Rigorous payment mechanism so that defaults are objectively and correctly passed on to payment deductions.
Risk of non-insurance coverage	Insurance policies. Include in the legal documents provisions that establish that the responsible party is the one who has to contract sufficient insurance to cover the risk, otherwise it will be the only one responsible for the updating of the incident.
Inflation risk	Products derived from inflation rate coverage. Define a clear expropriation procedure, in terms of the applicable legislation. Legal provisions on economic-financial rebalancing that provide legal certainty to the parties.
Operating risks	Operating and management contracts with expert companies
Maintenance risk	Proven and experienced suppliers, operators and contractors.
Regulatory / legislative risk	Guarantees
Political risk / risk of default	Guarantees. Clear distinction in legal documents between changes in legislation that can be considered force majeure events and those that cannot.
Tax rate risk	Guarantees
Technological risk	Government guarantee. Exclusion in the legal documents, in relation to the possibility of considering force majeure events changes in tax rates (it is not common that they are considered as force majeure events).
Services and supplies risk	Adequate study and technical project. Selection of the most appropriate technologies. Establish forecasts, in the corresponding documents, regarding the possible need to modernize equipment and infrastructure, given the technological changes. Clear and viable terms and conditions for such modernization.
Risk of energy tariff changes	Long-term supply contracts with private operators. Possibility of contracting such services with competitors in the event of failures or insufficiencies in the provision of services.
Public liability risk	Supply contract with rate-setting agreement. Legal provision establishing the applicable tariff.
Risk of lack of security	Amount limited with a maximum or mitigated by insurance policies. Responsibility for restitution within a given period, otherwise, stipulation of conventional penalties.

Table 17. Risk mitigating factors of the operational phase.

2.5.5 General risks

The mitigating factors for risks considered to be general to all phases of the project are presented below:

RISK	MITIGATING FACTORS
Currency exchange risk associated with payments to the dealer	Provide in the PPP contract the possibility of taking financial positions, such as risk mitigation and distribution, for example, a currency swap contract, as long as the terms and conditions of such contracts are approved by the contracting institution, so that aggressive positions that go beyond a hedge and imply an additional risk to the development of the project are not taken.
Currency exchange risk associated with demand revenues	Provide in the PPP contract the possibility of taking financial positions, such as risk mitigation and distribution, for example, a currency swap contract, as long as the terms and conditions of such contracts are approved by the contracting institution, so that aggressive positions that go beyond a hedge and that imply an additional risk to the development of the project are not taken.
Currency exchange risk associated with OPEX / CAPEX of the dealer	Provide in the PPP contract the possibility of taking financial positions, such as risk mitigation and distribution, for example, a currency swap contract, as long as the terms and conditions of such contracts are approved by the contracting institution, so that aggressive positions that go beyond a hedge and that imply an additional risk to the development of the project are not taken.
Interest rate risk	Provide in the PPP contract the possibility of taking financial positions, such as risk mitigation and distribution, for example, an interest rate swap contract, as long as the terms and conditions of such contracts are approved by the contracting institution, so that aggressive positions that go beyond a coverage and that imply an additional risk to the development of the project are not taken.
Financing risk	Pre-financing agreements. Market survey during the feasibility study phase to adapt the analysis to potential financial conditions.
Insurance coverage risk	Insurance policies with sufficient scope, based on similar projects.
Regulatory change risk	Insurance policies with sufficient scope, based on similar projects.
Environmental risk	Insurance policies and a clear allocation of environmental responsibility, in order to establish conventional penalties or remediation obligations for the party in breach.
Risk of early termination due to non-compliance by the Administration or unilateral termination	Contractual regulation

RISK	MITIGATING FACTORS
Risk of early termination due to private default	Contractual regulation
Risk of early termination due to force majeure/insolvency of the builder or service provider	Contractual regulation
Residual Value Risk	Proven and experienced suppliers, operators and contractors. Guarantees. Insurance policies

Table 18. Factors mitigating general risks.

2.6 Analysis of the main risks

Finally, the main aspects of the fundamental risks associated with the Project are described, either because of their greater probability of occurrence or because of their high potential impact on costs.

2.6.1
Previous risks

RISK	DESCRIPTION	TYPE OF IMPACT	RISK SHARING		RISK SHARING	PROBABILITY	QUANTITY	MITIGATING FACTORS
			S. PRIVATE	S. PUBLIC				
Right of way	Impossibility of completely regularizing the right of way through which the line corresponding to the Project passes. This risk concerns mainly the lines 4 and 5, since most of the rest of the line exists and is operational.	Delays in the project, and even the impossibility of developing it.	10%	90%	This risk must be borne by the institution promoting the project, if necessary, by setting a maximum amount to be borne by the private partner.	30%	20%	Study and, where appropriate, regularization of the goods and rights that make up the right of way.

Table 19. Analysis of previous risks.

2.6.2
Design risks

RISK	DESCRIPTION	TYPE OF IMPACT	RISK SHARING		RISK SHARING	PROBABILITY	QUANTITY	MITIGATING FACTORS
			S. PRIVATE	S. PUBLIC				
Designer	Risk that the design fails to achieve the required output specifications, with the result that the project has more or less capacity than necessary to meet the needs of the demand.	Infrastructure not properly built. Cost overruns for rectifications or to be able to operate and even potential delays in start-up.	100%	0%	This risk must be borne by the party responsible for the design of the project	10%	10%	Quality project carried out by an experienced company.

Table 20. Design risk analysis.

2.6.3 Construction risks

RISK	DESCRIPTION	TYPE OF IMPACT	RISK SHARING		RISK SHARING	PROBABILITY	QUANTITY	MITIGATING FACTORS
			S. PRIVATE	S. PUBLIC				
Risk of implementation cost overruns	Risk that during the design and construction phase the real cost of the Project exceeds the budgeted costs, due to the increase in the cost of inputs and/or means of production with respect to the estimate of the same.	Increase in overall costs and, consequently, need for increased resources to finance investments. Such financial resources, if not provided for, could lead to the paralysis of the project or delays in the project and its implementation.	100%	0%	In budget contracts, the risk of termination is usually assumed by the government unless it applies penalties to the builder. In PPP, 100% is assigned to the private partner.	90%	20%	There is usually a turnkey contract, so the term is not exceeded in most cases in PPP contracts. In traditional financing there is an average cost overrun of around 20% in Costa Rica.
Completion risk (cost overrun for late completion)	Risk that construction work will not be completed by the expected date of completion	Costs including price updates, loss of skills, delays, potential loss of income	100%	0%	In budget contracts, the risk of termination is usually assumed by the government unless it applies penalties to the builder. In PPP, 100% is assigned to the private partner	90%	20%	There is usually a turnkey contract, so the term is not exceeded in most cases in PPP contracts. In traditional financing there is an average cost overrun of around 20% in Costa Rica.
Risk from additional investments	Once the final design is approved by the Administration, any modification or addition that implies modifications in the investment or in the works may imply an over cost of work or a longer period of time than those established.	Increased costs, delays in operation	100%	0%	This risk must be borne by the party responsible for the design of the project	20%	5%	Quality project carried out by an experienced company. Potential compensation from the Administration regulated by contract
Rolling stock procurement risk	Risk that rolling stock is not fully available as planned	Increased costs, delays in operation	100%	0%	In PPP this risk is normally transferred to the private partner as part of the operational risk	25%	50%	Adequate planning, contact with suppliers from the beginning of the project, service standards.
Services affected	Risk that during the construction phase there are problems generated by other service and supply providers and require relocation of connections, cables and pipes.	Increased costs, delays in construction and completion	100%	0%	In the budget contract it is normally shared, but it is mostly assigned to the public partner, while in PPP it is 100% risk of the private partner being part of the construction contract.	20%	20%	Quality project carried out by an experienced company. Administrative processing capacity. Legal provisions on economic-financial rebalancing that provide legal certainty to the parties.

Table 21. Analysis of construction risks.

2.6.4 Operating risks

RISK	DESCRIPTION	TYPE OF IMPACT	RISK SHARING		RISK SHARING	PROBABILITY	QUANTITY	MITIGATING FACTORS
			S. PRIVATE	S. PUBLIC				
Demand Risk (PPU Scenario)	Risk that the demand for travelers does not reach the estimated demand during the analysis phase. These may be generated by factors external to the private partner if actions are taken by the Government or the Municipality that may affect demand with a new supply of transport services, for example; or they may be caused by the private partner if it does not carry out an adequate commercial policy or a service in adequate conditions	Reduction in estimated income. In case of minimum guaranteed income, although the risk remains assigned to the private partner, the eventual amount would be lower.	100%	0%	The transfer of risk will depend on the combination of risks assigned (zero in availability). In some cases, quality and availability are required and, if they are not met, there are deductions.	60%	30%	Adequate tariff structure with different levels and establishment of minimum threshold
Performance and Quality of Service (PPD Scenario)	Risk that the service provider does not meet the specifications.	Penalties, additional costs to ensure specifications (in case of availability payment).	70%	30%	Risk transfer will depend on the assigned risk (may be zero or partial in PPU Scenario). In some cases, quality and availability are required and, if there is non-compliance, there are deductions.	40%	20%	Proven and experienced suppliers, operators and contractors. Conventional guarantees and penalties. Financial institutions generally prefer that the private partner have their income based on these variables rather than on demand, as these are factors that can be better managed.
Operation	Other factors (apart from Force Majeure) impacting on the operational requirements of the Project, including budgeted operating expenses and capacity requirements (e.g., labor issues, employee skills, employee fraud, technology failure...)	Increase in operating costs, negatively affecting the project's profitability and its ability to repay the subscribed debt. Less availability of the Project, either because it is delayed in time or because it is reduced due to a lower service offer.	100%	0%	This risk is not shared: if it is a budget contract it is managed by the Government, unless it has a management contract with a private operator, and if it is a PPP, it is managed by the private partner.	40%	10%	Operation and management contracts with expert companies. Insurance contracts.
Variations in energy tariffs	Risk that the electricity operator will unilaterally change the tariff	Increase in project costs. Lower net cash flow available.	0%	100%	In PPP these risks are assigned to the private partner, which will sign long-term supply contracts with the service operators, although in this case the energy tariff is expected to be established and fixed, which in practice means that the risk, although transferred to the private partner, is not quantified in the analysis.	0%	25%	Supply contract with rate-setting agreement.

Table 22. Analysis of operating risks.

2.6.5 General risks

RISK	DESCRIPTION	TYPE OF IMPACT	RISK SHARING		RISK SHARING	PROBABILITY	QUANTITY	MITIGATING FACTORS
			S. PRIVATE	S. PUBLIC				
Currency exchange risk associated with payments to the dealer	Risk of adverse exchange rate fluctuations having an impact on revenues and, therefore, on the operating results of the concessionaire	Potential for lower dealer operating margin	0%	100%	The risk is borne by the Administration.	100%	10%	Currency swap contract, as long as the terms and conditions of such contracts are approved by the contracting institution, so that aggressive positions that go beyond a hedge are not taken and that imply an additional risk to the development of the Project. In the case of the TRP, currency risk is partly mitigated by the combination of local currency and USD revenues and expenditures between the private partner and the intervening parties.
Currency exchange rate risk associated with demand revenues (PPU/PPD Scenario)	Risk of adverse exchange rate fluctuations having an impact on tariff revenues (due to depreciation of the local currency in which the tariffs are denominated) and, therefore, on the concessionaire's operating results	Potential for lower dealer operating margin	50%/0%	50%/100%	In the PPU Scenario, the currency risk is shared as it is not guaranteed by the minimum guaranteed income. In the PPD, it is supported by the Administration.	100%	10%	Currency swap contract, as long as the terms and conditions of such contracts are approved by the contracting institution, so that aggressive positions are not taken that go beyond a hedge and that imply an additional risk to the development of the Project. In the case of the TRP, currency risk is partly mitigated by the combination of local currency and USD revenues and expenditures between the private partner and the intervening parties.
Currency exchange risk associated with OPEX / CAPEX of the dealer	Risk that exchange rate fluctuations will impact the cost of imported goods required for the construction or operating phases, or revenues if they are in a different currency than costs	Potential for lower dealer operating margin	50%	50%	This risk is shared since there are costs denominated in local currency that the private partner must face, as well as the collection of part of the income in foreign currency.	100%	10%	Currency swap contract, as long as the terms and conditions of such contracts are approved by the contracting institution, so that aggressive positions are not taken that go beyond a hedge and that imply an additional risk to the development of the Project. In the case of the TRP, currency risk is partly mitigated by the combination of local currency and USD revenues and expenditures between the private partner and the intervening parties.

Table 23. Analysis of general risks.

3 VALUE FOR MONEY

Public infrastructure and equipment projects can be developed and financed in many different ways, while their services can be provided through different contractual structures. Thus, as regards their financing, this can be of two main types:

- Budgetary or Traditional Financing ("FT"), which is the traditional financing of the contracting of such public infrastructures and which is usually contemplated in contracts of the Design-Build type.
- Extra-budgetary financing, which corresponds to the majority of Public-Private Partnership ("PPP") contracts.

In the process of analysis and previous studies such as the one we are dealing with; it is important that public administrations or governments require a comparative analysis of which of the two routes (FT or PPP) is more convenient. For this purpose, the "Value for Money" ("VfM") methodology is used in many countries. The objective of VfM is to obtain the maximum benefit from the available resources; that is, to spend less, to spend well and to spend intelligently by governments.

3.1 Methodology and working procedure

The VfM basically consists of comparing through a series of criteria which of the two types of financing/contract (FT or PPP) is more convenient for the development and operation of public infrastructure. These criteria can be grouped mainly into three categories:

- Total Project Costs ("TPC"): this category includes all the estimated costs of the Project for a homogeneous FT modality period equal to that considered for the PPP contract, so that the results of both models are comparable.
Thus, the following cost items are added: construction, financial and other initial expenses for the implementation of the infrastructure, ordinary and extraordinary maintenance and conservation, replacement of facilities and equipment, and operating expenses.

- Costs arising from retained project risks ("RRC"): this category includes the estimated amount of costs arising from the potential risks inherent in a project in all its phases (design, construction, financing and operation).

Taking into account that, depending on the type of contract (FT or PPP), there is a different distribution of risks between the public partner and the private partner, and that these risks may involve certain costs (extra costs of execution, delays, design failures, financial costs, etc.), the RRCs for each type of contract must be considered according to the risks assigned to each of the parties. Logically, in a PPP there is a much higher allocation of risks to the private partner and, therefore, the RRCs retained by the public partner are estimated to be much lower than in the case of development through FT.

- Qualitative Criteria ("QC"): Regardless of the costs cited (TPC and RRC), there are additional factors that may establish the option of developing the infrastructure through a PPP as preferable to a FT. These factors can be the lack of budgetary resources, the unification of all contracts, the greater speed of contracting and development, etc. Therefore, independently of the sum of quantitative criteria (costs plus retained risks), there are other criteria that may have a particular impact on the decision criteria of the model to be developed. Even in certain cases, the CC could be decisive in selecting the most convenient option.

The methodological procedure of Vfm has the following considerations:

- The calculation of the TPCs is carried out in both alternatives (FT and PPP). It is usual that the higher financing costs of the private partner, the fiscal aspects, the required profitability, etc. may imply that the TPCs are higher in the cases of PPPs, although in many occasions their higher efficiency may allow savings in such TPCs.
- An identification is made of the project's risks in its different phases, as well as the potential cost of these risks, the probability of their occurrence, and the part to which each one is assigned (between the private partner and the Administration).
- The cost of these RCCs is estimated in both alternatives as described above. The fact that more risks are assigned to the private partner in a PPP means that the risks retained by the public partner (Government) are lower and therefore the amount of the RRCs for the Government is lower in the case of a PPP. It should be noted that in the case of the PPD option the demand risk is retained by the public sector.

- The TPCs and RRCs for each of the two parties to the contract in both alternatives are aggregated and the total aggregate cost (including retained risks) of both is compared.

In conclusion, although it is possible that the amount of the TPCs may be lower in the FT than in the PPP, the amount of the RRCs is usually much lower in the PPPs (because of the transfer of such costs to the private partner), so that many times the VfM generates more favorable results to the PPPs and, therefore, it could be advisable to carry out this Project through a PPP contract.

3.2 Project cost analysis

3.2.1 Total project costs

The project costs are classified in the following chapters:

- Initial investment costs (CAPEX)
- Replacement costs of facilities and equipment
- Operating expenses (OPEX)
- Financial Costs
- Income user fee
- Availability payment costs

Taking into account the development of the different cost and expense concepts during the whole contract term, their total value must be analyzed taking into account the time factor. Therefore, all cost and expense flows should be considered in constant value, aggregated at the date of the beginning of the analysis, without taking into account inflation.

The following tables show the TPCs of both alternatives (PPP vs. FT), broken down in the chapters indicated, for each of the scenarios (PPD and PPU):

PPD - BASIC CONTRACT RESULTS	FT	PPP
Initial investment costs (CAPEX)	1.838.351.287	0
Replacement costs of facilities and equipment	200.093.670	0
Operating expenses (OPEX)	1.371.062.666	0
Financial Costs	634.264.481	0
Income User fee	-2.298.489.737	
Net Government Payments ¹		2.224.009.163
Total project cost (constant USD with VAT)	1.745.282.366	2.224.009.163

Table 24. PPD Scenario - Comparison of TPC in the Value for Money analysis

PPU - RESULTADOS BÁSICOS DEL CONTRATO	FT	PPP
Initial investment costs (CAPEX)	1.793.357.723	0
Replacement costs of facilities and equipment	200.093.670	0
Operating expenses (OPEX)	1.371.062.666	0
Financial Costs	625.286.014	0
Income User fee	-2.298.489.737	
Net Government Payments ¹		2.794.782.534
Total project cost (constant USD with VAT)	1.691.310.336	2.794.782.534

Table 25. PPU Scenario - CTP Comparison in Value for Money Analysis

As shown in the table above, the first conclusions can be drawn, referring to the TPCs:

- Initial investment costs (CAPEX): This chapter on costs is the responsibility of the government in the case of the FT alternative, while in the case of PPPs it is the private partner that bears these costs.

¹ Net of income tax amount.

- Replacement costs of facilities and equipment: As with the previous one, in the case of PPPs it is the private partner who bears these costs, while in the FT alternative it would be the Government.
- Operating costs (OPEX): As in the previous cases, it is the Government that bears these costs in the FT alternative, while in the PPP case it is the private partner that bears them.
- Financial costs: Similarly, the financial costs are an item for which the Government is responsible in the case of France Télécom, whereas they are the responsibility of the private partner in the PPP alternative².
- Income User fee: This is the income generated by the payment of the fee by the captured demand.
- Net Government Payments: In the PPU Scenario this amount represents the complement to the User Fee payable by the Government to the private partner, as the fee revenues do not reach the break-even point. In the PPD Scenario, this amount represents the periodic payments made by the Government as an availability fee. As can be seen, this is higher in the PPU Scenario since the higher risk of this scenario requires a higher rate of return (IRR). In both scenarios, the amount of the Government Payments is calculated net of the amount of Corporate Tax that the Government will receive from the concessionaire.

In summary, it can be seen that the TPCs are higher in the case of PPPs than in the FT model in both scenarios analyzed, reaching a greater difference in the case of PPUs.

² According to the financing contract between CABEL and the Government of Costa Rica, in its Section 2.01: "The Borrower, through the Executing Agency, will grant the Project, for which it will use the resources of the Loan as the state counterpart of the concession. Therefore, it could be considered that, if the project is not developed through PPPs, the CABEL loan would not have the favorable financial conditions it has. However, in Section 2.02 it says "The funds from this Contract shall be used by the Borrower exclusively for the partial financing of the national counterpart for the execution of the Project briefly described", which does not prevent that, if the TRP project is developed, the funds may be used. In view of the uncertainty of such statements, and in a position of prudence, our understanding is that the same amounts of financial costs should be considered for both contractual alternatives. In any case, if it were finally considered that such financial conditions of the loan would only be applicable in the case of development of the project through PPP, the financial costs of the project would be significantly higher in the case of Traditional Financing, increasing the result in favor of the PPP alternative, which would result in the convenience of developing the project through this concessional scheme

3.2.2 Cost of retained risks

The RRCs are derived from the quantification of risks according to their probability of occurrence and potential amount, as set out in the Risk Analysis chapter.

Based on these quantified risks and their distribution and assignment between the public and private partners, an estimate has been made of the costs corresponding to the risks retained by the Public Administration or Government as well as those costs transferred to the private partner as a result of the structuring of the PPP contract.

The following table shows the RRCs of both alternatives (PPP vs. FT) for both scenarios analyzed, broken down into the different phases of the contract as described in the section corresponding to the Risk Matrix. In this case, the estimated cost of retained risks is the same for FT for both scenarios, except for OPEX risks (in particular, in the case of demand and availability risks), since the allocation and distribution of risks between public and private partners are different and therefore their costs are also:

PPD - COSTS OF RETAINED RISKS	FT	PPP
Preliminary Risks	9.919.794	9.523.002
CAPEX risks	1.015.733.561	405.972.791
Design	77.698.142	5.827.361
Construction	635.789.648	7.769.814
General	302.245.772	392.375.616
OPEX risks	763.872.079	473.046.211
Cost of risks retained by management (USD)	1.789.525.434	888.542.004

Table 26. PPD Scenario - Comparison of CRR in Value for Money analysis

PPU - COSTS OF RETAINED RISKS	FT	PPP
Preliminary Risks	9.919.794	9.523.002
CAPEX risks	1.015.733.561	328.274.649
Design	77.698.142	5.827.361
Construction	635.789.648	7.769.814
General	302.245.772	314.677.475
OPEX risks	763.872.079	91.175.667
Cost of risks retained by management (USD)	1.789.525.434	428.973.319

Table 27. PPU Scenario - Comparison of CRR in Value for Money analysis

As shown in the tables above, the first conclusions can be drawn, referring to the RRCs:

- Previous risks: This group is relevant, as it could even lead to the abandonment of the Project. This group generally depends on legal considerations, and to avoid such legal risks, they are transferred to a lesser extent to the private partner in case of PPP contract, although an allocation to the private partner is usually made by determining a maximum amount. Therefore, the RRCs for the Government in case of PPPs decrease with respect to FT, although not as drastically as other chapters.
- Design risks: As explained in the section on Risk Analysis, this group is a high cost factor and is generally transferred largely to the private partner in the case of a PPP contract. Therefore, the RRCs for the Government in case of PPPs decrease substantially.
- Construction risks: This is generally the most relevant group. They are usually transferred totally or largely to the private partner in the case of a PPP contract.
- General risks: This group is a high cost factor depending on the execution budget, which is the basis of calculation, and are mostly transferred to the private partner in case of PPP contract. Therefore, the RRCs for the Government in case of PPPs decrease substantially.
- Operating risks: This last group is the one that differs in the two scenarios analyzed, the difference between the RRCs in the PPP scenario being less, since the most relevant risk, that of demand, is only borne by the private partner, and not in its entirety, in the PPU Scenario.

In summary, it can be seen that the RRCs are substantially lower in the case of PPPs than in the FT model for both scenarios, the difference being much greater in the case of PPUs.

3.2.3 Total contract costs

Based on the two detailed concepts (TCC and RCC), a comparative analysis of the total contract costs (TCC) in both alternatives (PPP and FT) is carried out in order to calculate which of them may be more advantageous for the Government from the point of view of the quantitative criteria of the MV analysis.

The following table shows the total Project costs for both alternatives (PPP vs. FT) and for both scenarios (PPD and PPU):

PPD - BASIC SCENARIO RESULTS	FT	PPP
Total project cost	1.745.282.366	2.224.009.163
Cost of risks retained by the Administration	1.789.525.434	888.542.004
Value for Money	3.534.807.800	3.112.551.167

Table 28. PPD Scenario - Comparison of TCC of the contract in Value for Money analysis.

PPU - BASIC SCENARIO RESULTS	FT	PPP
Total project cost	1.691.310.336	2.794.782.534
Cost of risks retained by the Administration	1.789.525.434	428.973.319
Value for Money	3.480.835.770	3.223.755.853

Table 29. PPU Scenario - Comparison of TCC of the contract in Value for Money analysis

In summary, it can be seen that the Total Contract Costs ("TCC") are lower in the case of PPP compared to the FT model, with a more accentuated difference in the PPD scenario.

3.2.4 Quality criteria

Although VfM is mainly carried out on the basis of the quantitative criteria described above, a number of qualitative criteria must also be taken into account, which in certain public bodies may be decisive when choosing one structure or another.

Among these criteria, we can highlight the following:

- Availability of own material and human resources: In the case of FT, a greater number and quantity of own means are generally required to follow up the contract than in the case of PPP. A project of the magnitude and nature of the Passenger Rapid Train implies the need to have means that may not be available, which would result in delays in the development phase of the Project.
- Mitigation of uncertainty and numerous risks and contract amendments: Although the quantitative criteria take into account the costs of retained risks, the difficulties generated by such risks and possible contractual amendments during the life of the contracts (construction and operation) must also be considered in the FT.
- Lack of budgetary capacity to undertake the investments by means of budgetary or traditional financing. In these cases, projects with such high amounts of CAPEX as that of the Passenger Express Train may make it difficult to implement and finance them within a reasonable period of time if they are carried out by means of France Télécom, so that recourse must be had to PPP schemes.

3.3 Value for money analysis

3.3.1 Overall results of the VfM

As a result of the above, the following results are obtained from the comparative analysis of the Project's TCCs and RRCs:

- The TPCs are higher in the case of PPP than in the FT model in both scenarios analyzed, reaching a greater difference in the PPU scenario.
- The RRCs are substantially lower in the case of PPP versus the FT model in both scenarios.
- Combining both chapters, there is an important difference in the TCC in favor of the PPP model versus the FT model in both scenarios, with a greater emphasis on the case of PPD.

Apart from other possible qualitative criteria of weight, the above three aspects result in the recommendation of the VfM from the quantitative point of view, emphasizing the advantages of the PPP over the FT in both scenarios.

3.3.2 Potential VfM savings ratio

The ratio of potential savings of VfM, calculated as the differential cost between PPP and FT with respect to the total cost of FT, represents the value in relative terms of the potential savings that would be generated by developing the Project by PPP with respect to FT.

The results generated for the Passenger Rapid Train for each of the scenarios analyzed are as follows:

$$PPD - \text{Potential savings (\%)} = \frac{3.534.807.800 - 3.112.551.167}{3.534.807.800} \times 100 = 11,95\%$$

$$PPU - \text{Potential savings (\%)} = \frac{3.480.835.770 - 3.223.755.853}{3.480.835.770} \times 100 = 7,39\%$$

3.3.3 Comparison with other international projects

As a final analysis of the VfM process, a comparison has been made with other international light rail ("LRT" or "Light Rail Transit") or urban rail projects.

At the time of writing this study, there is not enough public information available on the analysis of VfM of similar projects to allow conclusive observations to be made.

However, the following information is available for the above-mentioned projects:

- Project 1: Guatemala MetroRiel
- Project 2: Evergreen Line, British Columbia, Canada
- Project 3: Valley Line, Edmonton, Canada
- Project 4: Bahrain Urban Transport Network, Bahrain

PARAMETER	PROJECT 1	PROJECT 2	PROJECT 3	PROJECT 4
FT (MM USD)	1.916	1.330	2.746	3.359
PPP (MM USD)	1.720	1.196	2.172	3.007
Cost Differential (MM USD)	197	134	574	352
Savings Potential (%)	10%	10%	21%	10%

Table 30. Comparison of Value for Money results in similar projects

As shown, the results generated for the Passenger Rapid Train in the PPU scenario are lower than the average of the exposed projects, while the PPD scenario obtains potential savings in line with the high band of the exposed international projects.

3.3.4 Conclusions

As conclusions derived from the comparative analysis - quantitative and qualitative - of the VfM, the following are drawn:

- The TCCs are higher in the case of FT versus the PPP model, in both PPD and PPU scenarios, and reaching a greater difference in the PPU scenario.
- RRCs are substantially lower in the case of PPP versus the FT model in both scenarios.

- The aggregation of TCCs and RRCs, as quantitative criteria, are lower in the case of PPP versus the FT model in both scenarios.
- According to the above-mentioned quantitative criteria, the analysis of VfM recommends to carry out the Project by means of a PPP contract, both for the PPD and the PPU scenarios.
- Taking into account the described qualitative criteria, the analysis emphasizes the recommendation to carry out the Project through a PPP contract.
- In conclusion, the VfM analysis carried out recommends carrying out the Project through a PPP contract.

3.4 Proposed contract structure

As a result of the Value for Money analysis described in the previous points, it has been considered more reasonable and adequate for the interests of the Public Administration promoters that the Project be developed through a PPP contract.

The contractual articulation is based on a PPP scheme with the following considerations:

- The Project would be developed through a Specific Purpose Partnership ("SPP").
- Revenues for the Rapid Passenger Train System are estimated to be based on a combination of user fee revenues (with minimum guaranteed revenues) and an availability fee, consisting of a fixed periodic amount made by the Government, which covers all costs and expenses of the Project, and which is subject to payment deductions if agreed standards of service quality and infrastructure availability are not met.
- Eventually, revenues derived from commercial activities by third parties (advertising, real estate leases...) could be considered as complementary revenues.
- Investments would be made in both currencies: Colons for infrastructure with local resources, and USD for the import of equipment and rolling stock.

The following figure describes the possible structure considered as adequate for the development of the Project from the operational point of view:

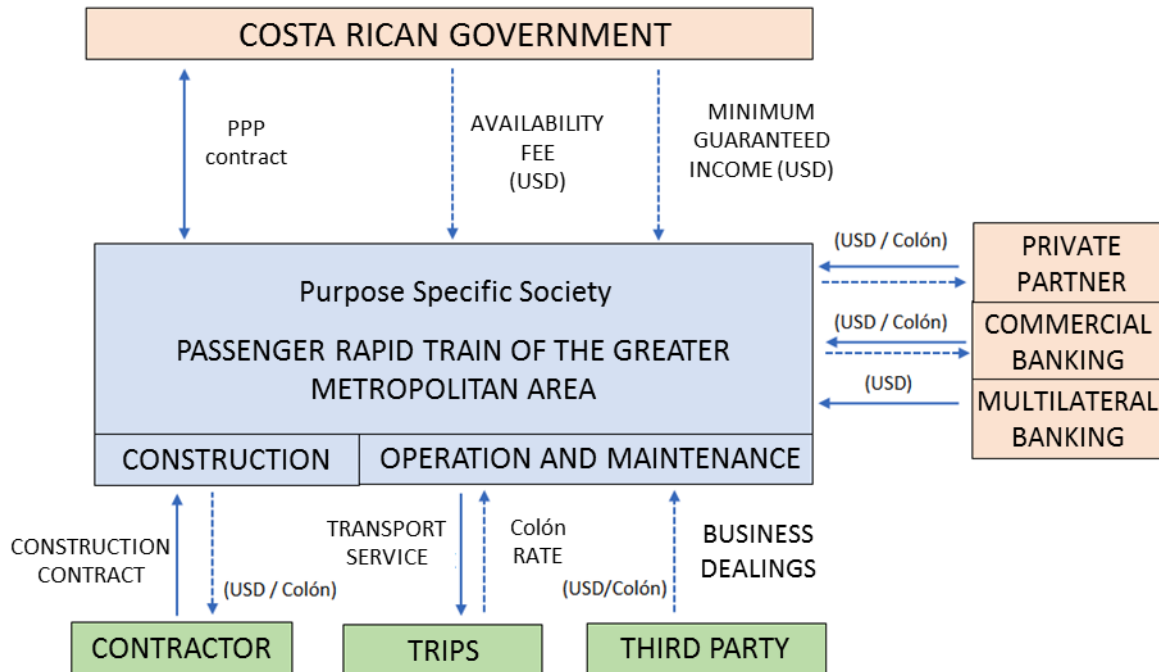


Figure 4. Operational structure of PPP proposed for the development of the Project.