

Seeking Sustainable Funding for All Phases of the Infrastructure Asset Management Life-Cycle

Two Case Studies:

*The Cantonal Road Network II in Costa Rica &
The Longchang-Naxi Expressway REITs in China*

Capstone Client: United Nations Department of Economic and Social Affairs

Project Title: A Practical Toolkit Embedding Management Practices in the Planning and Budgeting Processes

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List of Abbreviations

ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
CCLIP	Conditional Credit Line for Investment Projects
CR-L1065/PRVC-II	Cantonal Road Network Program II
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortization
ESG	Environmental, Social, Governance
GoCR	Government of Costa Rica
IAM	Infrastructure Asset Management
IDB	Inter-American Development Bank
MMEC	Maintenance Microenterprises by Community Standards
MOOC	Massive Open Online Course
MOPT	Ministry of Public Works and Transportation
PEU	Public Execution Unit
PPP	Public-Private Partnerships
REITs	Real Estate Infrastructure Trusts
SDG	Sustainable Development Goals
SIPA	School of International and Public Affairs
SPV	Special Purpose Vehicle
SRC	Securities Regulatory Commission
STAR Market	The Shanghai Stock Exchange Science and Technology Innovation Board
UN DESA	United Nations Department of Economic and Social Affairs

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Executive Summary

Recognizing the funding gaps that exist in the planning, acquisition, usage, and disposal stages of an infrastructure asset, this report highlights good practices available to their infrastructure managers (at the national and sub-national levels) which could be embedded across the infrastructure assets' lifecycle, to optimize its financial management and maintenance. The report aims to integrate the resource implication of the UNDESA Handbook on "Managing infrastructure assets for sustainable development" into financial and operational plans.

Using two case studies detailing the management of assets in China and Costa Rica, this report highlights notable financial strategies and practices used to fund infrastructure asset management (IAM). The research methodology is based on informational interviews of IAM field experts and desk research. The primary research interviews have been conducted with officials from, but not limited to, the Inter-American Development Bank and AVIC Fund Management.

To address the funding gap for IAM operations and maintenance, the report concludes by suggesting topics for future consultations of IAM experts, to be initiated by UNDESA, in order to optimize IAM governance, financial performance, and impact aligned with the SDGs.



1. Project Overview

1.1 Context

Infrastructure assets provide essential services to residents in communities around the world, and are frequently planned, created, operated, and managed by public governments. Only very few governments, however, have a centralized and holistic approach to managing their infrastructure assets. Fragmented approaches tend to be more common, but might lead to insufficient funding to address routine maintenance needs as well as for emergencies, negatively impacting government's ability to reliably deliver essential services.

The United Nations Department of Economic and Social Affairs has an ongoing initiative to support the sustainable management of assets in developing countries. The first phase of their work, *Knowledge Creation*, culminated in the publication of "*Managing Infrastructure Assets for Sustainable Development: A Handbook for Local and National Governments*" and " Massive Open Online Course on Infrastructure Asset Management (MOOC)". Their intent is to "support local and national governments with a set of practical tools to improve infrastructure asset management."

1.2 Objectives

This Capstone Report analyzes two case studies and underlines traditional and innovative practices in Infrastructure Asset Management (IAM), with a primary focus on financing. It aims to provide local asset managers and policy leaders with examples of achievable strategies in IAM, focusing on fiscally sound and sustainable funding for all phases of the IAM life-cycle. The goal is to promote a long-term view of infrastructure asset management that addresses the funding gap for the operation and maintenance phases of asset management.

The first case study, the Cantonal Road Network II program in Costa Rica, is used to highlight good practices for national and sub-national governments working with multilateral lending institutions. The second, the Longchang-Naxi Expressway in China, is used as a backdrop to explore the opportunities and challenges of using Real Estate Investment Trusts (REITs) to finance, in part or in full, the acquisition, operation or maintenance of infrastructure assets.

The selected case studies are meant to both reflect the recommendations provided in the Handbook for Local and National Governments and lay the groundwork for additional recommendations on finance-specific strategies. Particular attention is paid in the 9. Way Forward section on recommendations and requirements for replicability of these strategies.

1.3 Approach

Our approach for this Capstone Report is to conduct primary and secondary research on two case studies to highlight notable practices in Infrastructure Asset Management (IAM) and identify the replicability of certain financing and governance strategies. The case studies chosen

are the Cantonal Road Network II in Costa Rica, an ongoing road development project mostly financed by the Inter-American Development Bank (IDB), and the Longchang-Naxi Expressway, one of the first infrastructure assets in China to issue REITs.

The case study selection was done using three criteria: relevance to client, ease of comparability, and accessibility of information. Both project locations were of interest to UN DESA; both projects are expressway developments; and both are large projects with public and accessible documentation.

Our primary research took shape through interviews and close analysis of project related documents. Our interview contacts were sourced from organizations such as the Inter-American Development Bank, AVIC Fund Management, and others. Though not all insights were shared on the record, all conversations contributed to this team's understanding of IAM financing. More can be found on the interview contacts in Annex 1.

1.4 Methodology

For each case, a combined approach of quantitative and qualitative analysis was employed. The quantitative analysis was mainly used for primary research focusing on financial data. Financial statements of the projects, such as the balance sheet, income statement and cash flow, were used to test profitability and provide suggestions for funding management. All the financial data is based on earnings reports and publicly accessible data from 1999-2022.

For the Cantonal Road Network II, we looked at the asset maintenance life cycle phases and identified successful financial and management decisions. We broke down the IDB's investments, the project objectives, and management strategies. We expand on how actors in developing countries might address the funding gap for the operation and maintenance phases of an asset's management by exploring innovative financing techniques in the Latin American region.

After reviewing the use of REITs in the case of the Longchang-Naxi Expressway, we explore the feasibility and financial rationale of REITs. The qualitative analysis relies primarily on secondary research, including a detailed literature review of publicly available information including sector studies such as the transportation sector, company specific reports and field experts' interviews on infrastructure asset management. Alternative financing in the form of REITs was identified as a potential solution to the identified gap in revenues and expenditures on Chinese toll roads. We aimed to verify the necessity and profitability of REITs and provide suggestions for the necessary regulatory protections.

1.5 Constraints

One of the central constraints in this Capstone project was time. The scope of potential research was large, but the decision to focus on only two case studies was necessary due to the time frame allotted for the project. Another limitation was COVID-19, which prevented in person interviews with experts and in person meetings with the client. Although virtual calls were substituted, the experience was overall impacted. Finally, planning was required to overcome the language barriers that were generated by our choice of case studies: one with documents

in Spanish and the other with documents only in Mandarin. We eventually succeeded in overcoming that challenge by taking advantage of the multilingual make-up of the team to allocate projects depending on individual strengths.

2. Multilateral Lending and Infrastructure Asset Management: Costa Rica and the Inter-American Development Bank

The first portion of this report is an in-depth analysis of an ongoing multilateral lending operation in a developing country. This operation took place in Costa Rica as part of the Transport Infrastructure Program launched by the Government of Costa Rica in 2008 with the financial assistance of the Inter-American Development Bank. The aim of this program is to bring the country's transport infrastructure up to current standards, while also satisfying sustainable development goals and meeting cost-effectiveness requirements. Through this case study, we demonstrate how multilateral development banks such as the Inter-American Development Bank help governments in developing countries finance large-scale infrastructure projects via the provision of loans with much more favorable terms than what might otherwise be available from commercial banks. To broaden our perspective, we will conclude our analysis by providing a selection of alternative financing mechanisms previously used in the Latin American (LATAM) region.

2.1 The Transportation Infrastructure Program

Over the past 25 years, Costa Rica's steady growth has enabled the country to rise to the wealth level of an upper middle-income country, but it also put significant strain on the country's underdeveloped transportation infrastructure. Despite roads being the principal means of transportation in Costa Rica, the network has gradually deteriorated since the 1990s as fiscal tightening led to a drastic decrease in the investment budget for roads and highways.¹ Decades of insufficient investment in transport links has thus left the Costa Rican road system in disrepair, steadily increasing maintenance and operating costs and ultimately hurting the country's overall competitiveness.²

In order to address this problem, the Government of Costa Rica (GoCR) acquired the assistance of the Inter-American Development Bank and worked in cooperation with the country's Ministry of Public Works and Transportation (MOPT) to set up a National Plan for Road Development with the aim of restoring and upgrading the country's transportation network. The Transportation Infrastructure Program is made possible through a loan provided by the Inter-American Bank of Development as well as by a contribution financed by the local counterpart, which is the GoCR. The financing of this program is thus planned at the national level while the execution of the individual operations is being carried out by local actors.

The Bank will support the MOPT by contributing to a credit line with the aim of financing a more

1 Loan Proposal for CR-X1007. P. 2. Available at: <https://www.iadb.org/en/project/CR-X1007>

2 Ibid.

efficient transportation system with better physical infrastructure in the different sub sectors under the Ministry's responsibility.³ The Conditional Credit Line for Investment Projects (CCLIP) amounts to a total of \$1.05 billion, divided into \$850 million provided by the Bank and \$200 million by the local counterpart. Each individual operation under the CCLIP is expected to contribute directly to the expansion and improvement of the existing infrastructure in the country in order to reduce transportation costs, increase accessibility and improve road safety, with a view to boosting the country's overall competitiveness.⁴ Under this multisector CCLIP, a number of distinct individual operations will be financed in different sub sectors, including road, ports, air, and railways transportation. An exhaustive list of these operations is provided in Annex 2.

2.2 The Cantonal Road Network II Program

2.2.1 Overview

At the present time, the MOPT is working on the Cantonal Road Network II Program (CR-L1065/PRVC-II). This is the fifth operation undertaken under the CCLIP and it will be the focus of our Costa Rican case study. The Cantonal Road Network II Program is a continuation of the First Road Infrastructure Program launched in 2008 and the Cantonal Road Network I Program launched in the same year. The specific objective of this additional program is to further the improvement previously undertaken on a number of the country's 82 cantonal roads. The Cantonal Road Network II Program aims to improve some of the remaining roads through rehabilitation and climate risk mitigation, the reduction of operating costs and travel times, and the strengthening of the institutions responsible for road maintenance. It is expected that this will contribute to economic activity and empower poverty reduction efforts in Costa Rica.

2.2.2 Actors and Responsibilities

The MOPT, in cooperation with the National Roads Council, the Vice Ministry for Infrastructure and Concessions and the Public Work Division, currently oversees the execution of all the individual operations covered by the CCLIP. The MOPT is also in charge of allocating funding to the local cantonal administrations for their respective projects. Implementation and coordination units, assisted by external consultants sent by the IBD, are then responsible for carrying out the individual projects in each canton.

The Government of Costa Rica acts as the borrower, and the MOPT as the executing agency through a PEU (Public Execution Unit) that reports to the Public Works Division. The PEU focuses on three distinct areas of the program: 1) procurement, finance, and legal support; 2) road project management and environmental and social management; 3) and institutional strengthening and coordination with the municipalities. The role of local governments, with technical support from the PEU, is divided into different responsibilities that include the identification of projects, their design, project engineering, the securing of work permits, the management of socio-environmental factors, the report of the project's progress to the PEU, routine mainte-

3 Ibid.

4 Loan Proposal for CR-X1007. P. 2. Available at: <https://www.iadb.org/en/project/CR-X1007>.

Figure 1: Structure of Cantonal Network Project Execution

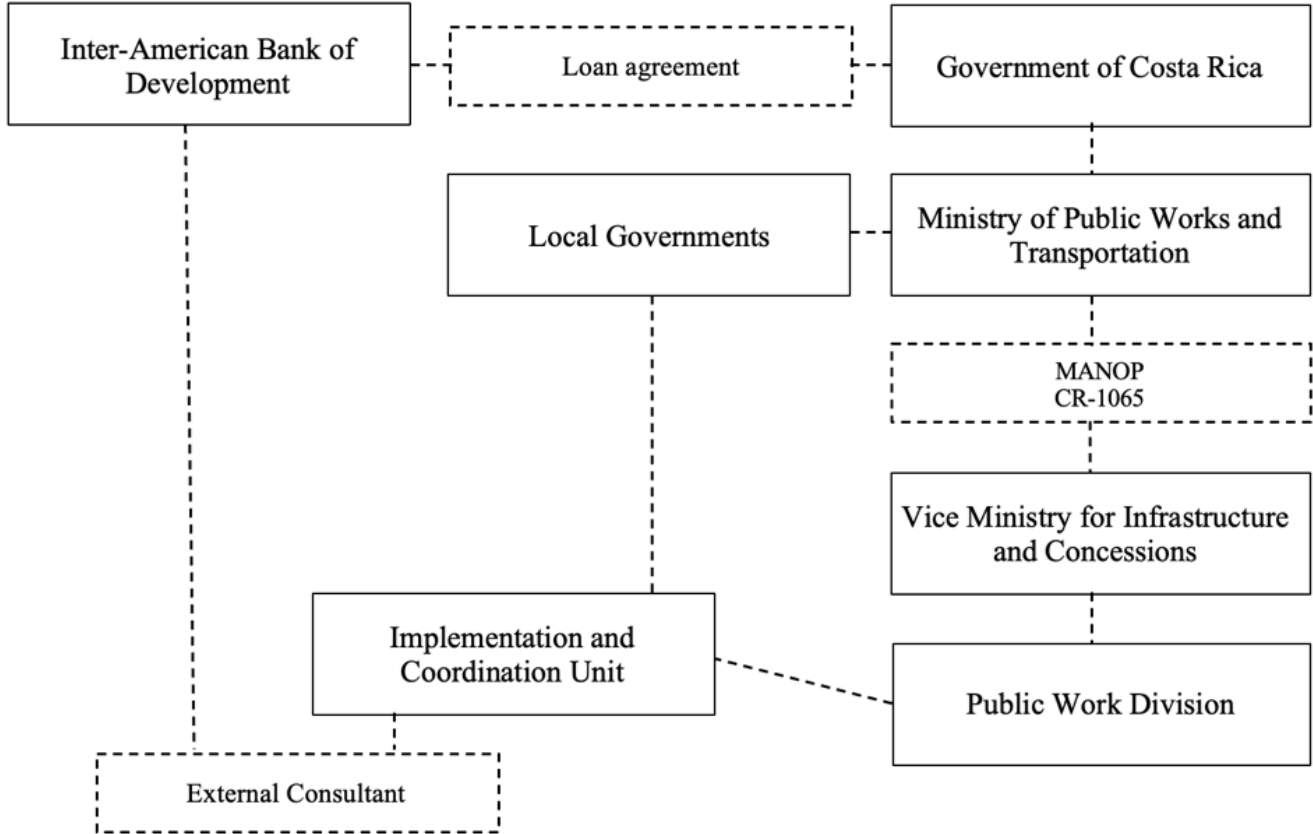
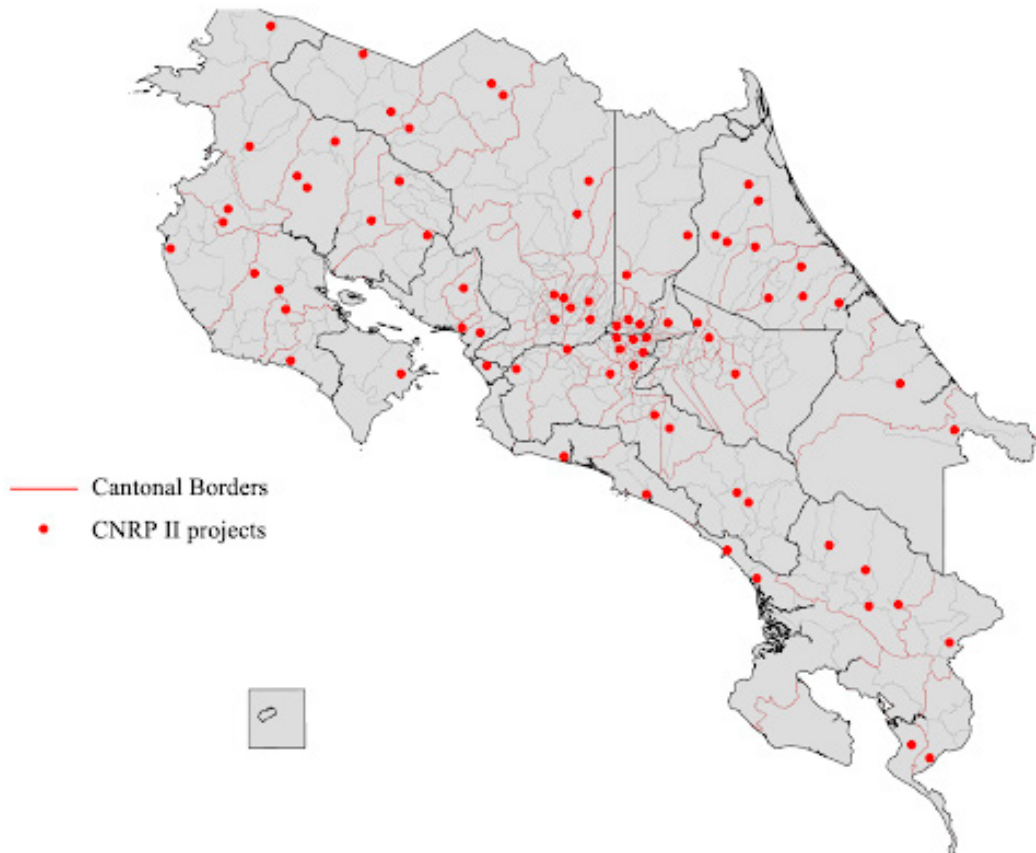


Figure 2: Map of Project Location by Canton



nance, and the proper use of the program. The role of external consultants is to provide administration, management, and audit services. This includes consulting services to provide ongoing technical advisory support, monitoring, evaluating, as well as financial audits. Under risk management, to address the socio-environmental aspects of the program, the PEU will have a social and environmental specialist and a permanent MRMTU staff to carry out inspections. To address the fiduciary risks related to obtaining budget funding in a timely manner and delay in the processing of payments, a representative of the MOPT's finance division is appointed on a full-time basis. A specialized cross-functional team of experts will be formed in the PEU to address the risks related to delays in contracting processes in the MOPT procurement unit, and adequate training will be provided in the procedures specified in the program's operating manual.

2.2.3 Financing

The Cantonal Road Network II Program's total cost is \$152 million, out of which the IDB Bank finances approximately \$144 million, and the remaining \$8 million is provided for by an external consulting service. The financial components of the program are divided as follows:

Table 1: Cantonal Road Network II Program Cost Breakdown

Cantonal Road Network II Program Cost Breakdown			
Component	IDB Budget	MOPT Budget	Description
Management Capabilities and Instruments	\$4,500,000	0	Strengthening asset management and planning and project cycle management
Rehabilitation and Maintenance	\$138,236,000	0	Rehabilitation of cantonal road network and bridges, including safety and socio-environmental management, including gender
Administration	\$1,300,000	\$8,000,000	Management, monitoring, evaluations, and financial auditing
Total	\$144,036,000	\$8,000,000	152,036,000

Table 2: Loan Disbursement 5 Year Schedule

Source	Year 1	Year 2	Year 3	Year 4	Year 5	Total	%
IDB	440,000	17,996,000	39,100,000	45,100,000	41,400,000	144,036,000	95
Counterpart	1,000,000	1,600,000	1,800,000	1,600,000	2,000,000	8,000,000	5
Total	1,440,000	19,596,000	40,900,000	46,700,000	43,400,000	152,036,000	100

The program is anticipated to complete in five years starting on the date of the loan contract. The loan is provided by the IDB to the GoCR and has an amortization period of 25 years. The repayment of the loan is the responsibility of the GoCR and the rates are determined by the country's sovereign rating.

2.3 Innovative Management Strategies

It is commonly observed in the Costa Rican cantonal road system that small roads receive inadequate maintenance and often provide fair, poor, or very poor service. As a first step, everything is done in the design, engineering, and construction of the roads to create a “maintainable path.” Having a well designed road with strong asphalt and good drainage does not guarantee permanent service delivery, however, and regular maintenance is always required.

In the Cantonal Road Network II Program, a special project was introduced to localized routine maintenance through microenterprises.⁵ The concept of Maintenance Microenterprises by Community Standards (MMEC) is a participatory method for the management and effective provision of services during the operation phase of the expressway asset. This service is done manually or with small machines and includes: cleaning sewers, clearing gutters or other water drainage channels, clearing vegetation such as grass or trees, cleaning bridges and other structures, removing small landslides, manually patching potholes, clearing road signs and vehicle barriers, collecting garbage. This is both preventative and responsive maintenance.

What is special about this program is that this work is carried out by a microenterprise of 13 locally selected residents. In addition, efforts are made to increase the share of women amongst workers and microenterprise managers. The objectives in this approach are the following:

- Create a culture of maintenance in the community and economy
- Demonstrate that maintenance is an option for economic development
- Decentralize the maintenance work and promote access to direct employment
- Boost the local economy through direct employment
- Promote human development and socio-economic integration of marginalized and lower-income populations
- Promote social control in communities through local-scope participatory processes
- Establish institutional and local capabilities for maintenance

Local craftsmen are hired, supervised, and paid by the local governments of each municipality. There are legal protections against discrimination, and the IDB specifically supports the target of women’s involvement in the microenterprises. The funds for work payment come out of the CR-L1065/PRVC-II budget distributed by the MOPT. The municipality where the work is conducted reviews the impacts monthly, which is the basis of payment.⁶ The quality control is done on the basis of the evaluation standards provided by the IDB and MOPT.⁷

The IDB supported this initiative, begun during the Cantonal Road Network I Program, in large part because of the gender development aspect. One of the Development Objectives regularly evaluated in the project is the percentage of women in the microenterprises. In 2018, the measure was 7%, but the target for 2023 is 20%. This aligns with the Bank’s larger ESG and SDG

5 IDB. Microempresas de Mantenimiento por Estándares Comunitarios, MMEC. (shared privately).

6 Ibid.

7 MOPT. Manual Para La Evaluación de la condición superficial y del mantenimiento de proyectos visuales para el segundo programa red vial cantonal (PRVC-II). December 2020.

metrics, as this component of CR-L1065 is rated “Pro-Gender.”⁸

2.4 Alignment with the *Handbook for Local and National Governments*

Two clear ways in which the IDB and MOPT collaboration align with UN DESA’s recommendations for Sustainable Development are managing through a Portfolio Approach and taking advantage of a National Enabling Environment.

The first is clear through the CCLIP project breakdown in Annex 1. The Government of Costa Rica and the MOPT sought support for a wide array of projects to tackle sub-national (cantonal) and national roads and even ports and bridges, all at once. Managing these diverse assets together means it is easier to allocate resources and identify needs.

The second is utilizing a National Enabling Environment. The CCLIP and all subsequent projects fall under the Government of Costa Rica’s stated priorities of transportation infrastructure redevelopment. The national government’s desire to address the entire country’s transportation infrastructure is reflected in their willingness to sponsor a large loan, managed and spent by canton and municipal governments.

The project aligns with the UNDESA Handbook in terms of financial and operational management. However, the document does not lay out the procedure MOPT and IDB plan to adopt to minimize the use of energy across the life cycle of the infrastructure asset.

2.5 Multilateral Lending Governance Advantages and Risks

Working with a large multilateral lending institution like the Inter-American Development Bank has its advantages and challenges. High quality standards are enforced for engineering, environmental and social management, and financial feasibility, which help ensure the asset can deliver dependable service. Also, long term partnership with a knowledgeable institution, over many years and many projects, leads to significant knowledge transfers and improvements in operational capacity for the local counterpart. However, working with a multilateral lending institution can mean that specifically the financial gap for the operation and maintenance phase of the asset lifecycle is not well addressed.

In order to approve the loan proposal, the IDB conducted rigorous feasibility studies for the design, engineering, and financial feasibility of the Cantonal Road Network II Program.⁹ These acted as safeguards which verified the work primarily conducted by the local executing agency, the MOPT, which are in charge of the design, engineering, and implementation. The Bank has extensive procedures and experience also in Environmental and Social Management (ESM). It

8 IDB. PMR Public Report (CR-L1065). October 2021.

9 Interview with Isabel Granada. March 2022.

is likely that the Bank’s requirements for ESM exceed that of the local counterpart, meaning that environmental risks are better addressed.

Over several years of partnership and the intentional separation of projects into phases, such as the Cantonal Road Network Program I and II, the executing agency can learn a lot. First, it is a large objective of the project to increase institutional operational capacity locally. Second, the Bank engages in technical collaborations which also improve management of the asset locally (Annex 1). Third, several targets include the creation and dissemination of documents which codify good practices.

The first component of CR-L1065 is improvements in management capabilities and instruments. One of the key indicators of the objective for the IDB is the percentage of municipalities in Costa Rica who realize their road management on the basis of established and approached plans for conservation, development, and security (PCDSV). At the start of the project, in 2018, only 49% of municipalities met this goal, but the target for 2023 is 100%.¹⁰

Another key indicator for the objective is the percentage of women managers in microenterprises for maintenance that exist in the country. In 2018, this was 7%, meaning 7% of the road maintenance microenterprises managers were women. The target for 2023 is 20%. In 2016 there were 4 such micro-enterprises, established by MOPT, but the goal is to increase them with the Bank’s support.¹¹

These new systems and documents also ensure long-term sustainability for the asset. Other outputs include:

Table 3: Selection of Output Metrics for CR-L1065

Selection of Output Metrics for CR-L1065			Physical Progress		Financial Progress	
	Output	Unit	2021	2023	2021	2023
1.1	Number of <i>trained</i> employees responsible for municipal road maintenance	Employees	78	243	333,333	1,000,000
1.2	Number of cantons with Five Year Road Plans for conservation and development	Cantons	20	41	0	676,500
1.3	Manuals for road safety and socio-environmental management	Documents	0	4	0	180,000

10 IDB, PMR Public Report. CR-L1065 February 2022. <https://IDBdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-998400382-69>

11 Ibid.

1.4	Number of cantons plans for the maintenance of active cantonal roads	Cantons	20	81	0	1,043,500
1.5	System for Maintenance of Active Roads has been implemented	Systems	0	1	400,000	600,000

Note: Table adapted from IDB PMR Public Report CR-L1065, February 2022.

The Bank promotes more sustainable asset management in the operation phase of the asset lifecycle indirectly, through rigorous standards and knowledge-based improvements to the executing agencies' and local government's operational capacity. However, the Bank does not have a direct financial stake in the long term operation and maintenance of the asset. Their responsibility is indeed the planning and implementation of a loan contract. For the MOPT and the GoCR, their responsibility goes further as it also covers the construction and rehabilitation of the roadways themselves.

The lack of direct financial incentive comes from the loan structure, which is sovereign between the GoCR and the IDB. Though the money is trickled down to national agencies, sub-national governments, and then local governments, and though the work is done at that level, the responsibility for repayment remains with the GoCR. This is a risk. With this structure, the revenue collected in a municipality or canton does not directly affect the likelihood of the IDB's loan repayment. If a municipality did not fund and implement regular maintenance, leading to reduced road service and toll revenue, there would be no risk to the IDB. Indeed, if the entire road network fell into disrepair faster than the expected 30 year lifetime, any multilateral lender could benefit from a new loan contract for renewed construction and rehabilitation.

Upon project completion, the Bank conducts an analysis of the project's targets and metrics. If the targets were not met, there is no financial consequence for the Bank or the loan-recipient. Instead, the project will receive an internal score used within the Bank based on Efficiency, Efficacy, Sustainability, and Relevance.¹² Within three years of project completion, the Bank reserves the right to visit the project site and identify problems, including lack of adequate maintenance. However, if the Bank were to do this and identify problems, there exists no supplementary budget from which to draw funds for repair. Therefore, the effect of the monitoring and evaluation is limited.

2.6 Alternative Financing Techniques in Latin America

The Transport Infrastructure Program in Costa Rica provides a more traditional approach to infrastructure asset financing, in comparison to the more innovative REITs financing used in the case of the Longchang-Naxi Expressway in China. Nevertheless, the Transport Infrastructure Program remains of interest to our study as it is a good illustration of a multilateral financing mechanism in which different actors participate in the financing of the entire lifecycle of an asset. In the Costa Rican example, the Inter-American Development Bank provides a large share

¹² IDB. Project Completion Report Principles and Guidelines. (OP-1242-5). November, 2016.

of the initial financing for the planning and acquisition phases, but the Costa Rican government takes responsibility for the financing of the operation and maintenance phases of the asset's life cycle. Through this financing mechanism, the government of Costa Rica is able to undertake large-scale operations such as the ones included in the Transport Infrastructure Program while also spreading the costs for these operations over a longer timeframe.

Other less-traditional financing mechanisms have also been experimented with in the LATAM region, some involving public-private partnerships (PPP). Urban Transport and Planning, E-mobility and Road Safety Consultant Oscar Edmundo Diaz worked on an urban public transport project in Bogotá, Colombia in which the procurement and the operation of the buses of the public system were entirely unbundled. This business model attracted new international players for the procurement component. Private-sector participants in this project were reimbursed via a trust fund that collected the revenues from the fares charged to customers. Those private-sector actors, who were awarded contracts through a tender process, proceeded to securitize the buses after getting the loan, which in turn enabled them to receive lower rates. As a rationale for this, Oscar Edmundo Diaz argued that "the increasing emissions produced by the transport sector require a shift to low and zero emission vehicles, innovative business models have become instruments to finance the procurement of these electric buses, for which the CAPEX is higher than for internal combustion buses." Besides public transportation projects, other types of PPP are currently under review in Colombia as part of the fifth-generation (5G) concession program.¹³ One of them is the Alo Sur highway PPP, which has just been approved by the Colombian Ministry of Finance and was introduced to us by former-advisor to the Mayor of Bogotá, Paola Cala Ortiz. The project aims to construct an avenue in southwestern Bogota, with the aim of reducing congestion around the city. However, the validation process for the project was lengthy since large-scale PPPs like this one usually come with a number of risks. Some of these risks relate to contingency and liabilities constraints but also political and environmental issues. Thus, before any PPP is approved, these risks need to be assessed and accounted for.

All of the aforementioned examples, whether it be in Costa Rica or in Colombia, thus provide us with good illustrations of how the financing of the lifecycle of an asset can be split between various actors so as to reduce and spread out costs and facilitate investment. This holds particularly true in less-developed and developing countries in which access to capital is limited, as is the case in a number of LATAM countries. Additionally, LATAM governments have also been resorting increasingly to financing techniques that are comparable to the REITs financing used for the Longchang-Naxi Expressway. Oscar Edmundo Diaz provided the example of the Government of the Dominican Republic which set up a REIT to finance road infrastructure construction and maintenance, in which the revenue came directly from the tolls. Recently, another REIT was created for the construction of two rail projects in the main two cities of the island. In this example, the revenue will come from the fare. Another REIT was set up for the procurement of buses for new corridors. This service was financed via a percentage on a new tax on gas which was channeled directly to a public transportation trust fund. These examples demonstrate that REITs financing can also be a solution in countries where public administrations have more limited access to resources and where the markets are potentially less liquid.

¹³ The 5G concession program is the latest multimodal program launched by the government of Colombia. It includes highway, airport, water and rail transport infrastructures.

3. REITs and Infrastructure Asset Management: The Longchang-Naxi Expressway, China

After years of overall economic progress in China, the regional imbalance gradually hampered the development of many state-owned enterprises managing infrastructure assets in less developed areas of the country. On the one hand, an infrastructure project has high construction costs and a long period of investment return. Government entities, consequently, carry too many debts and have difficulties in generating decent revenues for repayment. On the other hand, banks are concerned about the high debt ratios of these entities and, therefore, are reluctant to offer further financing services. As a result, an innovative financial product, Real Estate Investment Trusts (REITs), is urgent and necessary to provide alternative financing methods for government entities. This second section of the report will introduce an infrastructure project, Longchang-Naxi Expressway (LongNa Expressway), in Sichuan Province, China, which was securitized in 2019. The introduction will start from an overview of the project, challenges confronted by the owner, Sichuan Expressway Corporation, to the issuance of REITs that respond to the problems. This report will further expand on the details of REITs and end with suggestions of how this innovative product could be applied to infrastructure projects in other developing countries.

3.1 Longchang-Naxi Expressway, China

High speed expressways, similar to other large-scale infrastructure projects, share a set of specific characteristics, such as complex financing procedures and demanding planning requirements. As a result, high speed expressways are normally constructed and managed by local state-owned companies, which comply with the agenda of China's central government and acquire financial and logistical support from it. However, these companies are still confronted with financing pressure, especially in less developed areas.

3.1.1 Overview

The LongNa Expressway starts at the Longchang interchange of the Chengdu-Chongqing Expressway, and it passes through Longchang County, Luxian County, Longmatan District, and Jiangyang District. It ends in the Naxi District of Luzhou City. The expressway has a total length of 88 kilometers including connecting lines and 11 toll stations. Ten of them are currently open. The construction started on November 18, 1996. The whole line was completed and opened to the public on November 28, 2000, with a total investment of 2.275 billion RMB (0.36 billion USD).¹⁴

Before the securitization, LongNa Expressway was entirely owned and operated by Nanfang Company. This company's largest stakeholder, Sichuan Expressway Corporation, controlled 90.87% of shares. It is a province-owned company, and their main business line involves the

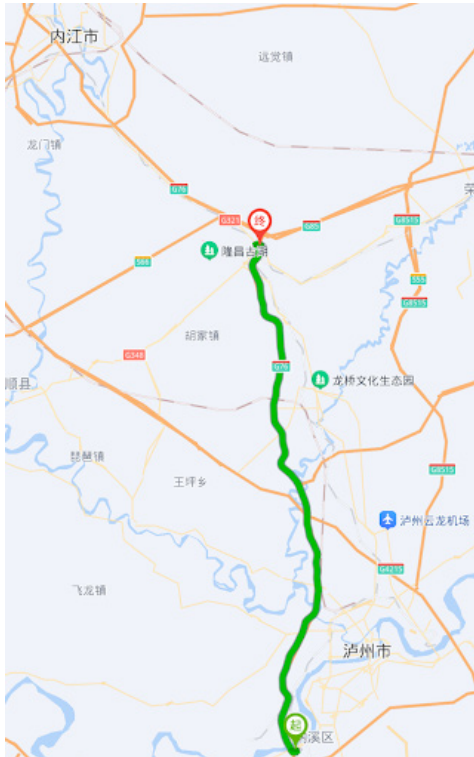


Figure 3: LongNa Map

construction and management of expressways and relevant supporting facilities. With 27 years of development, the corporation now owns total assets of over 320 billion RMB (50.2 billion USD), net assets of over 98 billion RMB (15.4 billion USD), and annual revenues of over 25 billion RMB (3.9 billion USD). The total mileage of highways managed by Sichuan Expressway Corporation is 5199 km, of which 3387 km are open to traffic, accounting for more than half of the mileage in Sichuan Province.¹⁵

Although the controlling shareholder of Nanfang Company is a deep-pocketed corporation, its financial situation remained delicate. Before the securitization of the LongNa Expressway, Nanfang Company owned total assets of 2.53 billion RMB (0.39 billion USD) but total liabilities of 2.55 billion RMB (0.39 million USD) indicating a negative debt ratio of 1.008.¹⁶ The construction and operation of LongNa Expressway had drained the contributed capital. Nanfang Company urgently required further capital injection.

LongNa Expressway is a high-quality asset with stable and sufficient annual tolls that could be securitized to protect Nanfang Company from bankruptcy. This expressway is classified as a “highway” (the highest class in the road reclassification), in accordance with Technical Standards for Highway Engineering issued by the Ministry of Transport. It can adapt to the average daily traffic volume of small passenger cars of more than 15,000 vehicles and is specially designed for vehicles to drive at high speeds in separate lanes. According to the financial data released in November 2019, the average daily traffic flow at the Luzhou toll station is more than 20,000 vehicles per day. In addition to its volume, the average permitted speed on LongNa expressways is between 80 and 100 kilometers per hour. The high classification of the highway ensures the abundant traffic volume, which guarantees the stable and sufficient annual tolls. Therefore, LongNa Expressway is a qualified underlying asset capable of being issued as infrastructure REITs.¹⁷

3.1.2 Actors and Responsibilities

The following parties are involved in the project and have the listed responsibilities.

Sichuan Expressway is the property owner, which initiates and establishes publicly offered infrastructure securities investment funds with infrastructure assets held. Also, Sichuan Expressway participates in the strategic placement of public funds, and the placement ratio is not less than 20% of the REITs’ offering shares. There exist regulations for Sichuan Expressway that for

15 Sichuan Expressway Corporation (SECDG) official website.
16 Xueqiu. “LongNa Expressway REIT Analysis.”
17 Baidupedia. Longchang-Naxi Expressway.

the holding period within 20% is not less than 60 months and for the holding period for more than 20% is not less than 36 months.

Chengdu Chengyu Jianxin Equity Investment Fund Management Co., Ltd. acts as the fund manager of the project. It would apply for registration of the infrastructure fund, conduct independent and comprehensive due diligence on infrastructure projects, and engage qualified professional institutions to provide professional services such as evaluation and auditing to ensure effective fund registration, share offering and investment. It is also responsible for the investment and operation of the fund, the preparation and disclosure of annual reports of the infrastructure fund on a regular basis, interim announcements on relevant matters in accordance with information disclosure requirements, as well as the regular evaluation of infrastructure assets and the fund.

Financial advisors would conduct comprehensive due diligence on infrastructure projects and produce financial reports.

The Fiduciary Agent would provide fund custody and monitoring services and is the same institution as the custodian of the Special Plan.

Other professional institutions mainly include **law firms, accounting firms and asset appraisal institutions**. Law firms issue legal opinions on the legality and compliance of infrastructure projects, the legality of infrastructure project transfers, and the qualifications of the main participants. Accounting firms issue cash flow forecast reports, audit the financial status of the infrastructure project and issue audit reports. The asset appraisal agency appraises the infrastructure project and issues an appraisal report.

3.1.3 Financing and Application of REITs

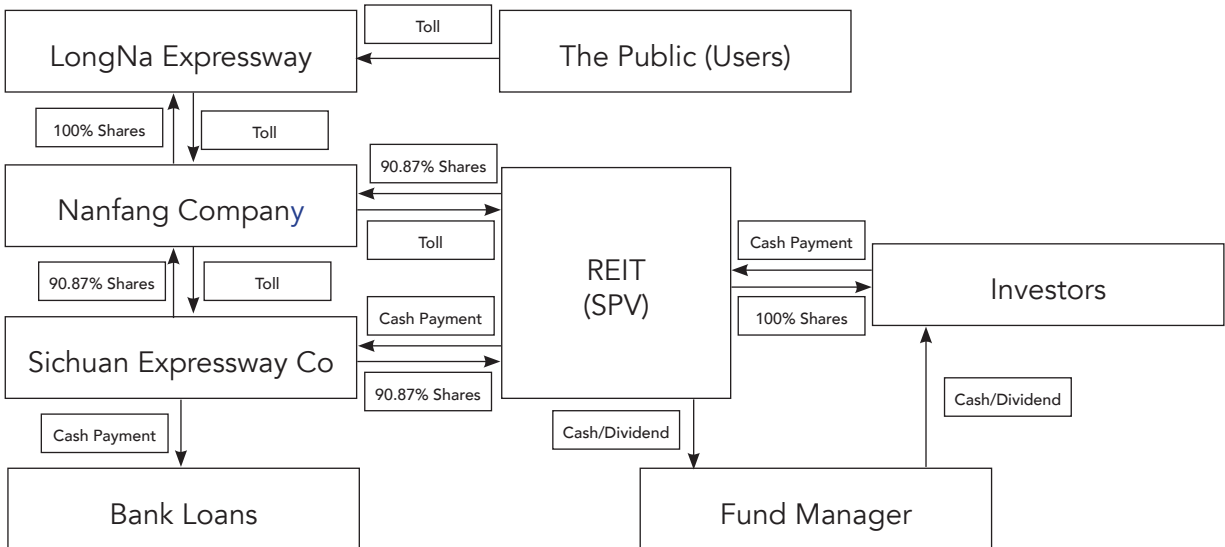
Table 4: bond ratings and corresponding value, interest rates, and maturity

	Senior Tranche	Subordinated Tranche
Credit Ratings	AAA	AA
Amount	1.644 billion RMB	0.333 billion RMB
Interest Rate	3.68%	-
Terms of Maturity (years)	10.92	10.92

On December 27th, 2019, “Huatai Sichuan LongNa Expressway Asset-Backed Project” was established at the Shenzhen Stock Exchange. Because this product is issued before China Securities Regulatory Commission’s official introduction of REITs in 2021, its structure and the issuance procedure are based on asset-backed securities (ABS). The product is tranching into senior and subordinated series with a total amount of 1.644 billion RMB (0.26 billion USD) and 0.333 billion

RMB (52 million USD) respectively.¹⁸

Figure 4: Structure of “Huatai Sichuan LongNa Expressway Asset-Backed Project”



According to the offering memorandum, 90.87% of Nanfang Company’s shares are owned by the Sichuan Expressway Corporation and are now securitized. The ownership is transferred to the public REIT, which is the asset-backed project. Sichuan Expressway Corporation raised 1.977 billion RMB (0.31 billion USD), of which around 0.11 billion RMB (17 million USD) was used for the acquisition of Nanfang Company’s shares. Around 1.87 billion RMB (0.3 billion USD) was used to repay the 0.47 billion RMB (73 million USD) principal and interest of bank loans from the Industrial and Commercial Bank of China and 1.40 billion RMB (0.22 billion USD) loans from original shareholders. After the LongNa Expressway was securitized, the bank loans were repaid and the Nanfang Company no longer suffers from short of operating capital.¹⁹

3.2 Framework of REITs

A Real Estate Investment Trust (REIT) is a company that owns and operates real estate that produces revenue. Although REITs are generally separated into two categories, equity REITs and mortgage REITs, this report will focus on equity REITs.

REITs share similar characteristics with equities traded in stock exchanges. The capital gains and losses are generated from the spot price differences at the time a trader purchases and sells the products. Companies managing the underlying assets of REITs also share dividends regularly, which are another source of capital gains.

The underlying assets of commonly traded REITs in the United States are private real estate, such as office and commercial buildings, hospitals, hotels, etc. This differs from their use in China, where the underlying assets are usually expressways, harbors, waste disposal plants, and other public assets.

18 Xueqiu. “LongNa Expressway REIT Analysis.”

19 Ibid.

3.2.1 Purpose

The reason for issuing infrastructure REITs depends on whether one takes the perspective of local governments or investors. From the perspective of government entities, they are suffering from heavy debt burdens and a shortage of funds for infrastructure construction. The government depends heavily on international institutions, such as the World Bank, the ADB, the AIIB, etc. Public infrastructure REITs provide an alternative financing method for the government that may come with attached benefits.

Compared with debt financing, REITs share some of the characteristics of equities. With the establishment of SPVs, assets of public services would be spun off from the government entities, as well as bank loans or other debts related to the assets. Funds raised through the securitization of SPVs are used (1) to purchase the assets of public services from the government entities, (2) to repay the bank loans related to the underlying assets, (3) to maintain the infrastructure projects. Therefore, the government could be alleviated from heavy debt burdens as debts are spun off from their balance sheets and their credit ratings could be consequently improved. The government entities could then raise funds for other or new infrastructure projects with improved credit ratings.

In addition to the benefit of less debt, the compulsory establishment of SPVs could be used to clarify the ownership of public services before the assets are officially securitized. The ownership of such public assets is sometimes obscure in many developing countries. SPV is a separate structure that related parent entities should carefully clarify responsibilities for the purpose of detailed disclosure in the financial markets. Relevant regulatory bodies should be careful about SPVs as they can often be used to spin off liabilities. The underlying assets and liabilities, therefore, should be examined with caution before the official issuance, for example, by investigating the combined financial statements of the parent entities and SPVs.

Furthermore, the government in many developing countries is much more decentralized. They face challenges of clarification of ownership of public services because of limited administrative power or complicated internal forces. However, sophisticated financial markets have strict regulations and requirements on information disclosure. Therefore, with the motivation of revitalizing the entities financially, the government of developing countries will passively put more efforts on disentangling the unclarified ownership structure of the public assets.

From the perspective of investors, public REITs could diversify their portfolios with emerging market assets and capture the economic development in these countries. Investors could look for less procyclical assets, such as expressways, or waste disposal plants, as they have relatively stable revenues compared to harbors, industrial parks, etc. The fluctuation in revenues is milder than the later assets. Also, they are less likely to be affected by external factors indicating less unpredictable risks. Harbors, for example, are influenced by global demand on domestic goods, and industrial parks face competition with nearby similar parks. Therefore, these characteristics could effectively improve investment bankers' ability to give values to the REITs.

3.2.2 Issuance and Markets

3.2.2.1 REITs Registration Requirements

In order to keep the application of REITs on developing countries' public services feasible and to make the market of REITs sustainable, public assets are required to meet certain criteria for securitization. According to the guidance released by Shanghai Stock Exchange, the securitization of public assets needs to fulfill requirements regarding the nature and financial conditions of underlying assets, past judicial records of parent companies, etc.²⁰ Relevant information is required to be disclosed regularly along with financial statements.

The following presents some important requirements according to the official papers released by SRC:

1. The ownership structure of the public assets is clear.
2. Initiators must have had no significant violation in laws and regulations in the past three years. During the operation of the public assets, there were no major problems or disputes in terms of safety, quality, and environmental protection.
3. The public assets must be transferable. Shareholders of the public assets are required to perform internal decision-making procedures and make a consensus of opinions on transferring the public assets to an SPV for securitization. Shareholders have responsibilities to work with law firms, auditing agencies, and investment banks to ensure that the transferred assets meet the relevant requirements.
4. The public assets for securitization must experience at least three years of stable and continuous operation. For infrastructure projects that have been in service for a long period, initiators are required to provide a thorough plan of sustainable management to guarantee the continuous service of the public assets.
5. The public assets have a good history of operation and have maintained profitability or positive net operating cash flow in the past three years.
6. If the majority of revenues of public assets come from a few entities, these cash flow providers should have a good history of operation and sound financial conditions. For example, a waste disposal plant signs contracts with the local government to collect and dispose of household waste.

In this case, the issuance and disclosure requirements must comply with China's laws and regulations. For developing countries that would like to issue REITs in other markets, for example, in New York, they must comply with the relevant requirements of the United States. Investors have rights to file litigation in New York against initiators over any disputes that they think violate the laws and regulations of the US Securities and Exchange Commission. These disputes include disclosure of misleading or false information, financial fraud, government corruptive practices, etc. Therefore, the effectiveness of the legal framework of the financial markets could keep the

20 Shanghai Stock Exchange. "The Guidance for the Issuance of REITs."

initiators accountable. Investors would be less concerned about the unsound legal system in developing countries.

3.2.2.2 Market Protection Mechanism

A new open market financial instrument requires a special protection mechanism to ensure the stability and depth of the market. These are the essential characteristics that guarantee the proper operation of a new market. A few measures need to be introduced to prevent the governments of developing countries from bailing out with limited costs. Especially, for the benefits of the developing countries, stability and depth of the markets are important characteristics to attract foreign investors and boost the development of the market. These measures are now applied on the STAR Market at Shanghai Stock Exchange for public listed companies (the STAR market is a board for science and technology focused equities), but they are also effective for REITs. Here are the two measures of investor protection:

(1) The minimum ratio of contributions: Government entities of the developing countries participating in the issuance of REITs should at least contribute 10% to 20% of the total fund raised to show their confidence in underlying assets.

(2) The lock-up period: The government entities are not allowed to sell their shares of REITs within 12 to 36 months after issuance.

The regulatory bodies must mandate issuers of REITs to publicly disclose ownership of shares regularly along with financial statements. The sudden reduction in shares may hint a deterioration of financial performance of REITs.

3.3 Evaluation

3.3.1 Advantages

For local governments and the industry as a whole, as local governments and state-owned enterprises currently engaged in infrastructure investment have limited sources of funding, infrastructure REITs can revitalize assets and transform illiquid infrastructure projects into more liquid financial products. In the long run, issuing infrastructure REITs can improve the long-term, highly indebted, asset-heavy operating model of the infrastructure industry and form a replicable virtuous cycle model of “capital + asset” and “construction + operation”. The funds recovered from revitalizing existing assets using infrastructure REITs can also be used for the construction of new high-quality asset projects, addressing common capital shortfalls.

For companies holding infrastructure assets, infrastructure REITs can revitalize long-term, large-scale inventory assets by transferring part of the project rights and raise funds for the investment and construction of new projects to achieve effective allocation of resources. From the perspective of asset valuation, infrastructure REITs are valued on the basis of EBITDA without considering the impact of depreciation, amortization and financing costs, which is more conducive to asset valuation. Also, the balance sheet can reduce the group’s consolidated gearing ratio.

For investors in the capital market, infrastructure REITs are publicly issued in the form of public funds. It has the characteristics of moderate risk, good liquidity and relatively stable return, between stocks and bonds. The new category of investment variety can effectively expand the investment boundary and improve the risk-return ratio of investment.

3.3.2 Risks

Risks mainly exist in project operation, liquidity, structural design, and the blocked period of strategic investment, which ultimately affects investors' expected dividends and the realization of investment returns.

3.3.2.1 Market Risks

Risks associated with the market include the following. First is policy risk that arises from changes in national macro policies (such as monetary policy, fiscal policy, industry policy, regional development policy, etc.), resulting in the fluctuations of its market price. The second is economic cycle risk. With the cyclical changes in economic performance, the level of returns is also cyclically changing. The third is interest rate risk. Fluctuations in interest rates in the financial market may lead to changes in prices and dividends of the REITs. The fourth is credit risk. REITs products may suffer from default in settlement, default of the issuer of the credit type invested, refusal to pay principal and interest due, reduction of credit rating or failure to fulfill other obligations under the contracts.

3.3.2.2 REITs-related Risks

The price of REITs might fluctuate, which will hamper investors' benefit. Most of the infrastructure assets have the attribute of equity. In terms of economic environment, operation management and other factors, the market value of the infrastructure project may decline, resulting in a decrease in the market price of REITs and there is even a risk that the infrastructure asset value may be seriously affected by extreme events. The trading price of REITs in the secondary market is determined by investors' bid and offer prices, and may fluctuate significantly above or below the REITs' net asset value due to investor preferences, market liquidity, public opinion, etc. Investors who hold the REITs for a short period of time may make profits or losses due to price fluctuations. Additionally, REITs operate in a closed-ended mode, with no subscriptions or redemptions and can only be traded in the secondary market. In China, the REITs market is still in the pilot stage, so the regulatory system, scale of product and the cultivation of investors are all in the early stages. Considering this, investors participating in REITs trading may face the risk of insufficient liquidity. They may not liquidate their funds at any time when they need money and lose other investment opportunities, or they have to trade at a discount to achieve liquidity. But during the pilot period, public REITs need to select no less than one liquidity service provider to provide services such as bilateral quotations for the Fund, which enhances liquidity.

3.3.2.3 Risks associated with the infrastructure assets

The first thing to consider is the risk in the operation of the infrastructure. Since our infra-

structure is a highway, traffic flow is the first factor. Highway traffic volume and toll revenue are affected by various factors, such as regional economic development, car ownership, and changes in fuel prices. Market substitution is also an issue. The possibility of new toll highways and rail networks in the same area may lead to substitution of transportation modes, bringing alternative diversions to traffic flow and certain market competition risks. The third is safety management risk. Infrastructure projects encounter safety issues in the management process of daily operation, maintenance and overhaul, which may lead to safety accidents and in turn may adversely affect the project company's cost control, project overhaul schedule, normal operation and image reputation. Also, the operation management organization needs to carry out daily maintenance and other operational management to keep the infrastructure projects in good, safe and smooth condition, which may affect the normal flow of roads, reduce the efficiency of traffic and affect the traffic flow; lead to an increase in the project company's operating costs and adversely affect the operating cash flow.

The second is policy-related risk. The infrastructure invested in by REITs relies on concession highway tolling rights, and the tolling standards and time frame are greatly influenced by laws, regulations and policies, which may result in lower tolling standards due to changes in relevant central or local government policies and regulations, etc., causing a reduction in the future value of infrastructure projects and negatively impacting the net value of the fund. This includes compliance risk, cash flow forecast risk and other risks. Compliance risks indicate that the ownership of infrastructure projects invested by REITs may be disputed, and the land proceeds included in the lease fees collected may need to be surrendered to the state in accordance with the law if the relevant operating agreement is found to be invalid. Cash flow forecast risk is that the factors affecting the future cash flow of infrastructure projects include the operation of infrastructure projects, fund management ability, etc. The forecast of future cash flows of infrastructure projects may be deviated to a certain extent, which may lead to investment risk due to the deviation. There also exist other risks, including natural disasters, war and other force majeure risks, major traffic accident risks, etc.

3.3.3 Improvement on Operational Efficiency

Since the LongNa project is a pilot project for infrastructure REITs in China, the data needed to prove that REITs facilitate asset management efficiency remains insufficient. Therefore, we decided to look at the data available for the HuyongHang Hui Expressway REITs. The fund was listed and traded on the Shanghai Stock Exchange on June 21, 2021 (fund extension abbreviation: ZJHH REIT, fund first day of listing abbreviation: NZJH, fund code: 508001). We assess the asset efficiency of this expressway's REITs in terms of its total asset turnover ratio from its balance sheet before and after the public offering.

$$\begin{aligned}
 \text{Total Asset Turnover Ratio} &= \text{Operating Income} / \text{Average Balance of Assets} \\
 \text{Average balance of assets} &= (\text{Initial balance of assets} + \text{Ending balance of assets})/2
 \end{aligned}$$

$$\begin{aligned}
 \text{The asset turnover ratio in 2021} &= 0.148 \\
 \text{The asset turnover ratio in 2020} &= 0.055
 \end{aligned}$$

From the results, it can be concluded that the total asset turnover ratio in the 2021 financial

report is much higher than the ratio in the 2020 financial report, which means that the assets in 2021 have been more fully utilized and have contributed more to the revenue of the company. However, since the project's infrastructure REIT was listed in the middle of 2021, we can only use this ratio as an asset operating efficiency improvement to reference.

However, according to the REITs' Third Quarter report of 2021 generated by Zhejiang Zheshang Securities Asset Management Co., Ltd, the Fund made increased efforts to ensure the asset's normal operation so as to protect its stable revenue and profit. The following two examples have been found:

1. The project company negotiated with China Merchants Bank, its supervisory account bank, on the interest rate of demand deposit and set its current deposit rate at 2.0%/year. The interest income from the deposit was realized during the reporting period (October - December 2021), totaling 2.423 billion RMB (0.38 billion USD) and is included in the dividend.
2. In terms of infrastructure operation, the project company actively maintained its road operation and did a good job in increasing revenue and plugging leaks. From October to December 2021, the Hang Hui section has investigated and dealt with a total of 2,187 illegal and under-standard traffic cases.

So, it is reasonable to assume that asset management companies under asset securitization have stronger motives to save cost and promote revenue growth, but this would be dug into further with more financial data available for analysis.

4. Conclusion

Our research confirms that UN DESA's ongoing initiative to support the sustainable management of assets in developing countries is of critical importance as sustainability and transparency issues have become a greater part of the debate around infrastructure assets. Our research reflects that governments in developing countries where capital is scarce but the need for public investment remains high have multiple options for financing, especially during the acquisition and planning phases of assets lifecycles. There is now a diverse roster of options for infrastructure financing models, and countries are increasingly interested in solutions that are tailored to their needs and advance their development with the most appropriate funding strategy based on their operating environment. Multilateral lending is decreasing in importance around the world, but it is here to stay, while other innovative financing strategies, like PPPs and REITs, are a promising infrastructure funding solution.

Our research looked at two financing examples which were successful and appropriate to the country in question. In the first research case study, we found that the Inter-American Development Bank brought financing, knowledge transfers, and support for innovative management practices to Costa Rica, leading to a successful infrastructure investment. However, the Bank and the local asset-management agency remained delinked from the financial risk of less-than-adequate asset maintenance, leading to long-term risks. In the same region, governments have begun implementing alternative financing methods. These methods can succeed in markets where capital is scarce, making them particularly attractive for these developing countries. Public-private partnerships for instance, as demonstrated in Section 6.6., have become an attractive financing mechanism in Colombia. Additionally, the issuance of REITs in a number of projects in the Dominican Republic in the past years also indicate interest and feasibility of this financing mechanism in the Caribbean as well as in Latin America.

In the second research case study, we explored how the issuance of REITs was used to bridge the financing gap for new projects as well as the maintenance of the LongNa Expressway. REITs are more suitable in financial markets with abundant liquidity. China has developed a sophisticated financial market with legal and regulatory frameworks enabling complex financial instruments to meet infrastructure financing needs. They introduced REITs in 2021 to provide an alternative means for the local government to raise funds. The use of REITs is a financing mechanism that widens the choice of developing countries' governments to fund infrastructure; and alleviates their concerns about dependence on multilateral institutions' lending. LongNa Expressway REIT demonstrates the advantages of securitization, which is a double-bottom-line. It raises funds to bridge the financing gap in infrastructure assets acquisition and promotes sustainable management of projects throughout the lifecycle. Public service investment companies have heavy debt to asset ratios during their construction phase challenged by the necessity to produce long-term investment returns. Intense capital needs during the construction phase crowds out funding for new construction and funding maintenance on existing assets. The issuance of REITs can be thought of as removing blood clots to improve the internal capital circulation to achieve financial sustainability. Developing countries' use of REITs can raise funds from foreign capital markets and mitigate the heavy debt burden on public service providers.

However, further country-specific examination on the application of REITs is required. Although conditions for robust legal and regulatory framework mitigating the downsides of REITs are detailed in this report, conditions for their replicability need further investigation, particularly to foster depth in markets. It is also important to examine how to ensure sufficient national and sub-national understanding and capacity for issuing REITs, and promote transparent ownership structures. The overall finding is that REITs are a financing alternative that have the potential to benefit infrastructure asset management in developing countries.

5. Way Forward: Addressing the Funding Gap for Operation and Maintenance

5.1 Suggested Way Forward for Asset Managers

Asset Managers working on infrastructure assets with multilateral lending partners should align as much of their project as possible with the values and mission of the loaning organization in order to optimize management support. Despite the multilateral partner's support in capacity building and management, the ultimate responsibility for the sustainable delivery of service through the asset is in the hands of the local asset manager. In order to optimize the support that multilaterals are able to give, asset managers can create productive conditions for collaboration along the lines of values and mission.

The local asset manager can identify if the partnered multilateral has a visible campaign towards a Sustainable Development Goal (SDG) or other metric, such as the IDB had for Gender development. Then, the asset manager can either create or adapt initiatives in the project proposal to align with those metrics, within the realm of reason. It is possible that the partnered multilateral will have increased interest in the initiative and as a result, provide more capacity support. Often, Asset Managers and International Lending Organizations already have strong relationships aligned with shared development objectives. In that case, the operational environment can be further improved by the asset manager prioritizing those value alignments with third party contractors as well. Creating a sustainability chain from third-party vendors, through the asset managing local agency and national government partners, all the way to the lending partner can align incentives and limit moral hazards.

One of the biggest benefits of working with a multilateral is the knowledge transfer that can occur from the multilateral partner to the local agency and vice versa. To optimize the potential gains, the local asset manager should be open to institutionalizing this knowledge transfer instead of relying on organic exchange. Be open to technical collaborations with the multilateral partner, and share data freely.

Finally, it was seen in the Transport Infrastructure Project in Costa Rica that the loans were parsed into smaller amounts and attached to specific projects, often multi-phase projects, within the CCLIP. This is beneficial to the asset manager. Although the local agency might wish to receive all the money the multilateral is lending at once, it can act as an insurance for both parties to have the loan given in project-attached installments. The creation of multiple projects under the CCLPP allows for smoother transitions where change-of-power occurs either in the multilateral or the local agency. It also automatically incorporates planning and budgeting steps at the start of each new project. Since the sustainability of the assets life-cycle is mostly decided in the planning stages, this is beneficial for the local agency.

5.1 Suggested Way Forward for UN DESA

To further explore the replicability of the good practices highlighted in this report, we encourage UN DESA to organize multi-stakeholder discussions on the following themes. Below are suggested topics for field and policy experts' review.

Replicability of the Integrated Working Mechanism of Chinese Expressway's REITs

Example: Huyonghanghui Expressway's REITs launched in 2021, Huaxiayuexiu Expressway's REITs launched in 2021, Ping'an Jiaotou Guanghe Expressway's REITs launched in 2021

Topic discussions for experts' review:

1. Replicability of China's initiative, funding infrastructure assets with REITs, in Developing Countries.
2. How can the good practices in China, relative to REITs' governance, legal and regulatory frameworks, translate into good practices in other countries?
3. Explore the robustness of countries' government agencies that are overseeing the prudential, legal, and regulatory frameworks to mitigate REITs default risk. By extension identify regulatory and legal authorities (at the regional, national and supranational levels) that would warrant an eventual orderly REITs default, in the best interest of the end-users of the infrastructure assets (embedded in the REITs.).
4. Standardize, at the subnational, national and international level, the reporting requirements of REITs including but not limited to: benchmark metrics used, credit rating definition, reporting frequency (quarterly, annually, rolling basis?).
5. Normalize the practice of using 3rd party credit rating agencies to assess accurate and credible REITs credit rating.
6. Explore the merits of using derivatives or other structured financial products to mitigate REITs non-performing risks for issuers, investors and end-users (stakeholders).
7. Identify governance, legal and regulatory norms and requirements fostering transparency of the underwriting process and trading of REITs.
8. Recommend the necessary extent of government authorities' legal and judicial powers to prevent or litigate REITs mismanagement and fraud.
9. Codify infrastructure value change due to natural disaster in contrast with an expected depreciation of infrastructure assets, and develop a framework determining the responsibility of public and private actors, to repair, dispose or rebuild infrastructures embedded in REITs issued.

Example: REITs in the Dominican Republic

Topic discussions for experts' review:

10. Can the limited investments in infrastructure REITs in developing countries be scaled up to attract domestic and foreign investment flows and how?
11. Evaluate REITs replicability to finance IAM in countries with less liquid debt markets
12. What is the impact of increased risk premia (environmental, political, economic) on the cost of capital to issue REITs and fund IAM?
13. Review the costs and benefits of governments pension funds, in investing in infrastructure REITs, particularly if the underlined infrastructure assets are funded by foreign loans.

Alternative Financing Mechanism in Latin America that bridge the gap of funding between acquisition and operation phases

Example: Bogotá Ruta del Sol highway

Topic discussions for experts' review:

14. Good practices for managing agencies to ensure robust institutional capacity for handling PPP contracts and their oversight throughout the IAM lifecycle.
15. IAM private partners' interests may not always align with those of the communities using the infrastructure (e.g.: decreased profitability). Identify good practices mitigating private partners' moral hazard in guaranteeing the provision of essential services from the infrastructure, under challenging conditions (e.g.: decreasing profits).
16. Identify good IAM practices of including private/retail, mixed revenue streams from PPPs to achieve a double/triple bottom line aligned with the SDGs.
17. Highlight good practices of IAM, involving PPPs, that benefit the poorest communities.
18. Codification of IAM prudential and regulatory requirements to vet and compensate contractors.
19. Good practices in using commercial concession to increase financing revenues of IAM throughout their life cycle (e.g.: Bogotá DEMOS concession for public spaces) to fill funding gaps.
20. Develop a framework fostering accountability, detailing the financial responsibilities of the public and private sectors funding IAM, in covering the cost of natural disasters and investing in new technologies (i.e. AI, machine learning, data-forward tracking and evaluation services) improving the efficacy of IAM.



Annex 1

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Annex 2

CLIPP Projects				
<i>Project</i>	<i>Description</i>	<i>Cost</i>	<i>Start Date</i>	<i>Status</i>
First Road Infrastructure Program CR-L1022	Loan	300,000,000 USD	08/2008	Closed
Cantonal Road Network Program CR-L1023	Loan	60,000,000 USD	12/2008	Closed
Support for a Second Road Infrastructure Program CR-T1083	Technical Collaboration	750,000 USD	11/2012	Closed
Exchange Experience on Environmental Management of Roads CR-T1108	Technical Collaboration	20,000 USD	03/2013	Closed
Infrastructure Transport Program (PIT) CR-L1032	Loan	450,000,000 USD	11/2013	Open
Support for the Preparation and Implementation of the Transport Sector Operation CR-T1123	Technical Collaboration	500,000 USD	05/2015	Closed
Support to the Strengthening of Public Works Investment Programs in Costa Rica CR-T1150	Technical Collaboration	280,000 USD	12/2016	Closed
Support to the Preparation and Execution of the Operations of the Transport Sector in Costa Rica CR-T1172	Technical Collaboration	450,000 USD	12/2017	Closed
Cantonal Road Network II Program CR-L1065	<i>Loan</i>	144,036,000 USD	03/2018	Open
Road Infrastructure Program and promotion of Public-Private Partnerships (PPP) CR-L1139	<i>Loan</i>	125,000,000 USD	09/2019	Open

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