TIMOR-LESTE TRANSPORT OPERATIONS

NOVEMBER 2018

ASIAN DEVELOPMENT BANK

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ADB

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FOREWORD

The Asian Development Bank (ADB) supports Timor-Leste's efforts to promote new sources of growth by improving service delivery and strengthening the business environment, with a focus on quality design and the efficient implementation of infrastructure projects. ADB's country partnership strategy, 2016–2020 will support economic growth and diversification by removing infrastructure bottlenecks and institutional constraints, and investing in human capital. This is fundamental for widespread poverty reduction and continued state building.

ADB has been supporting Timor-Leste since 1999 and has approved loans and grants totaling $342.77 million and technical assistance projects totaling $42.03 million. ADB programs in Timor-Leste will continue to emphasize knowledge, systems, innovation, and technical expertise to accompany traditional financial support.

Infrastructure is improving, but additional investments are needed to support inclusive growth. Real progress has been made in restoring and upgrading a core network of national, district, and rural roads. Prudent investment in new assets and the development of systems for operation and maintenance will help sustain recent progress and provide the conditions needed for inclusive growth.

This publication highlights the important aspects of ADB's operations in the transport sector in Timor-Leste, which is the backbone of the country's economic growth. It discusses the strategic priorities, volume of assistance, and project highlights, and shows how integrated and strategic development policies result in long-term sustainable benefits for the people of Timor-Leste.

Ma. Carmela D. Locsin
Director General
Pacific Department
Asian Development Bank

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ABBREVIATIONS

ADB	Asian Development Bank
ADF	Asian Development Fund
CAFI	Conselho de Administração do Fundo das Infraestruturas (Council for the Administration of the Infrastructure Fund)
DMC	developing member country
GEF	Global Environment Facility
JFPR	Japan Fund for Poverty Reduction
JICA	Japan International Cooperation Agency
JSF	Japan Special Fund
km	kilometer
MOI	Ministry of Infrastructure
MPW	Ministry of Public Works
OCR	ordinary capital resources
PIC	Pacific island country
TA	technical assistance

A highway in Timor-Leste, giving communities access from Dili to Tibar.

TIMOR-LESTE TRANSPORT OPERATIONS

Introduction

Since achieving independence in 2002, Timor-Leste has made progress in state building. However, while access to essential services (particularly electricity) has improved dramatically, key human development indicators remain among the lowest in the Pacific. The country's prospects hinge on prudent and effective use of savings from offshore petroleum production to finance investments in physical capital, human capital, and institutions needed to develop a sustainable non-oil economy.

The Asian Development Bank (ADB) has been providing development assistance in Timor-Leste since 1999, and has approved 15 loans and grants totaling $342.77 million and 49 technical assistance projects totaling $42.03 million. This includes initiatives to improve service delivery, diversify the economy, and support Timor-Leste's integration with the rest of Asia.[1] ADB is stepping up its program in the Pacific region. Countries will receive greater support through higher overall levels of financial assistance and an increased minimum country allocation. ADB's strong partnerships with bilateral and multilateral agencies—a prominent feature in the Pacific region—will facilitate the implementation and development of more transformative investments. These operations, together with policy advice and capacity development, will benefit from ADB's growing wealth of experience and knowledge.[2]

Upgraded road giving access to communities in Gleno.

[1] ADB. 2018. *Asian Development Bank Member Fact Sheet*. Manila.
[2] ADB. 2016. *Pacific Approach, 2016–2020*. Manila.

For Timor-Leste, assistance started in 2000 before officially becoming a member of ADB. Cumulative disbursements to Timor-Leste for lending, and grants financed by ordinary capital resources (OCR), the Asian Development Fund (ADF), and other special funds amount to $133.7 million.

The Timor-Leste Strategic Development Plan (SDP) 2011–2030 emphasizes investments in road infrastructure and prioritizes the rehabilitation and improvement (upgrading) of the existing road network. The SDP 2011–2030 prioritizes the development of human and physical capital through infrastructure development and capacity building. An infrastructure fund, backed by the Petroleum Fund, makes multiyear budgeting for large infrastructure projects. It is used as counterpart funds for donor-financed development projects, including transport infrastructure. In 2015, the infrastructure fund allocated $311 million for transport projects, especially roads.[3] This was equivalent to 20% of Timor-Leste's 2015 annual budget.

The Council for the Administration of the Infrastructure Fund (Conselho de Administração do Fundo das Infraestruturas [CAFI]) was established to guide infrastructure development. It is led by the Prime Minister, and Major Projects Secretariat handles planning, public–private partnerships, and loan-financed projects. Considerable investments in infrastructure were implemented, with more than $3 billion worth within the period 2012–2017. [3]

Nevertheless, government capacity is limited, and the demand is putting pressure on available

BOX 1: The ADB and Timor-Leste Partnership

Strategic priorities
- Improved connectivity
- Broadened access to services
- Resilient infrastructure
- Improved public sector capacity

Subsector coverage
- National roads and highways

Projects in the pipeline (2018–2020)
- Rehabilitation and upgrading of national roads and highways

Nonphysical advisory work
- Road fund and maintenance
- Project management
- Bioengineering for slope protection

Development partners
- Government of Australia
- European Union
- Global Environment Facility
- Japan Fund for Poverty Reduction
- Japan International Cooperation Agency
- World Bank

[3] ADB. 2016. *Pacific Transport Update 2015.* Manila.

resources. Neglect of road maintenance has resulted in the rapid deterioration of infrastructure. The magnitude and speed of reforms, coupled with overlapping institutional frameworks, demand a clear action plan.

ADB supports the government's priorities for improving linkages to rural and agriculture economies. Consequently, ADB is investing in road upgrading projects to improve the quality of the existing network. Support for the preparation of a transport sector master plan to serve as the transport system framework is also ongoing. Along with this plan, ADB would support the aviation sector, should the government so request.

The ADB program in Timor-Leste will continue to emphasize knowledge, systems, innovation, and technical expertise to accompany traditional financial support. The country partnership strategy (CPS), 2016–2020 supports the government's efforts to develop a sustainable non-oil economy by improving service delivery and strengthening the business environment. The CPS emphasizes on quality design and the efficient implementation of infrastructure projects.

The indicative lending pipeline for 2017–2019 includes additional loans for transport infrastructure, urban water supply, electricity supply, and education. Along with this plan, ADB would support the aviation, maritime, and public transportation sector based on the government's priorities.

Vehicles traveling along the highway West of Dili in Timor-Leste.

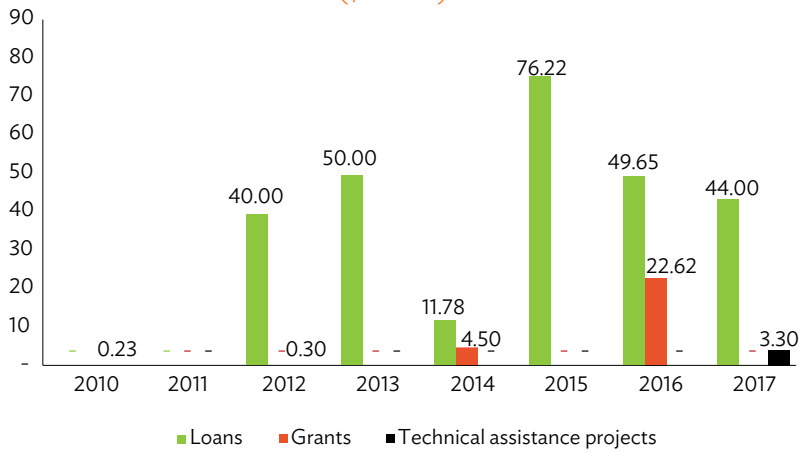
Improved road conditions will help the poor access services and opportunities faster and more efficiently.

ADB Assistance in Timor-Leste

Road transport is the main mode of transport in Timor-Leste. Around 6,000 kilometers (km) of roads comprise Timor-Leste's road network, which serves 90% of passengers and 70% of freight. Roughly 50% of the road network is underdeveloped rural tracks. The core network consists of 1,426 km of national roads and 869 km of district roads; almost 70% of these roads are in very poor condition and some sections are narrow and located in difficult terrain. Paved roads used to comprise 80% of the core network, but deterioration has left almost the entire network in disrepair and in need of rehabilitation or upgrading. Improvement of 475 km of national roads is ongoing, with ADB assistance. Details of all assistance from ADB for Timor-Leste can be found in Appendixes 1–3.

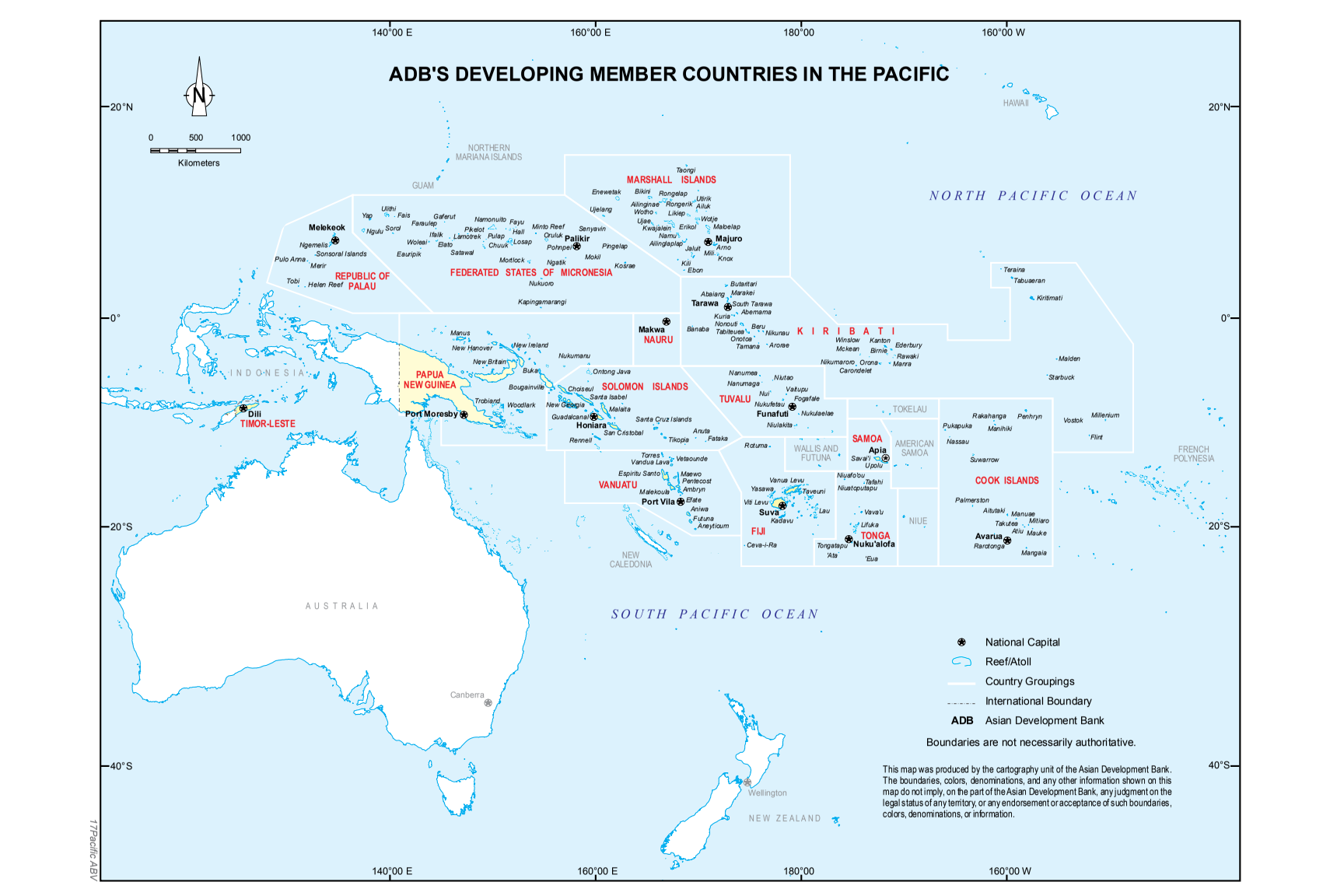
ADB's assistance is delivered in the form of physical works, plants, and goods, as well as nonphysical consulting and advisory services. Private sector consultants, contractors, and suppliers are the vessels through which ADB's assistance is realized. The quality and impact of ADB's operations depend on the capacity and performance of these private sector players. The list of top domestic and international contractors and consultants are in Appendix 4.

Figure 1: ADB Assistance in Timor-Leste, 2010–2017
($ million)



	ADB-Financed ($ million)	Cofinanced ($ million)
Loans	271.65	91.3
Grants	4.5	22.6
Technical assistance projects	3.60	0.23

ADB = Asian Development Bank.
Source: ADB (Pacific Department).


ADB'S DEVELOPING MEMBER COUNTRIES IN THE PACIFIC
140°00 E
160°00 E
180°00
160°00 W
20°N
0°
20°S
40°S
0
500
1000
Kilometers
N
NORTH PACIFIC OCEAN
SOUTH PACIFIC OCEAN
HAWAII
NORTHERN MARIANA ISLANDS
GUAM
MARSHALL ISLANDS
Taongi
Enewetak
Bikini
Rongelap
Utirik
Ailinginae
Rongerik
Ailuk
Wotho
Likiep
Ujelang
Ujae
Kwajalein
Erikol
Wotje
Namu
Majuro
Arno
Mili
Knox
Jaluit
Ailinglaplap
Kili
Ebon
Kosrae
Mokil
Pingelap
Pohnpei
Palikir
Senyavin
Minto Reef
Oruluk
Nukuoro
Kapingamarangi
Ngatik
Mortlock
Losap
Chuuk
Pulap
Pikelot
Hall
Fayu
Namonuito
Lamotrek
Ifalik
Faraulep
Gaferut
Faais
Ulithi
Yap
Sorol
Ngulu
Melekeok
Ngemelis
Sonsoral Islands
Pulo Anna
Merir
Tobi
Helen Reef
Eauripik
Woleai
Elato
Satawal
REPUBLIC OF PALAU
FEDERATED STATES OF MICRONESIA
Butaritari
Abaiang
Marakei
Tarawa
South Tarawa
Abemama
Kuria
Nonouti
Beru
Tabiteuea
Nikunau
Onotoa
Aranae
Tamana
Banaba
Makwa
NAURU
KIRIBATI
Teraina
Tabuaeran
Kiritimati
Winslow
Kanton
Ederbury
Mckean
Birnie
Rawaki
Manra
Nikumaroro
Orona
Carondelet
Malden
Starbuck
Manus
New Hanover
New Ireland
New Britain
Nukumanu
Bukari
Ontong Java
PAPUA NEW GUINEA
Bougainville
Choiseul
SOLOMON ISLANDS
Santa Isabel
Malaita
Trobland
Woodlark
New Georgia
Guadalcanal
Honiara
San Cristobal
Rennell
Santa Cruz Islands
Anuta
Fataka
Tikopia
Vetaounde
Torres
Vandua Lava
Espiritu Santo
Maewo
Pentecost
Ambryn
Malekoula
VANUATU
Efate
Port Vila
Aniwa
Futuna
Aneytioum
Port Moresby
INDONESIA
Dili
TIMOR-LESTE
AUSTRALIA
Canberra
NEW CALEDONIA
Nanumea
Nanumaga
Nui
Vatupu
Fogafale
Nukufetau
Funafuti
Nukulaelae
Niulakita
TUVALU
Nuitao
Rotuma
WALLIS AND FUTUNA
TOKELAU
SAMOA
Apia
Savai'i
Upolu
AMERICAN SAMOA
Nassau
Suwarrow
Rakahanga
Penrhyn
Pukapuka
Manihiki
Vostok
Millennium
Flint
FRENCH POLYNESIA
COOK ISLANDS
Palmerston
Aitutaki
Manuae
Takutea
Mitiaro
Atiu
Mauke
Avarua
Rarotonga
Mangaia
Vanua Levu
Yasawa
Taveuni
Viti Levu
Suva
Kadavu
Lau
FIJI
Ceva-I-Ra
Niuafo'ou
Tafahi
Niuatoputapu
Vava'u
Lifuka
Tongatapu
Nuku'alofa
'Eua
'Ata
TONGA
NIUE
Wellington
NEW ZEALAND
National Capital
Reef/Atoll
Country Groupings
International Boundary
ADB Asian Development Bank
Boundaries are not necessarily authoritative.
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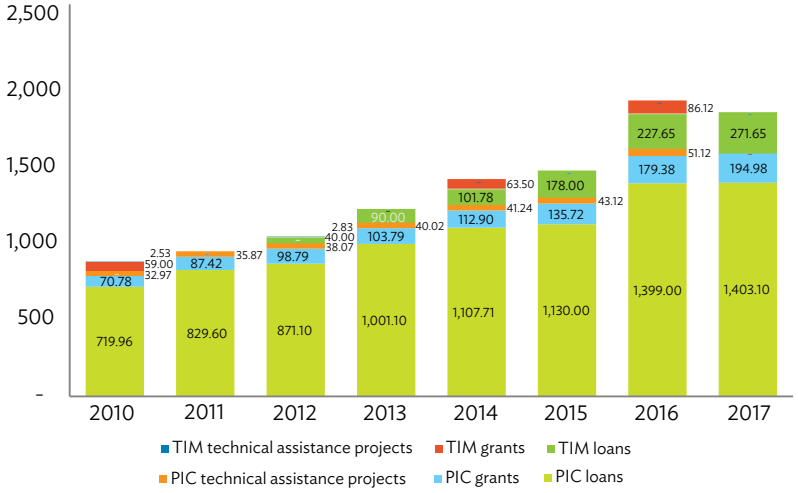
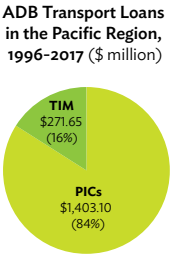
17Pacific ABV

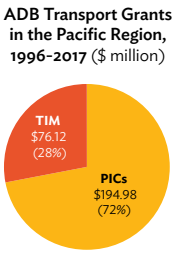
ADB Assistance in the Pacific Region

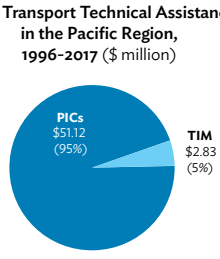
ADB has been providing development assistance across the Pacific for the last 5 decades, starting with port and road developments in 1969, followed by telecommunication in 1972, all in Samoa. ADB gradually forged CPS with the other Pacific island countries as they became ADB members, which translated into well-organized programs and inclusive plans that consolidated efforts to build competitive, sustainable, and resilient communities with very distinct development approach. Figure 2 summarizes the assistance provided by ADB from 2010–2017 in the Pacific region.

Figure 2: ADB Transport Loans, Grants, and Technical Assistance in the Pacific Region, 2010–2017 ($ million)









ADB = Asian Development Bank, PICs = Pacific island countries except Timor-Leste, TIM = Timor-Leste.
Source: ADB (Pacific Department).


124°30'E
Road Network Development Sector Project
Road Network Upgrading Project
Road Network Upgrading Project (additional financing)
Road Network Upgrading Sector Project
Road Network Upgrading Sector Project (additional financing)
Dili to Baucau Highway Project
Baucau to Viqueque Highway Project
Project by development partners
Completed: 65.65 km
Completed: 65.15 km
Ongoing: 44 km
Ongoing: 55 km
Ongoing: 80.125 km
Ongoing: 56 km
Approved: 58 km
[Completed: 39 km] [Ongoing: 47 km] [Pending
Ataur
Maumeta
DILI
Ai Pelo
Tibar
Liquica
Maubara
Railacu
Fatubessi
Gleno
Aileu
Atabae
Ermera
Maubiss
Aituto
Savu Sea
Batugade
Balibo
Maliana
Oeleu
Mota Am
Bobonaro
Ainaro
Sa
9°00'S
Pante Macasar
Sakato
Tumin
Citrana
Oesilo
Passabe
9°30'S
Fatululic
Zumalai
Hatu-Udo
Fohorem
Beco
Suai
Cape Suai
Salele
National Capital
District Capital
Town
National Road
District Road
International Boundary
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Ongoing road rehabilitation and upgrading to accommodate more vehicles and transport loads.

PROJECT PROFILES

1 The **Road Network Development Sector Project (Grant 0180)** financed part of the medium-term Road Network Development Program of the government. The project improved about 116 km of national roads to maintainable condition, established a road maintenance program, built access roads and parking areas of cross-border facilities, improved capacity of national contractors to implement road works, improved the capability of the government agencies to administer road projects and the road maintenance program, increased road safety awareness, and instilled climate-proofing in road design and construction.

Top: Before construction, Liquica-Maubara road section; *Bottom*: Same road section after construction.

Impact: Supported road sector development, leading to economic growth and poverty reduction in the project areas

Outcomes: Made socioeconomic facilities in the project areas more accessible and cross-border activities more efficient, reduced travel time and costs, and improved planning and project implementation in the road sector

Outputs:

1. About 116 km of national or district roads were improved to maintainable condition.
2. Road maintenance program was established.
3. Capacity of national contractors to implement road and maintenance works was increased.
4. The Ministry of Infrastructure's (MOI) ability to implement road projects and road maintenance program was improved.
5. Road safety awareness was increased.
6. Climate-proofing measures were made a regular part of road design and construction.
7. Access roads and parking areas were built to improve cross-border facilities at Mota Ain, Salele, Sakato, and Oesilo.

Approval date: November 2009
Completion date: May 2016

Financing:
ADB OCR/ADF grant: $46.00 million
Government: $6.90 million
Total: $52.90 million

Implementing agency: MOI

Top: Condition of the section R-4 Km 19+740, as of October 2014; *Bottom*: Completed road section, 2017.

Approval date: March 2012
Completion date: June 2017

Financing:
ADB–ADF loan: $9.15 million
ADB OCR loan: $42.63 million
Government: $28.10 million
Total: $79.88 million

Executing agency: CAFI

2 The **Road Network Upgrading Project (Loan 2857/2858, Loan 3181)** (i) reconstructed or upgraded and climate-proofed about 59 km of principal national roads, (ii) expanded the road maintenance program of the MOI, and (iii) prepared a feasibility study and detailed design for 81 km of principal national roads. In collaboration with other development partners, the project supported the progressive upgrading of the whole of the national road network.

Impact: Increased and more efficient movement of people and goods

Outcome: A more reliable and safer road network

Outputs:
1. National roads were upgraded and climate-proofed.
2. A feasibility study and a detailed design for the future upgrading of a priority road link were prepared.
3. Performance-based road maintenance contracts were introduced.
4. Awareness of road safety and transport-related social issues were increased.
5. Efficient project management services were provided.

3 The **Road Network Upgrading Project (additional financing) (Grant 0504)** received cofinancing grant from the European Union amounting to $22.37 million. The grant will share in the total project cost to (i) reconstruct or upgrade and climate-proof about 95 km of principal national roads, (ii) expand the road maintenance program of the MOI, and (iii) prepare a feasibility study and detailed design for 81 km of principal national roads.

Impact: Increased and more efficient movement of people and goods

Outcome: A more reliable and safer road network

Outputs:
1. District roads (44 km) will be upgraded and climate-proofed.
2. Performance-based maintenance provided.

Approval date: October 2016
Completion date: December 2020

Financing:
European Union grant: $22.37 million
Government: $0.75 million
Total: $23.12 million

Executing agency: CAFI

Top and bottom photos: Existing district roads in Ermera district.

Top: Laclubar Junction, 2017; *Bottom*: Laclubar bypass construction, 2017.

4 The **Road Network Upgrading Sector Project (Loan 3020/3021)** will (i) upgrade and climate-proof about 117 km of principal national roads, (ii) expand the road maintenance program of the Ministry of Public Works, and (iii) prepare detailed designs and environmental and social due diligence for upgrading 169 km of principal national roads through future projects. The project is in line with the ongoing efforts of ADB and other development partners to support the progressive upgrading of the entire national road network.

Impact: Increased and more efficient movement of people and goods

Outcome: A more reliable and safer road network

Outputs:
1. National roads will be upgraded and climate-proofed.
2. Feasibility study and detailed design for the future upgrading of priority road links will be prepared.
3. Performance-based road maintenance will be expanded.
4. Awareness of road safety and transport-related social issues will be generated.
5. Efficient project management support services will be provided.

Approval date: September 2013
Completion date: June 2020

Financing:
ADB–ADF loan: $10.00 million
ADB OCR loan: $40.00 million
Government: $73.25 million
Global Environment Facility: $4.50 million
Total: $127.73 million

Executing agencies: CAFI and Ministry of Public Works

5 The **Road Network Upgrading Sector Project (additional financing; Loan 3341/3342)** will scale up the project with upgrading and climate-proofing of additional 97 km of national roads from Baucau to Lautem and Atabae to Mota Ain.

Impact: Increased and more efficient movement of people and goods

Outcome: A more reliable and safer road network

Outputs:
1. National roads (97 km) will be upgraded and climate-proofed.
2. A feasibility study and a detailed design for the future upgrading of a priority road link will be prepared.
3. Performance-based road maintenance contracts will be introduced.
4. Awareness of road safety and transport-related social issues will be increased.

Approval date: December 2015
Completion date: June 2021

Financing:
ADB OCR loan: $53.00 million
ADB–ADF loan: $23.22 million
Government: $2.39 million
Total: $78.61 million

Top: Existing road in Lautem, 2017;
Bottom: Existing road in Atabae, 2017.

Executing agencies: CAFI and Ministry of Transport and Communication

Top: Before construction, Station 45 + 794, Dili–Manatuto Road; *Bottom*: Same segment during construction, October 2017.

Approval date: November 2016
Completion date: November 2022

Financing:
ADB–ADF loan: $49.65 million
JICA loan: $49.74 million
Government: $27.19 million
Total: $126.58 million

Executing agency: CAFI

6 The **Dili to Baucau Highway Project (Loan 3456)** will upgrade and climate-proof 105 km of the national road between the capital, Dili, and the second-largest town, Baucau, which is located on the north coast. The government has requested ADB to cofinance the project on a parallel basis with the Japan International Cooperation Agency (JICA). ADB will support upgrading and climate-proofing 56 km of the road connecting the towns of Manatuto and Baucau, and JICA will support the section between Dili and Manatuto (49 km).

Impact: Increased and more efficient movement of people and goods

Outcome: A more reliable and safer road network

1. National road between Dili and Baucau (105 km) will be upgraded and climate-proofed.
2. Performance-based road maintenance will be expanded.
3. Awareness of road safety and transport-related social issues will be generated.

7 The **Baucau to Viqueque Highway Project (Loan 3643/3644)** will (i) upgrade 58 km of national roads between Baucau and Viqueque, with climate proofing and socially inclusive design; and (ii) provide institutional strengthening and capacity building. The project is part of continuing efforts of ADB and other development partners to upgrade and sustain the country's national road network.

Top: An uphill section of Baucau-Vinelale going to Viqueque; *Bottom*: The down slope of the same road to Viqueque.

Impact: Increased and more efficient movement of people and goods

Outcomes: Improved road transport connectivity, and reduced travel time along the crucial north–south land transport link from Dili to Viqueque

Outputs:
1. Baucau to Viqueque Highway (58 km) will be improved.
2. Institutional strengthening and capacity building will be provided.

Approval date: February 2018
Completion date: June 2021

Financing:
ADB OCR loan: $19.00 million
ADB–ADF loan: $25.00 million
Government: $33.78 million
Total: $77.78 million

Executing agencies: CAFI, Ministry of Public Works, and Ministry of Transport and Communication

Construction on a section of the national road network in Timor-Leste.

TECHNICAL ASSISTANCE FOR INSTITUTIONAL AND CAPACITY DEVELOPMENT

Grant 9142-TIM Our Roads Our Future—Supporting Local Governance and Community-Based Infrastructure Works is a Japan Fund for Poverty Reduction (JFPR) grant to complement ADB-funded Road Network Development Sector Project (RNDSP). The key objectives were to (i) extend the socioeconomic benefits of the RNDSP to roadside communities through community participation in feeder road rehabilitation and maintenance, and (ii) develop a sustainable community participation model in community infrastructure work with the local government. The project was designed to support skills development for the rural poor and vulnerable groups through literacy; numeracy; basic business skills training; and raising community awareness through life skills programs on road safety, primary health, and life skills programs on gender. It also supported financial and capacity development for the piloting of decentralized rehabilitation and maintenance of feeder roads in three selected districts.

Approval year: November 2009
Completion year: October 2016

Financing:
ADB–JFPR: $3.0 million

Executing agency: Ministry of Infrastructure

Results: 97 community contracts were implemented in Bobonaro and Covalima districts and technical and basic business skills training programs to community workers were delivered. However, decentralized management of rehabilitation and maintenance works by the districts proved to be challenging and implementation remained mainly with the Ministry of Infrastructure.

Impact: Because of the project, communities became more aware of the benefits a community participation approach could bring in delivering rural infrastructure works. While sustainability of the project is hindered by the lack of capacity and ownership at the district level, ongoing rural roads programs funded by Australia and the European Union continue to provide support in other districts and expand its coverage in Timor-Leste.

Grant 0017-TIM Road Sector Improvement Project (RSIP) was aimed at improved road infrastructure for economic and social development and designed to (i) rehabilitate and improve about 123 km of core network roads; (ii) provide labor-intensive routine road maintenance on 45 km of roads; (iii) develop sound and sustainable road maintenance policies; (iv) establish an efficient bidding and contracting system for engaging communities in road maintenance through local small contractors; (v) improve project management, supervision, and monitoring; and (vi) identify modalities to ensure sustained rehabilitation and maintenance of rural feeder roads.

Approval year: September 2005
Completion year: April 2010

Financing:
ADB–ADF grant: $10.00 million
Government: $2.50 million
Total: $12.50 million

Executing agencies: Ministry of Public Works and Ministry of Infrastructure

Results: ADB rated the project *successful*. It has rehabilitated and improved 91 km of road, tested the application of modern forms of contracting to private operators, who then conducted routine maintenance using labor-intensive techniques on 47 km of roads, rehabilitated 15 km of feeder roads, and constructed 5 km of new roads through mobilization of communities. The project also (i) educated host communities on road safety and health protection, particularly on HIV prevention; (ii) trained work crew members in literacy and agroforestry, basic business skills, and livelihood management; and (iii) established a self-help microlending program. The program also generated employment for disadvantaged people and provided training on road maintenance.

Impact: Evaluation surveys in project influence area indicated slow but positive effects from overall economic growth through increased employment and freight traffic. There were also indications of some improvements to production and incomes, as well as increased use of social services. Villagers earned nearly $700,000 for labor on the project's core-network roadworks. The project brought benefits to women in the form of employment through a community empowerment initiative run by a nongovernment organization.

The **Technical Assistance (TA) 3731-TIM Transport Sector Improvement** funded through the Japan Special Fund (JSF) was to support the establishment of sustainable operations, management, and administration of the transport sector. The TA was intended to assist legal and operational establishments of effective and appropriately sized operations of the port, airport, and road subsectors.

For each of the three subsectors, key outputs included the (i) establishment of domestic counterpart, regulations and performance indicators; (ii) development of legal frameworks, operation improvement plans, and business development plans; (iii) applications to the necessary international conventions; (iv) recommendation of cost recovery measures; (v) plan for ensuring maximum private sector involvement; and (vi) time-bound plan for approving the legislation and operational proposals and support their implementation.

Approval year: October 2001
Completion year: June 2006

Financing:
ADB–JSF: $500,000

Executing agency: Directorate General of Roads, Bridges and Flood Control of the Secretary of State for Public Works, in collaboration with the Planning Unit under the Ministry of Public Works.

Results: The TA prepared an updated, comprehensive development strategy for the road system, including (i) identification of an optimal level of expenditure on road construction and maintenance; (ii) preparation of a road investment program; (iii) development of a program to increase expenditure and management capability for sustainable road maintenance; (iv) recommendation on road use charges; and (v) preparation of basic information that will serve the longer-term road planning and management needs of the government.

Impact: Because of the TA, the government approved the road sector investment program. Major achievements under the TA were (i) road inventory and survey, (ii) road investment program, (iii) road rehabilitation project preparation, (iv) labor-intensive maintenance, (v) community empowerment initiative, and (vi) transport sector institutional capacity building.

The objectives of the **TA 3401-TIM Transport Sector Restoration** were to (i) prepare a comprehensive transport sector study covering the three transport modes in Timor-Leste, and (ii) develop an integrated plan for an efficient and effective multimodal transport system to support long-term development and growth potential of the territory to encourage private sector development and pay particular attention to the infrastructure requirements of the poor.

Scope: For each of the three subsectors, namely land, maritime, and air transport, the TA (i) reviewed the legal, regulatory, and policy frameworks; (ii) proposed and established immediate management and administrative structures; and (iii) outlined specifications for an immediate and long-term restoration and procurement needs and development program.

The TA was relevant considering the situation of East Timor at the time. It was designed to allow maximum flexibility in the use of resources through the engagement of individual consultants. The terms of reference were defined broadly at the preparatory stage, and detailed when the specific technical needs became timely.

Approval date: February 2000
Completion date: November 2002

Financing:
ADB: $1 million

Executing agency: United Nations Transitional Administration in East Timor

Evaluation of outputs and achievement of outcome:
The restoration of operations in the three transport subsectors examined under the TA commenced in February 2002. The TA assisted in the preparation of

1. user charges for the port and airport subsectors,
2. management contracts for the operation of the port and the airport subsectors,
3. competitive and sustainable shipping services to Oecussi and Atauro,
4. institutional organization of the transport sector,
5. legislative framework for the transport sector,
6. reviews and assessment of port and airport sector investment and restoration needs, and
7. a multimodal transport plan.

The **TA 8278-TIM Infrastructure Management** was aimed to strengthen the higher-level systems and processes needed for effective and sustainable infrastructure management. The TA was to help the Ministry of Public Works prepare a long-term strategic plan that will set out the results targeted in the road transport, water and sanitation, and power sectors, and how these targets will be achieved.

Approval year: December 2012
Completion year: June 2017

Financing:
ADB Technical Assistance Special Fund: $1.50 million
Government: $10,000
Total: $1.51 million

Executing agency: Ministry of Public Works

Results: The TA targeted for the implementation of Five Capacity Development Sets which were delivered, namely Set 1: Strategic Results Planning for a Division; Set 2: Improved Management and Leadership; Set 3: Improved Systems; Set 4: Improved Planning and Budgeting; and Set 5: Improved Human Resource Management.

Impact: The TA made a significant attempt to improve the Ministry of Public Works strategic planning and contributed to capacity development objectives. ADB is now continuing to support development of a transport sector masterplan spearheaded by the Department of Transport.

The **TA 7698-TIM Supporting Road Network Development** aimed to establish conditions for coordinated, collaborative, and harmonized development partner support for the core national and district road program. The TA was funded by the Japan Fund for Poverty Reduction (JFPR).

Impact: An improved and sustainable road network in Timor-Leste. It is expected that by 2015, at least 500 km of national roads will be in maintainable condition, and at least 80% of required road maintenance works will be funded by the Government of Timor-Leste.

Outcome: The MOI and selected development partners (such as JICA and ADB) have improved understanding of the requirement of road network development.

Outputs

1. Road project preparation by the MOI, JICA, and ADB was harmonized.
2. Road network performance projection and results-based investment planning were enhanced.
3. Multimodal transport planning, covering land, sea, and air transport, was initiated by the MOI and development partners.

Approval date: December 2010
Completion date: December 2012

Financing:
ADB-JFPR: $225,000

Executing agencies: CAFI and Ministry of Public Works

A number of changes to the project financing environment occurred in 2011. The anticipated ADB–JICA cofinancing was consequently not pursued. Some elements of the TA became redundant, while others needed to be modified or supplemented.

Evaluation of outputs and achievement of outcome:
The environmental assessment and review framework, resettlement framework, and Timor-Leste Road Outlook report are key outputs that have contributed to the achievement of the outcome. The TA contributed for ADB, JICA, and the World Bank to have a harmonized approach aligned with the core network development program. A single project management unit for all development partner-financed national road upgrading projects has been established. At the end of 2012, 100% of development partner-supported national road upgrading projects (304 km with combined investment of $218 million) were under implementation.

The **TA 7100-TIM Preparing the Road Network Development Project** contributed to the government's objective of an improved and sustainable road network in Timor-Leste. The TA, funded by the JSF, helped the government to reduce the cost of transportation and improve the road network for economic development and social integration. The TA also assisted the MOI in preparing its national development plan for road infrastructure and identified institutional and policy reforms needed to improve sector performance. This was achieved by (i) undertaking a detailed assessment of the road improvement needs, (ii) preparing a national roads improvement program, (iii) preparing a labor-intensive road maintenance program, (iv) preparing a community-participated rural roads development program, and (v) institutional and capacity development of road infrastructure-related agencies under the MOI.

The TA was designed to assess the suitability of using a sector-wide approach for implementing the proposed project or its components.

Approval date: July 2008
Completion date: November 2009

Financing:
ADB-JSF: $800,000
Government: $200,000
Total: $1,000,000

Executing agency: Ministry of Infrastructure

Evaluation of outputs and achievement of outcome:
The project delivered on its intended impact, outcomes, and outputs. The project was the first attempt by Timor-Leste to shift external assistance from emergency response work to overall road sector development.

More importantly, it also tested ways to organize future road development and maintenance in the country. It identified strengths and weaknesses for application and ways to improve policies, planning, institutions, and capacity, and deepened the knowledge of the challenges faced by the road sector. In this respect, even the delays, cost overruns, and quality shortfalls provided valuable experience.

Before and after photos of ongoing rehabilitation of Timor-Leste's national roads.

SUSTAINABLE SOLUTIONS FOR ROAD PROJECTS

Timor-Leste Bioengineering Case Studies

Keeping in step with ADB's increasing emphasis on environmentally sustainable solutions, internationally accepted methods of bioengineering and biostabilization techniques have attained much attention in Timor-Leste. Soil bioengineering is a complementary and cost-effective addition to conventional hard engineering approaches that use rock-based and concrete physical structures. In some conditions, it is a viable alternative and possibly preferred substitute. This is relevant in circumstances where soil conditions are variable and where there are unpredictable seismic circumstances.

The government has recognized soil bioengineering as part of specifications for road projects with ADB and other development partners since 2012. Road improvement contracts include soil bioengineering as a fundamental element in the design of slope stabilization.

Soil bioengineering is particularly important for roads in Timor-Leste, where adjacent slopes have a plethora of stability problems. It can significantly reduce the risk of erosion by establishing vegetation in combination with timber and/or rock-based engineering structures to anchor and protect shallow-seated earth masses, preferably as soon as possible after cutting the slope.

Natural soils are shallow and poorly developed, and much of the natural vegetation that would otherwise prevent soil erosion is often removed by cycles of subsistence agriculture and burning (which is erroneously believed to restore soil productivity) to create small agricultural plots.

Good soil conditions do not develop easily in Timor-Leste due to steep slopes, which are often unstable, and human disturbance of natural vegetation. The limited remaining vegetative cover that has survived interventions for subsistence farming is insufficient to stabilize soil, resulting in poor erosion control. The situation is aggravated by frequent burning to clear more land.

Soil bioengineering principles and practices have been applied in three case studies on ADB road projects in Timor-Leste as shown in following.

Case Study 1: Live Stakes–Fill Slope (Road Network Development Project). Live stakes can be particularly useful in soil bioengineering, controlling erosion from shallow-seated earth masses. These may result from natural conditions or, in some cases, on fill slopes. Compaction of fill slopes is often difficult to achieve in steeply sloping terrain and live stakes had been applied soil bioengineering in the project, especially where there is a poor soil content in the fill material.

There are planting procedures and specifications in the application of live stakes–fill slope method in soil bioengineering (see Figure 3). This is to ensure the optimum benefit at the shortest possible time with considerable growth. In the project, the stakes were planted close together (50–60 centimeters apart) in rows starting at the bottom of the slope and working up. Close planting gave immediate physical reinforcement to the slope and a chance for roots, when formed, to interlock rapidly. The stakes used were local Indian Ash (*Lannaea coromandelica*).

The local subcontractors were also able to develop certain skills to manage the planting, care, and maintenance of the live stakes, especially on sloping and steep areas along the roads.

Figure 3: Using Live Stakes Method in Soil Bioengineering

Case Study 2: Mixed Grasses–Shallow 1:1 Cut Slope (Road Network Upgrading Project). Aside from the fact that they are easy to plant, grass species give rapid ground cover and growth on gently slopes that do not need major mechanical reinforcement either at the toe or the slope. It is even more advantageous if there is stable established vegetation above the slope. On cut slopes where the exposed soil is temporarily stable but still vulnerable to rapid erosion in the event of heavy rainfall, rapid regrowth of grasses can be achieved in a few weeks (see Figure 4).

Occasionally, live stakes were also inserted at 4-meter intervals to provide immediate reinforcement and mark the path lines. Light compaction before planting will also firm up the upper layers to prevent erosion between plants in the preliminary stages as growth commences. Rapid growth is best achieved when the slope is first trimmed and prepared by removing any boulders and large rocks.

Good growth was clearly visible within 3 weeks and grasses became fully established in 12 weeks, after which the slopes have been left to mature independently. The ideal planting period is wet season for optimum results and less watering. The grass species planted included mainly Vetivera, Kans grass, and elephant grass.

Figure 4: Using Mixed Grasses in Soil Bioengineering

Case Study 3: Slope Remodeling, Mixed Grasses, Palisades, Brush Layers, Live Stakes, Check Dams, and Gabions–Steep 1:2 Cut Slope (Road Network Upgrading Project). The third application is a result of instability unearthed and aggravated by roadworks. The presence of weak earth masses at the edge of the road is common in Timor-Leste. Road widening inevitably disturbs the slopes due to the necessary earthworks, which unavoidably aggravate the situation. In this case, soil bioengineering allows the soil mass to be stabilized through the combination of rock-based and vegetation-based reinforcement, armoring, and erosion control (see Figure 5).

During slope cutting of this poorly vegetated slope, the crest of a deep-seated fissure at the top was unavoidably exposed, apparently allowing water penetration under the slope during heavy rain and weakening the adhesion of the soil mass to the slope triggering a secondary soil landslip. In this case, the eventual amount of excavation was deliberately increased to allow the removal of the top part of the vulnerable soil mass and relieve some of the load.

The top was, thus, flattened and the remaining lower portions of the earth mass were initially stabilized at the toe with gabions, the slope was smoothed off and compacted. To keep water out of the slope top, a horseshoe arrangement of shallow channels (reinforced with bamboo) was created as shown in Figure 5.

From the top, further heavy rainwater could be directed to side gullies with a series of check dams, while rainwater diversion was created on the flat top of the slope using polythene sheeting held in place with sandbags and live stakes. From the bottom, the main earth mass slope was reinforced with bamboo palisades held in place with live stakes and interwoven with brush cuttings.

Figure 5: Using Rock- and Vegetation-Based Reinforcement in Soil Bioengineering

APPENDIX 1: ADB's Ongoing and Pipeline Projects

Loan Number	and Title	Year Approved	Completion Year	Approved ADB Financing ($ million)	Cofinancing ($ million)	Government ($ million)	Total Project Cost ($ million)	Target Output (km road)
A. Ongoing Projects (Loans and Grants)								
Loan 2857/58	Road Network Upgrading Project	2012	2019	40.00		13.66	53.66	60.60
Loan 3181	Road Network Upgrading Project (additional financing)	2014	2018	11.78		14.44	26.22	4.55
Loan 3020/21	Road Network Upgrading Sector Project	2013	2020	50.00		68.75	118.75	80.13
Loan 3341/42	Road Network Upgrading Sector Project (additional financing)	2015	2021	76.22		2.39	78.61	95.44
Loan 3456	Dili to Baucau Highway Project	2016	2022	49.65		27.19	76.84	56.00
Grant 0504	Road Network Upgrading Sector Project (additional financing)	2014	2019		22.37			
Grant 0404	Road Network Upgrading Project (additional financing)	2016	2020		4.50			
			Total	**227.65**	**26.87**	**126.43**	**354.08**	**296.72**
B. Pipeline Projects (Loans and Grants)								
	Baucau to Viqueque Road Project	2017	–	44.00			44.00	
			Total	**44.00**			**44.00**	

ADB = Asian Development Bank, km = kilometer.

Source: Asian Development Bank (Pacific Department).

APPENDIX 2: ADB's Ongoing and Pipeline Technical Assistance Projects

A. Ongoing Technical Assistance							Target Major Outputs									
TA Number and Title		Year Approved	Completion Year	ADB Financing ($)	Cofinancing ($)	Government ($)	LARP	EIA/ IEE	DD	PA	CB	O&M	SAS	PPTA	POR
TA 8278	Infrastructure Management	2012	2017	1,500,000		10,000					●				
TA 0027	Policy and Planning for Public Investments	2017	2020	2,100,000											●
TA 9495	Policy and Planning Development for Public Investments, Subproject 1	2017	2020	1,200,000											●
			Total	**4,800,000**		**10,000**									

B. Pipeline Technical Assistance							Target Major Outputs									
	Baucau to Viqueque Highway Project	2018		1,000,000										●		
	Trade and Transport Facilitation in the Pacific (TA8674 additional financing)	2018		1,000,000							●					
	Strengthening Domestic Transport Connectivity in the Pacific (*formerly Strengthening Connectivity in the Pacific*) (TA facility)	2018		2,000,000							●					
	Promoting Sustainable Land Transport Infrastructure	2018		1,000,000				●								
			Total	**5,000,000**												

ADB = Asian Development Bank; CB = capacity building; DD = detailed design, EIA = environmental impact assessment; IEE = initial environmental examination; LARP = land acquisition and resettlement plan; O&M = operation and maintenance; PA = procurement assistance; POR = policy reform; PPTA = project preparatory technical assistance; SAS = sector assessment and strategy.

Source: Asian Development Bank (Pacific Department).

APPENDIX 3: ADB's Completed Loans, Grants, and Technical Assistance Projects

A. Completed Projects (Loans and Grants)

Loan /Grant Number and Title		Year Approved	Completion Year	Approved ADB Financing, ($ million)	Cofinancing ($ million)	Government ($ million)	Project Cost	Output (km road)
Grant 0017	Road Sector Improvement Project	2005	2009	10.00			10.00	138.00
Grant 9142	Our Roads Our Future—Supporting Local Governance and Community-Based Infrastructure Works	2009	2016		3.00		3.00	
Grant 0180	Road Network Development Sector Project	2012	2016	46.00		6.90	52.90	65.65
			Total	**56.00**	**3.00**	**6.90**	**62.90**	**264.25**

ADB = Asian Development Bank, km = kilometer.

Source: Asian Development Bank (Pacific Department).

APPENDIX 4: Top Contractors and Consultants

A. International

Top Five International Contractors/Suppliers Involved in Civil/Construction Works under ADB Loan and Grant Projects, (1 January 2009–31 December 2016)		Top Five International Consultants Involved in Consulting Service Contracts under ADB Loan, Grant, and Technical Assistance Projects (1 January 2009–31 December 2016)	
Contractor/Supplier	**Total Amount ($ million)**	**Consultant/Consulting Firm**	**Total Amount ($ million)**
Shanghai Construction Group Co. Ltd. Barantas	44.48	Katahira and Engg International	8.17
R D Interior Junior Construction	38.89	Dongsung Engg Co. Ltd. JV Dong Il Engg	8.03
CBMI Construction Co. Ltd. / Chongking Road Engg	38.50	SMEC International Pty. Ltd.	5.89
PT PP Construction and Investment	37.56	Sinotech Enterprises Consultants Ltd.	4.41
China Nuclear Industry 22nd Const Co. LDA	22.17	Renardet S A Consulting Services	2.40
Total	**181.60**		**28.89**

B. Completed Technical Assistance

TA Number and Title		Year Approved	Completion Year	ADB Financing ($)	Cofinanciers	Government ($)	Major Outputs: LARP	EIA/ IEE	DD	PA	CB	O&M	SAS	PPTA	POR
TA 3401	Transport Sector Restoration	2000	2002	1,000,000	ADB–JSF						●				
TA 3731	Transport Sector Improvement	2001	2006	500,000	ADB–JSF						●	●			
TA 7100	Preparing the Road Network Development	2008	2009	800,000	ADB–JSF	200,000	●	●						●	
TA 7698	Supporting the Road Network Development	2010	2012	225,000	ADB–JFPR					●	●				
			Total	**2,525,000**	–	**200,000**									

ADB = Asian Development Bank; CB = capacity building; DD = detailed design; EIA = environmental impact assessment; IEE = initial environmental examination; JFPR = Japan Fund for Poverty Reduction; JSF = Japan Special Fund; LARP = land acquisition and resettlement plan; O&M = operation and maintenance; PA = procurement assistance; POR = policy reform; PPTA = project preparatory technical assistance; SAS = sector assessment and strategy.

Source: Asian Development Bank (Pacific Department).

APPENDIX 5: LIST OF LINKED DOCUMENTS

1. ADB. Road Network Upgrading Sector Project
   https://www.adb.org/projects/46260-002/main.

2. ADB. Road Network Upgrading Project
   https://www.adb.org/projects/45094-001/main.

3. ADB. Infrastructure Management
   https://www.adb.org/projects/46156-001/main.

4. ADB. Supporting Road Network Development
   https://www.adb.org/projects/43322-032/main.

5. ADB. Our Roads Our Future–Supporting Local Governance and Community-Based Infrastructure Works
   https://www.adb.org/projects/43322-022/main.

6. ADB. Road Network Development Sector Project
   https://www.adb.org/projects/43322-012/main.

7. ADB. Preparing the Road Network Development Project
   https://www.adb.org/projects/38618-022/main.

8. ADB. Transport Sector Improvement
   https://www.adb.org/projects/34402-012/main.

Timor-Leste Transport Operations

This publication examines the development assistance of the Asian Development Bank since Timor-Leste gained independence in 2002. Milestones in nation-building and activities of development partners from around Asia and the Pacific are chronicled. Timor-Leste's prospects hinge on prudent and effective use of the savings from petroleum production to finance investments in the physical capital, human capital, and institutions needed to develop a sustainable economy.

About the Asian Development Bank

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 67 members—48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

ADB

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