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ASIAN NATIONS

# PROJECT BRIEFS FOR SELECTED PPP PROJECTS

ASEAN PUBLIC-PRIVATE PARTNERSHIP (PPP) PROGRAMME

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The ASEAN Secretariat
Jakarta

The Association of Southeast Asian Nations (ASEAN) was established on 8 August 1967. The Member States of the Association are Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam.
The ASEAN Secretariat is based in Jakarta, Indonesia.

For inquiries, contact:
The ASEAN Secretariat
Community Relations Division (CoRD)
70A Jalan Sisingamangaraja
Jakarta 12110
Indonesia
Phone : (62 21) 724-3372, 726-2991
Fax : (62 21) 739-8234, 724-3504
E-mail : public@asean.org

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ASEAN: A Community of Opportunities

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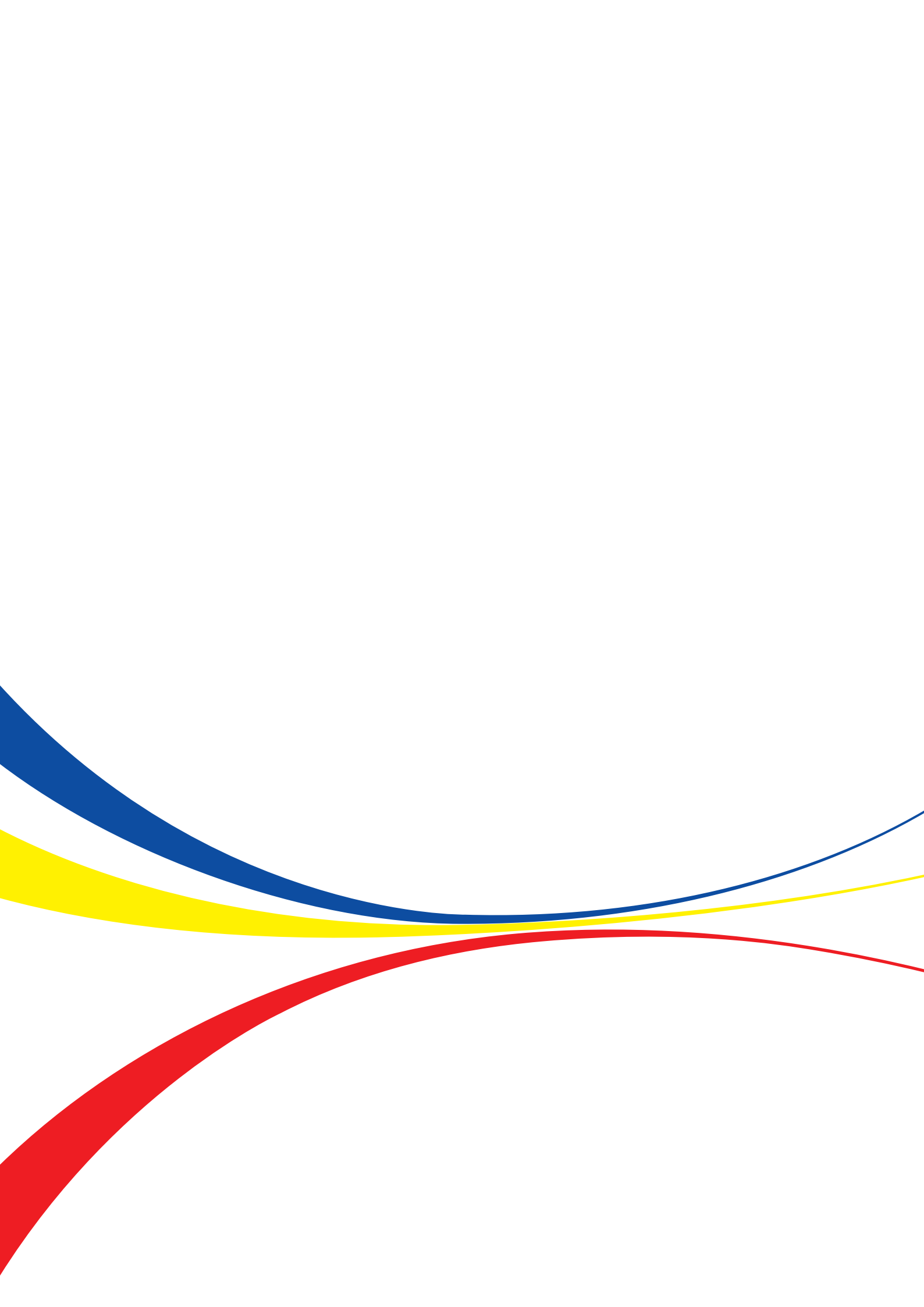
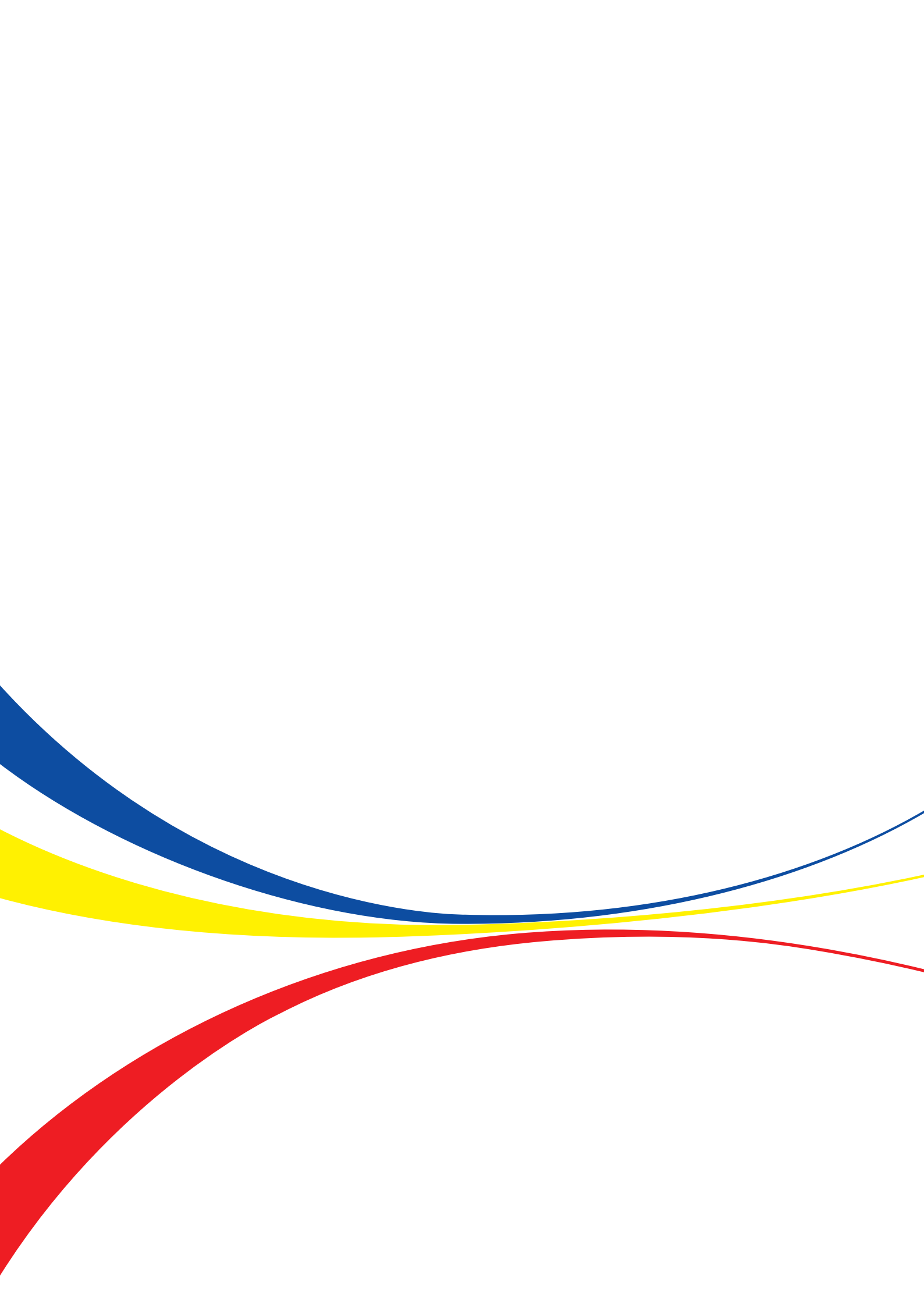


# Introduction



# 1. Introduction

This report summarizes the project briefs of eight (8) short listed ASEAN projects to be potentially implemented under various schemes of public-private partnerships (PPP) resulting from the ASEAN PPP Programme.

The projects presented include:

- Bien Hoa – Vung Tau Expressway (Viet Nam)
- Central Luzon Link Expressway (Philippines)
- Kanchanaburi – Phu Nam Ron Motorway (Thailand)
- Laos Road No. 3: ASEAN Highway No. 3 (Lao PDR)
- Makassar Port (Indonesia)
- Manado – Bitung Toll Road (Indonesia)
- North Luzon Expressway East Project (Philippines)
- Trans-Sumatra Toll Road: Kayu Agung – Betung (Indonesia)

The short listed projects were derived from regional and national infrastructure priority pipelines which were subjected to selection methodologies covering a range of criteria pertaining to strategic relevance, level of project development, project feasibility, complexity of implementation and fiscal impact. The short-listing process was conducted through desk review of projects based on available information and consultations with concerned public and private sector officials from the Member States, multilateral and bilateral development organizations and other relevant information sources.

The project briefs were developed under the auspices of the ASEAN Connectivity Coordinating Committee (ACCC). The project briefs were developed by the World Bank with assistance from Mott MacDonald, an engineering and development consultancy firm, through the support of the ASEAN-Australia Development Cooperation Programme Phase II (AADCP II).

Disclaimer

This report is produced as a guide for potential investors and interested parties to better understand priority infrastructure pipeline projects in ASEAN for potential PPP implementation. The findings, interpretations, and analysis in this Report should be treated with care, as work on the ASEAN PPP agenda and some of the identified projects is on-going.

The ASEAN Secretariat and World Bank have taken due diligence in the preparation of this document. However, they shall not be held liable for any omission or inaccuracy in the content. The ASEAN Secretariat, the World Bank, Mott MacDonald, and the Government of Australia will not accept any liability for any claims, loss or expenses that may arise from the use of information in this document. Reliance on the information is at the user's sole risk and responsibility.

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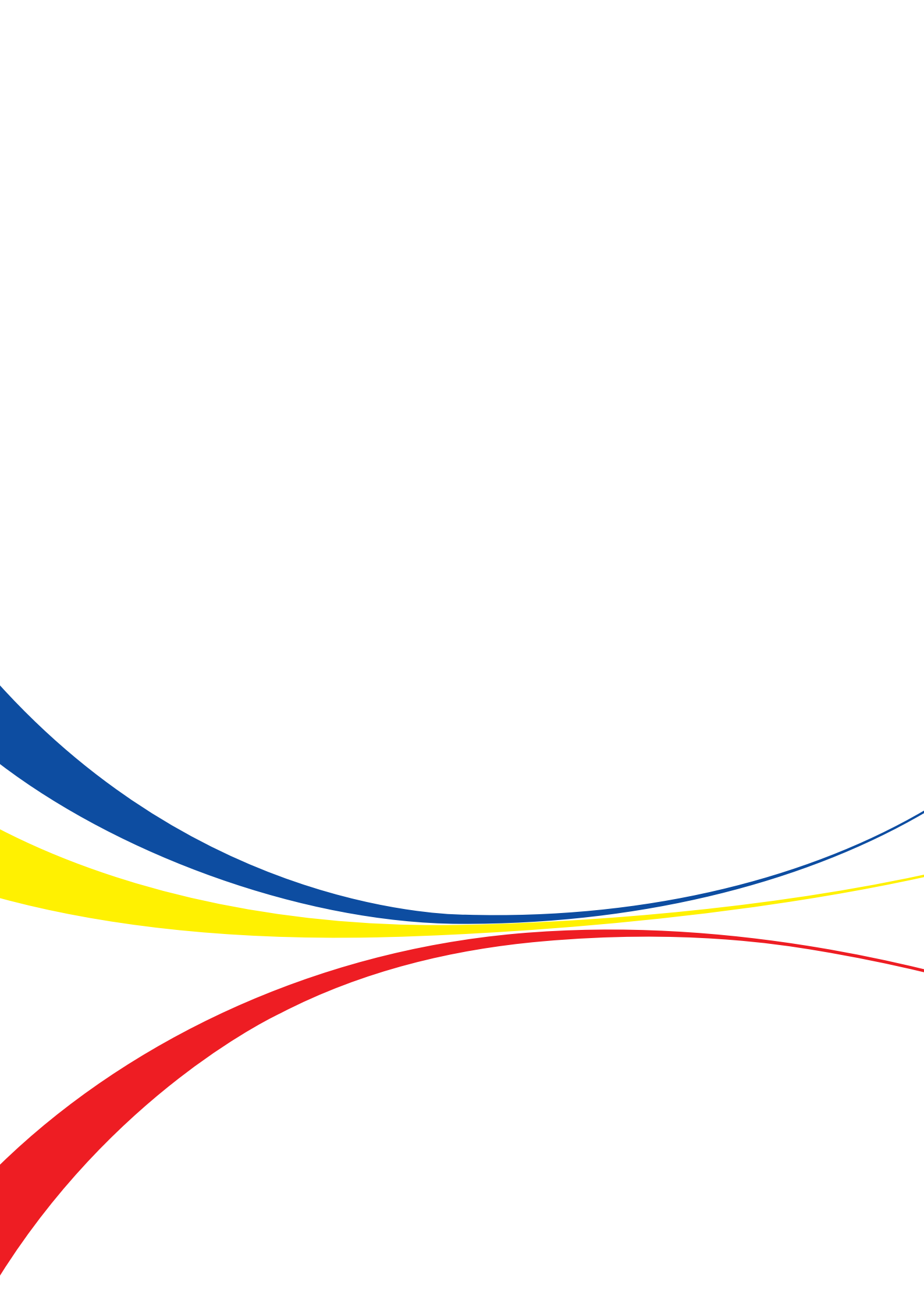
# Project Selection Process



# 2. Project Selection Process

## 2.1 Long List Development

Between October and December 2014, the World Bank (WB) team, supported by the ASEAN Connectivity Division, assessed each Member State's specific infrastructure connectivity list with officials from sectoral, planning, and other relevant government agencies, following the Selection Methodology 1 (SM1) developed for this project. This initial "Universe" list of connectivity projects that was assessed was drawn from the Master Plan on ASEAN Connectivity (MPAC), country infrastructure lists and an Economic Research Institute for ASEAN and East Asia (ERIA) study carried out for ASEAN.

The following table, reproduced from the ASEAN PPP Programme Interim Report, details the SM1 criteria.

**Table 1: Selection Methodology 1**

| Category | Specific Criterion | Y/N |
|---|---|---|
| Strategic Relevance | Is the project included in **MPAC**? | At least one to be Yes to meet Strategic Relevance criteria |
| | Is this project included in an **ASEAN sectoral initiative**? (e.g. Brunei Action Plan, ASEAN ICT Masterplan) | |
| | Does the project **enhance** an MPAC/ASEAN sectoral initiative project? | |
| Level of Project Development | Is this a **tangible** infrastructure project? | Each criterion to be met |
| | Is there a **supportive enabling environment** to push the project forward? | |
| | Is the project at the **pre-bidding stage** and will it **seek private financing**? | |
| | Is the project **live**? | |
| Project Feasibility | Has the **technical feasibility** of the project been established? | Each criterion to be met |
| | Has the **financial feasibility** of the project been established? | |
| | Are **all other information** needed to establish project feasibility available? | |

During the country consultations, the WB team focused on understanding whether there was a supportive environment for the projects, as governmental support is one of the most critical factors for an infrastructure project to progress. The team researched each Member State's national connectivity agenda, infrastructure priorities and constraints and confirmed these during the country consultations.

Once the national priorities were established, each project identified was assessed and prioritized based on information received from government agencies. Projects that were identified by officials as high or medium priority were deemed to have a supportive enabling environment in terms of government support. These projects were further screened to assess strategic relevance to ASEAN connectivity, level of project preparation and development, and potential technical, financial, environmental, social, legal, and other issues.

The long-listing process yielded an initial 40 potential PPP projects. Based on developments on the status of each of the projects, the Long List was eventually pared down to 29 projects.

## 2.2 Short List Development

Following the initial screening of the "Universe" List, the 29 projects were then subjected to further screening using Selection Methodology 2 (SM2). The aim of SM2 was to develop a ranking of projects, of which the top ten ranked projects would be further analysed. With the conclusion of both rounds of connectivity consultations, one in late 2014 and the other from July to August 2015, the WB team, together with Mott MacDonald, an engineering consultancy firm, has developed overall rankings for the Short List of projects using the following criteria:

**Table 2: Criteria used to obtain the Short List (SM2)**

| Criterion | What does it measure? | Weight | Ranking sub-categories |
|---|---|---|---|
| Strategic Fit | Fit with ASEAN Connectivity and support from ASEAN and the ASEAN Member State | 20% | • Fit with country priorities<br>• Support from ASEAN Member State<br>• ASEAN Connectivity Relevance |
| Readiness of Project | Degree of preparation and level of information on the project | 20% | • Degree of preparation and progress of project<br>• Overall PPP Enabling Environment |
| Complexity of Implementation | Ease of moving to project structuring, procurement, financing, and implementation within a timeframe of 3-5 years | 40% | • Technical feasibility<br>• Land ownership<br>• Legal & regulatory environment<br>• Consensus among stakeholders<br>• Investor Interest |
| Fiscal Impact of Project | Ability of the project to generate sufficient income to meet its financial obligations | 20% | • Evidence of demand<br>• Third party revenue opportunities |

In addition to ranking projects based on the above criteria, the WB team also took into account ASEAN's request to include projects from Cambodia, Lao PDR, Myanmar and Vietnam in the Short List if possible.

Based on the above the Short List of projects is as follows:

1. Kanchanaburi – Phu Nam Ron Motorway
2. Manado-Bitung Toll Road
3. Central Luzon Link Expressway
4. NLEX East Expressway
5. Trans-Sumatra Toll Road: Kayu Agung – Betung
6. Bien Hoa – Vung Tau Expressway
7. Bitung Port
8. Makassar port
9. Laos Road No. 3: ASEAN Highway No. 3 (Boten-Nateuy-Houayxay)
10. Development of port facilities along the Mekong, Basac, Tonlesap rivers

This Short List of projects was endorsed by the ACCC in June 2015.

## 2.3 Analysis of Short List projects

Following the endorsement of short list, project briefs and roadmaps were developed. These project briefs and roadmaps contain a preliminary analysis of the technical and financial suitability of the projects for private investment based on the information gathered during these consultations as well as continued analysis from the team.

To provide the team with the necessary technical expertise, the WB contracted Mott MacDonald, to work with the team to review all information obtained for each of the Short Listed projects. Such information included feasibility studies, business cases and other materials provided by country governments regarding the projects.

However, it was not possible to conduct a meaningful analysis of the following two projects in the same way as the other eight, due to the lack of information:

1. Development of port facilities along the Mekong, Basac, Tonlesap rivers
2. Bitung Port

The table below shows the list of materials that the WB team relied on to conduct the assessment of the remaining Short List projects:

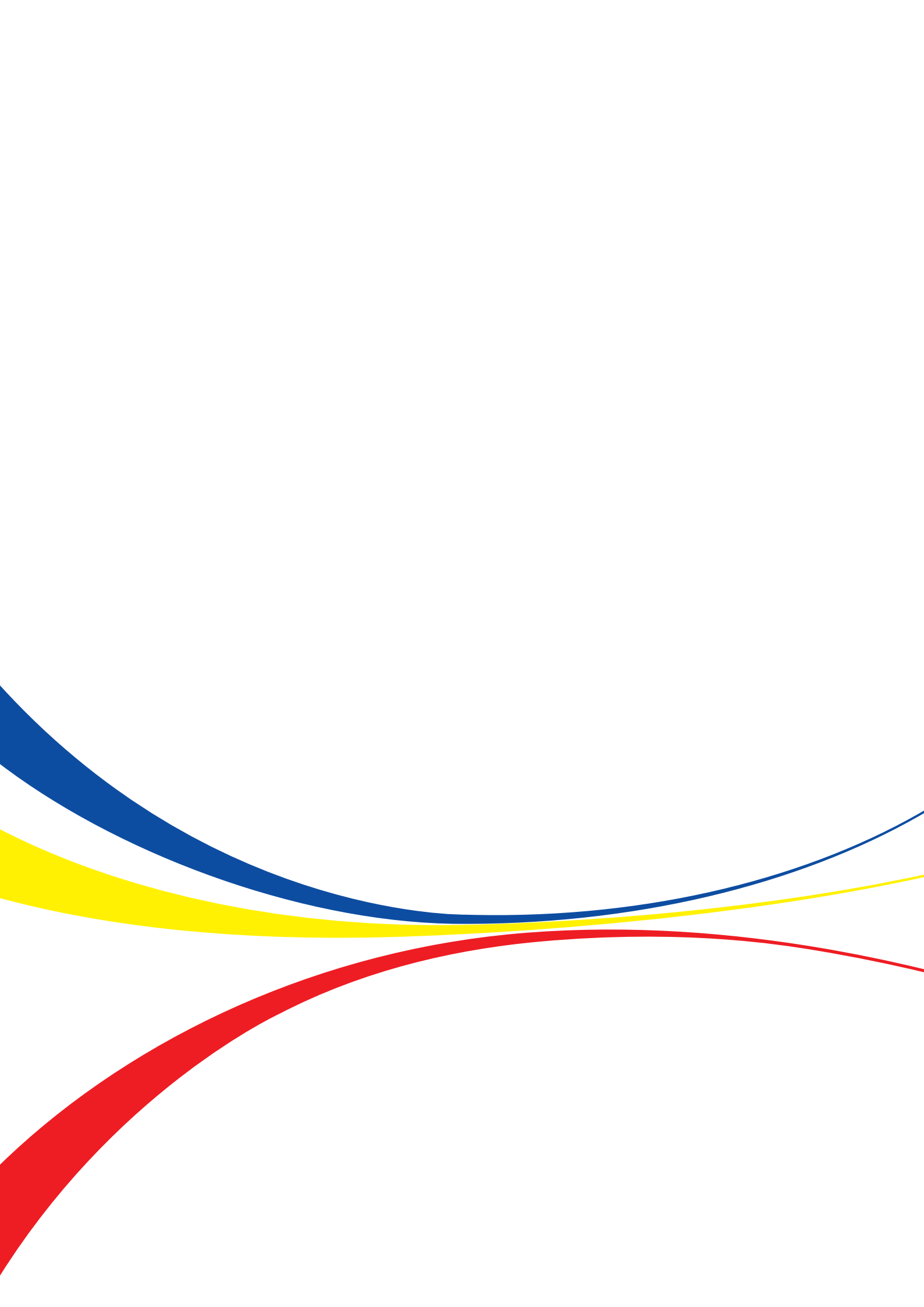
**Table 3: List of Documents Reviewed**

| Project Name | Documents reviewed |
|---|---|
| Bien Hoa – Vung Tau Expressway | • Bien Hoa − Vung Tau Expressway Construction Project: Preparation of Project Proposal, TEDI, 2015<br>• The Preparatory Survey on Bien Hoa − Vung Tau Expressway Project, Final Report, JICA, 2013 |
| Central Luzon Link Expressway | • Business case study of selected PPP Projects: CLLEX Phase 2, by F. Cancio and Associates in Assoc. with FDCCE&A, CO.& URBAN ENGINEERS, 2013<br>• CLLEX Phase 2 and Operation and Maintenance of Phases 1 and 2 - Project Brief, by DPWH, 25 May 2015 |

| Table 3: List of Documents Reviewed (cont.) | |
|---|---|
| **Project Name** | **Documents reviewed** |
| Kanchanaburi – Phu Nam Ron Motorway | • Draft Final Traffic analysis – DOH, by TESCO, TRANSCON and NEW ASSET<br>• Draft Final Financial Evaluation – DOH, by TESCO, TRANSCON and NEW ASSET<br>• Draft Final EIA – DOH, by TESCO, TRANSCON and NEW ASSET<br>• Draft Final Public Consultation – DOH, by TESCO, TRANSCON and NEW ASSET |
| Laos Road No. 3 (ASEAN Highway No. 3) | • No studies have been conducted recently.<br>• The assessment below has been based mainly on the information gathered during in-country consultations with MPWT. |
| Makassar Port | • 2013 Makassar Port Development Master Plan by MOT<br>• Presentation material on Makassar Port Development by MOT dated April 2015<br>• Presentation material on Makassar Port development by Pelindo IV<br>• Pre-feasibility study of Makassar New Port Phase 1 funded by AusAID, Consultant's Technical Report, 2014 |
| Manado – Bitung Toll Road | • BPJT: Manado Bitung Toll Road project Brief<br>• Feasibility Study (FS) conducted by local government of North Sulawesi in 2010 |
| North Luzon Expressway East | • Consultancy Services for conducting business case studies of selected PPP Projects: Package II (NLEX-EAST), Phases 1 and 2 – Draft Final Report (revised), by DPWH, 2013 (OBC)<br>• NLEX East Phases 1 and 2 - Project Brief, by DPWH, 25 May 2015 |
| Trans-Sumatra Toll Road | • BAPPENAS: Kayu Agung – Palembang – Betung Toll Road project Brief<br>• Bina Marga: Progress of the Trans Sumatra Toll Road and Manado Bitung Toll Road<br>• Feasibility Study (FS) conducted by PT. Sriwijaya Markmore Persada in 2013 |

ASEAN PPP Pipeline Project Information Documents

# 1. BIEN HOA-VUNG TAU EXPRESSWAY PROJECT (VIET NAM)



# 1. BIEN HOA-VUNG TAU EXPRESSWAY PROJECT (VIET NAM)

## Project Summary

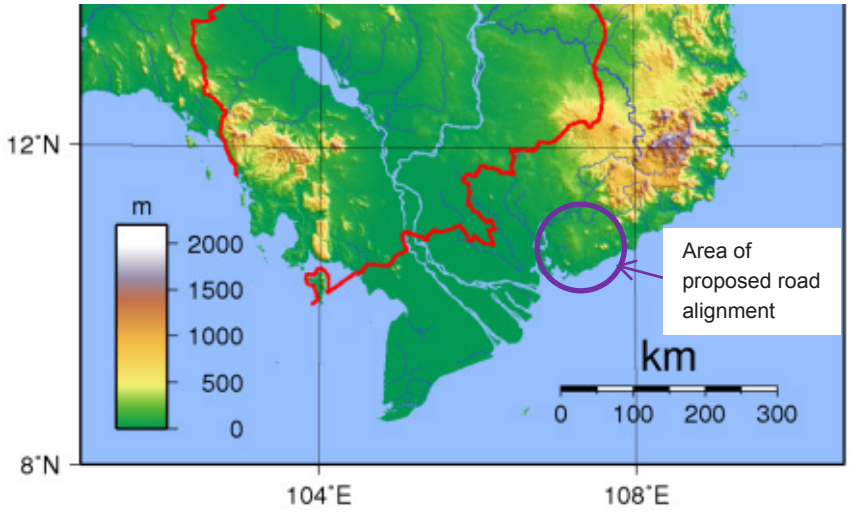



*Figure 1: Project Location in Dong Nai and Ba Ria - Vung Tau Provinces, Southern Viet Nam*

| **Project Details** | | |
|---|---|---|
| **Project Cost** | **Duration** | **Project Implementing Agency** |
| Section I (full): VND 13 trillion | 25-30 years | Ministry of Transport (MOT) |
| **Summary of Project** | | |
| Construction and Operations & Maintenance of Sections I and II. Scope to be decided by the MOT. | | |
| Intended Procurement Method | • Preliminary approval has been given by the Prime Minister to procure the project as a PPP (Build-Operate-Transfer). The funding structure and implementation arrangements will be finalised with the completion of the feasibility studies.<br>• The government projects that the project will be procured by the end of 2016. | |
| **Project Background** | | |
| Relevance to country and ASEAN connectivity | • The proposed expressway is located in the Southern Key Economic Zone and is intended to connect Ho Chi Minh City's suburban industrial centres in Dong Nai Province with the Cai Mep - Thi Vai international deep sea ports, and to provide relief to National Highway 51, which is forecast to operate over capacity by 2030. | |
| Scope of Overall Project | • Phase 1: Construction of Section I Bien Hoa to Cai Mep – Thi Vai ports as 4 lane road. This phase is aimed to be completed by 2020.<br>• Phase 2: Construction of Section II Tan Thanh IC to Vung Tau as 4 lane road and widening of Section I to 6-8 lanes in certain locations. This phase is to be considered after 2030. | |

| Project Details (cont.) | |
|---|---|
| **Project Background** | |
| Proposed Structure | • Build-Operate-Transfer for Phase I of the expressway, where it is proposed that the private sector shall take traffic/revenue risk.<br>• The government will not provide any form of guarantees (except for some special circumstances with PM's allowance) |
| Further considerations | • The government needs to define what the scope of the project will be, as it will affect its attractiveness to the private sector.<br>• The GoV will also need to decide on what form of support will be provided to the project, address whether it will absorb costs such as land acquisition and right-of-way, and provide any form of guarantee with regard to traffic, revenues, toll adjustment, etc. |

## Full Project Report

### 1.1 Project Scope


*Figure 2: Diagram of intended Bien Hoa − Vung Tau Expressway project*

A preparation study was conducted by the Japan International Cooperation Agency (JICA) in 2013, and a Feasibility Study (FS) is currently being carried out by MOT's appointed local consultant, Transport Engineering Design, Inc. (TEDI). The following table summarises some key technical characteristics of the overall project.

.

| Table 1.1: Project Technical Characteristics | | | | |
|---|---|---|---|---|
| **Section** | **Section I** | | **Section II** | |
| Subsection | Bien Hoa to Tan Thanh IC | Tan Thanh IC to Cai Mep – Thi Vai ports | Tan Thanh IC to coastal road of Vung Tau | Coastal road of Vung Tau to Highway 51C |
| Length | 38km | 9km | 28km | 2.8km |
| Road class | Expressway | National Highway Class II | Expressway | Urban Road |
| Design Speed | 100km/h | 80km/h | 100km/h | 80km/h |
| Lanes set-up:<br>Phase 1<br>Phase 2 | <br>4<br>6-8 | <br>4<br>6 | <br>-<br>4 | <br>-<br>4 |
| Lane width (full) | 3.75m | 3.75m | 3.75m | 3.75m |
| Lane width (reduced) | 3.5m | 3.5m | - | - |

*Sources: MOT*

Based on the results of the FS which indicated that the financial viability of Phase 1 development (construction of 4 lane Section I) was stretched, TEDI recommended a revised technical scope for Phase 1 as follows:

- Operation design: 80km/h (the geometric elements are in accordance with the standards on expressway and the design speed of 100km/h);
- Lane width: 3.5m;
- One emergency stop location is arranged at an interval of every 5-6 km.

## 1.2 Traffic Projections and Preliminary Assessment

The table below gives preliminary projections of traffic for the intended Bien Hoa-Vung Tau Expressway:

| Table 1.2: Annual average daily traffic forecast (Passenger Car Unit or PCUs) | | | | | | |
|---|---|---|---|---|---|---|
| **Section** | **Section I** | | | | | **Section II** |
| **Forecast Year** | **Bien Hoa – Long Thanh IC** | **Long Thanh IC – Tan Hiep IC** | **Tan Hiep IC – Tan Thanh IC** | **Tan Thanh IC – Cai Mep – Thi Vai** | **Implied average growth pa** | **Tan Thanh IC to Vung Tau** |
| 2018 | 18171 | 35466 | 21966 | 10625 | | 15316 |
| 2019 | 19761 | 38289 | 24109 | 11290 | *8%* | 17023 |
| 2020 | 21489 | 41336 | 26460 | 11996 | *8%* | 18920 |
| 2021 | 23594 | 43196 | 28659 | 13677 | *9%* | 19963 |
| 2022 | 25906 | 45139 | 31040 | 15593 | *9%* | 21063 |

| Table 1.2: Annual average daily traffic forecast (Passenger Car Unit or PCUs) (cont.) | | | | | | |
|---|---|---|---|---|---|---|
| **Section** | **Section I** | | | | | **Section II** |
| **Forecast Year** | **Bien Hoa – Long Thanh IC** | **Long Thanh IC – Tan Hiep IC** | **Tan Hiep IC – Tan Thanh IC** | **Tan Thanh IC – Cai Mep – Thi Vai** | **Implied average growth pa** | **Tan Thanh IC to Vung Tau** |
| 2023 | 28444 | 47169 | 33620 | 17778 | *9%* | 22223 |
| 2024 | 31230 | 49292 | 36414 | 20270 | *9%* | 23448 |
| 2025 | 34290 | 51509 | 39440 | 23110 | *9%* | 24740 |
| 2026 | 37098 | 56338 | 42799 | 23773 | *7%* | 27631 |
| 2027 | 40136 | 61620 | 46443 | 24454 | *7%* | 30860 |
| 2028 | 43422 | 67398 | 50399 | 25155 | *7%* | 34466 |
| 2029 | 46978 | 73717 | 54691 | 25876 | *7%* | 38494 |
| 2030 | 50825 | 80628 | 59348 | 26618 | *7%* | 42992 |
| 2031 | 52722 | 81918 | 60022 | 28075 | *3%* | 44488 |
| 2032 | 54689 | 83229 | 60704 | 29612 | *3%* | 46037 |
| 2033 | 56731 | 84560 | 61393 | 31233 | *3%* | 47639 |
| 2034 | 58848 | 85913 | 62091 | 32943 | *3%* | 49297 |
| 2035 | 61044 | 87288 | 62796 | 34747 | *3%* | 51013 |

A traffic forecast was developed based on a 2014 traffic survey. The traffic forecast projects a relatively high amount of traffic starting from the year of operation on Section I of the expressway. The details of the forecast methodology have not been available for review. However, there is evidence suggesting a positive outlook for the forecast traffic.In the recent Bien Hoa – Vung Tau expressway preparatory study conducted by JICA in 2013, the traffic forecast was developed following a comprehensive methodology, and the magnitude of the projected demand appears similar (or for some sections even higher) to the forecast developed by TEDI. The implied annual average traffic growth rates appear plausible considering that, according the to the General Statistics Office of Vietnam, road passenger and freight traffic have been increasing at an average of 11% and 15% per year, respectively, over the period of 2002-2012.

The sustained economic growth of the country is expected to contribute to traffic growth. The World Bank forecasts that the 6% GDP growth posted in 2014 will gradually increase to 6.5% by 2017. The Southern Key Economic Zone, where the project lies, which reported the highest economic growth rate in the country (12%), will continue to surpass the national average. Local investors, who were consulted on the project, expressed confidence in the traffic demand for Section I.

On Section I the majority of the traffic is reported to comprise trucks, followed by cars and buses. On Section II, cars dominate, followed by buses and trucks. This appears logical as Section I would mostly serve industrial users, while Section II would cater mostly for tourist trips. Generally, higher number of trucks represents higher potential for revenue generation.

The FS concluded financial viability of Section I assuming base toll rate of VND 1,500 per car/km with an increase by 12% every 3 years. Potential investors would assess the risks and consequences of the tariff adjustment not being enforced, on time, as this would significantly affect project revenues and financial viability.

For Section II Tan Thanh IC to Vung Tau (which is to be developed in Phase 2 after 2030), both the TEDI and JICA studies have concluded that project is economically attractive and viable. However, given the forecasted traffic levels and mix, the financial feasibility of Section II may need to be enhanced with other forms of support than just tolls collected from the traffic.

There are a number of current and planned transport infrastructure projects in the vicinity of the proposed expressway, which would have direct and indirect impacts on the level of the expressway traffic. Some of the key projects include the new Long Thanh International Airport and Bien Hoa – Vung Tau railway, the Ben Luc – Long Thanh Expressway (currently under construction), and the Cai Mep – Thi Vai interport roads. Realisation of some of these projects will contribute to the expressway traffic level, while others are competing routes and once in operation will result in reduction of traffic levels for Bien Hoa-Vung Tau.

## 1.3 Costs and Preliminary Assessment

Potential investors will need to carry out their own due diligence to assess the project against their own investment hurdles. The below cost estimates are provided on an indicative basis.

Table 1.3 below presents the total investment cost estimate for Section I (revised scope) of Bien Hoa – Vung Tau Expressway project as given in the feasibility study by TEDI and adjusted to real 2016 VND/USD prices. Total estimated project investment cost is US$ 381 million.

**Table 1.3: Project Cost Estimates for Section I (Phase 1) (updated as of June 2016)**

| Cost Item | VND million (2015 prices) | USD million (2015 prices) | Implied percentage share |
|---|---|---|---|
| Construction and equipment cost | 3,589,918 | 164 | 43% |
| Ground clearance and resettlement cost | 3,175,964 | 145 | 38% |
| Project management, consultation, and other costs | 538,488 | 24.6 | 6.6% |
| Contingencies | 1,032,514 | 47.2 | 12.4% |
| | | | |
| | | | |
| **Total** | **8,336,883** | **381** | 100% |

*Sources: TEDI*

The cost for Section I Phase 2, of expanding from 4 to 6-8 lanes from Bien Hoa to Cai Mep-Thi Vai ports, is estimated at USD 331 million with land acquisition cost of $39.3 million.

| Table 1.4: Project Cost for Section I (Phase 2) (updated as of June 2016) | | | |
|---|---|---|---|
| **Cost Item** | **VND million (2016 prices)** | **USD million (2016 prices)** | **Implied percentage share** |
| Construction cost and equipment cost | 4,443,902 | 203 | 61% |
| Ground clearance and resettlement cost | 859,114 | 39.3 | 12% |
| Project management, consultation and other costs | 666,585 | 30.4 | 9% |
| Contingencies | 1,278,133 | 58.3 | 18% |
| | | | |
| | | | |
| **Total** | **7,247,734** | **331** | - |

*Sources: TEDI*

The above investment cost estimate appears to exclude cost of financing.

Table 1.5 summarizes the operation and maintenance costs assumptions.

| Table 1.5: Assumptions for O&M costs for Phase 1 | | |
|---|---|---|
| **Item** | **Unit** | **Value** |
| **Regular repair cost** | | |
| Roadwork | % of CapEx of road surface | 0.55% |
| Bridgework | %/ of CapEx of a structure | 0.1% |
| **Medium Repair cost** | | |
| Roadwork, 5 year interval | % of CapEx of road surface | 5.1% |
| Bridgework, 5 year interval | % of CapEx of a structure | 1% |
| **Overall repair** | | |
| Roadwork, at interval 15 years | % of CapEx of road surface | 42% |
| Bridgework, at interval 15 years | % of CapEx of a structure | 2% |
| **Project management and operation cost** | | |
| **1st year of operation** | VND billion (USD million) per toll gate | 1.25 (0.56) |
| **From 2nd year of operation** | % increase | 4% |

*Sources: TEDI*

## 1.4 Intended and Proposed Structure

MOT intends to procure Bien Hoa – Vung Tau expressway as a BOT model, i.e. the private sector would finance, design, construct and operate and maintain the expressway. BOTs have been successfully implemented in Vietnam in the toll road sector, albeit with domestic investors, including State Owned Enterprises, and, in certain cases, with sovereign and MIGA guarantees (i.e. NH20).

In the proposed BOT model for Bien Hoa-Vung Tau, the private company would finance, design, construct and operate and maintain the expressway on behalf of the MOT. The private company will ideally be a joint venture (JV) between a foreign and a local company, as foreign investors can bring skills and experience, while a local company will facilitate dialogue with the government agencies and help overcome regulatory barriers. The company would be given the right to charge and collect toll revenues from the road users to recover its investment cost.

Normally, the private investor is expected to pay the costs of compensation, site clearance and resettlement unless authorities commit to the payment of these costs. For the Bien Hoa Vung Tau expressway project, the private investor will bear the cost of compensation, site clearance and resettlement. The Government will not provide Viability Gap Funding (VGF) and will aim to establish an optimal s tructure for the project to minimize the need for government support.

## 1.5 Any Technical Issues

The technical consultant assesses that no exceptional technical issues are currently encountered that a competent and experienced designer, contractor and operator will not be able to manage and overcome.

## 1.6 Other Relevant Issues

More robust revenue and cost estimates are needed to increase the reliability of assessments.

## 1.7 Further action needed

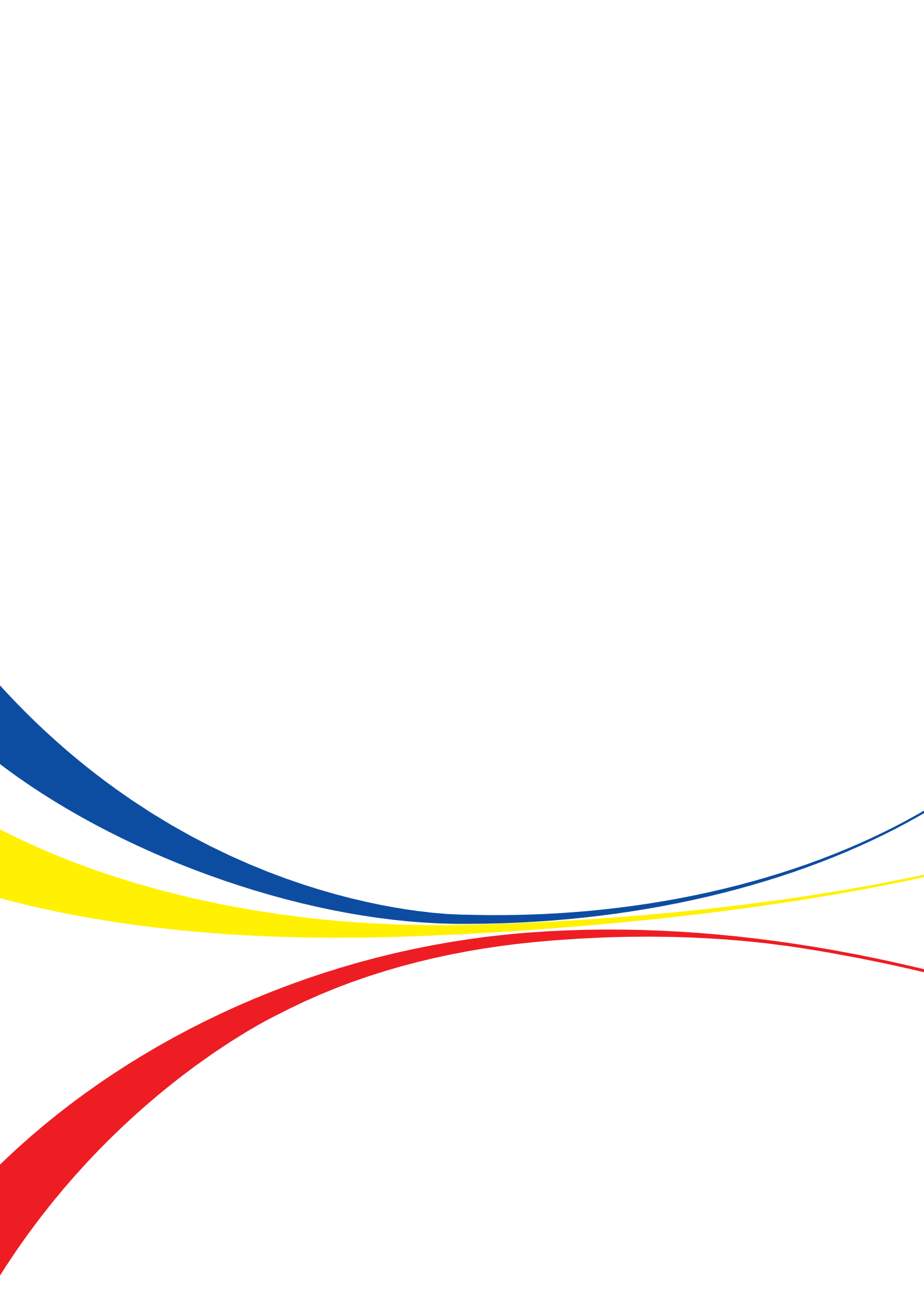
The following table lists the actions that need to be taken for the project to progress as a PPP:

**Table 1.6: List of actions to take for PPP**

| Potential Issue | Responsibility and recommended action | Timeframe |
|---|---|---|
| Define the scope of PPP contract | MOT | Before the bid stage |
| Review of the proposed bridge structure span arrangement, especially for Section II, where the proposed underpasses bridge length seem to be extremely long | MOT | Before the bid stage |
| Conduct sensitivity testing of commercial viability due to various risk factors | MOT/ private investor | Before the bid stage |
| Make decision on provision of government support | Various government agencies with the help of IFIs | Before the bid stage |
| Land acquisition to be completed | Government/ private investor | Minimum 70% before the construction |

*Source: Mott MacDonald's analysis*

# 2. CENTRAL LUZON LINK EXPRESSWAY (CLLEX) (PHILIPPINES)



# 2. CENTRAL LUZON LINK EXPRESSWAY (CLLEX) (PHILIPPINES)

## Project Summary

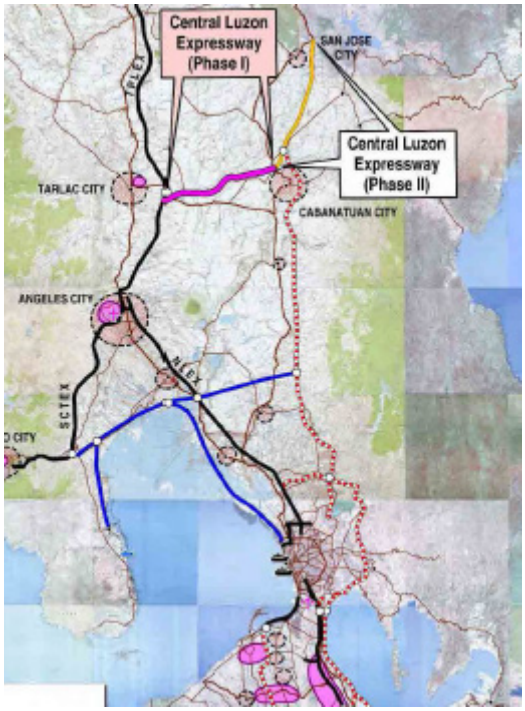



*Figure 1: Project Location in North Mega Manila, Philippines*

| **Project Details** | | |
|---|---|---|
| **Project Cost** | **Duration** | **Project Implementing Agency** |
| Phase II CAPEX: PHP 8.5 billion<br><br>Phase I & II OPEX: PHP 6.6 billion | 30 years from Phase I COD | Department of Public Works and Highways (DPWH) |
| **Summary of Project** | | |
| The project involves the construction of Phase II of CLLEX, as well as the Operations & Maintenance of both Phase I & II. | | |
| Intended Procurement Method | • Build-Transfer-Operate, where the private sector takes traffic/revenue risk.<br>• Phase I is expected to be financed via Official Development Assistance and procured as a Design-Build contract with help from JICA[1]. | |

[1] As of 9 March 2016, the PPP Centre of the Philippines updated that the DPWH was intending to publish the invitation to bid for the procurement of Transaction Advisors to conduct Feasibility Studies and bidding.

| Project Details (cont.) | |
|---|---|
| **Project Background** | |
| Relevance to country and ASEAN connectivity | • The Philippines suffers from an infrastructure deficit and high logistics costs.Nueva Ecija, where the project is located, is widely known as the "Food Bowl and Rice Granary of Central Luzon". Construction of the highway will enable better access for agriculture producers to markets. |
| Scope of Toll Road | • CLLEX Phase 2 is a proposed four-lane, 35.7km toll road. Phase 2 will connect Cabanatuan City to San Jose City in Nueva Ecija Province, running in a north-south direction.<br>• CLLEX Phase 1 is a four-lane, 30.7-km expressway that is planned to diverge out of Subic–Clark–Tarlac Expressway (SCTEX). The project is planned to start from Tarlac then traversing through Central Luzon in the east-west direction and end in Cabanatuan City. |
| Proposed Structure | • Build-Transfer-Operate, where the private sector takes traffic/revenue risk. |
| Further considerations | • The inability of tariffs to be raised has been raised as a key concern by private investors affecting their willingness to participate. The Government of the Philippines (GoP) should take this into consideration when gauging the attractiveness of the project to the private sector.<br>• The private sector will have to take into account the variability in traffic arising from the construction of NLEX East in the future, as this is projected to have a negative impact on traffic for CLLEX that is difficult to quantify at this stage. |

# Full Project Report

## 2.1 Project Scope

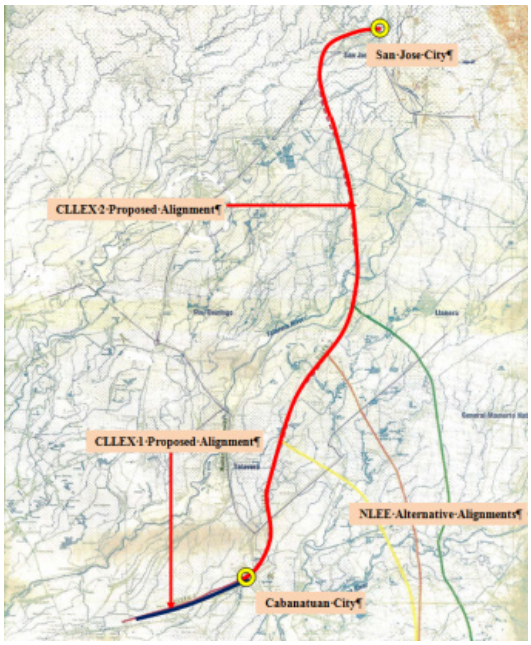



*Figure 2: Diagram of intended CLLEX project*

The following table summarises some key technical characteristics of the project.

**Table 2.1: Technical characteristics of project**

| Elements | Characteristic Phase 1 | Characteristic Phase 2 |
|---|---|---|
| Length | 30.7 | 35.7 km |
| Lane set up | 2 x 2 | 2 x 2 |
| Road Width/ lane | 3.65 m | 3.65 m |
| Design Speed | 100 km/h | 100 km/h |
| Bridges | 7 | 22 |
| Overpass/ underpass | 38 | 28 |
| Interchanges | 5 | - |
| Construction Duration | - | 5 years |
| Concession duration | | 34 years |

*Source: Department of Public Works and Highways*

## 2.2 Traffic Projections and Preliminary Assessment

A traffic survey report has been prepared as part of the Outline Business Case (OBC). The analysis has been based on the traffic database from the Study of Master Plan on High Standard Highway Network Development (JICA 2010), with additional information obtained using methods such as roadside origin-destination interviews, new traffic counts and surveys. JICA's System for Traffic Demand Analysis (STRADA) model has been used to create the demand model for the project.

Table 2.2 below gives preliminary projections of traffic for the intended Central Luzon Link Expressway:

**Table 2.2: CLLEX traffic forecast[2]**

| Section | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tarlac - Aliaga | 36,725 | 37,719 | 38,714 | 39,707 | 40,701 | 41,696 | 42,690 | 43,684 | 44,677 | 45,672 | 46,666 |
| Aliaga - Cabanatuan | 30,577 | 31,320 | 32,064 | 32,807 | 33,550 | 34,295 | 35,038 | 35,781 | 36,524 | 37,268 | 38,011 |
| Cabanatuan - Llanera | 22,571 | 23,196 | 23,821 | 24,447 | 25,071 | 25,697 | 26,321 | 26,946 | 27,571 | 28,197 | 28,821 |
| Llanera - San Jose | 8,246 | 8,374 | 8,501 | 8,630 | 8,758 | 8,886 | 9,013 | 9,141 | 9,270 | 9,397 | 9,525 |
| average traffic | 24,530 | 25,152 | 25,775 | 26,398 | 27,020 | 27,644 | 28,266 | 28,888 | 29,511 | 30,134 | 30,756 |
| Implied % annual increase | | 2.5% | 2.5% | 2.4% | 2.4% | 2.3% | 2.3% | 2.2% | 2.2% | 2.1% | 2.1% |

*Source: Outline Business Case*

The study results indicate the magnitude of traffic demand that is likely to be attractive to investors. However, certain aspects of the traffic projections need to be further assessed such as the reasons behind the traffic north of Llanera being only about 35% of that of south of Llanera. In the scope of this report, there no opportunity provided to review the traffic forecasts and counts.

It is noteworthy, that once the proposed NLEX East is implemented, this will be competing with the traffic on CLLEX and may have a negative impact. The CLLEX study estimates that NLEX East may lead to a decrease in future traffic on CLLEX by 20% to 50% depending on the expressway section. This is likely to reduce the profitability of the project in the later years of concession.

[2] Assumption: all other relevant committed on-going PPP Projects in place except NLEX East.

## 2.3 Costs and Preliminary Assessment

Potential investors will need to carry out their own due diligence to estimate costs and to assess the project against their own investment hurdles. The traffic and cost estimates are provided only on an indicative basis.

Table 2.3 presents the total investment cost estimate as given in the OBC conducted by the local consultant engaged by the DPWH.

**Table 2.3: Review of cost for CLLEX Phase 2 project**

| ***Costs*** | **PHP million** | **USD million** | **% of CAPEX** | **WB Comments** |
|---|---|---|---|---|
| General | 18 | 0.4 | 0.3% | The size and proportion appear reasonable for essentially Engineer facilities. |
| Earthworks | 3,061 | 67 | 52.1% | Considering the terrain, to have over 50% of CAPEX to be allocated for earthworks appears excessive. Also the rough benchmark value of nearly USD 2 million per kilometre appears on the high side. |
| Road construction | 820 | 18 | 14.0% | The proportion and the rough benchmark value of USD 0.5 million per kilometre appears to be on the low side. |
| Bridges | 1,600 | 35 | 27.2% | The size and proportion appears to be reasonable. |
| Drainage and slope protection | 24 | 0.5 | 0.4% | The size and proportion appear on the low side. |
| Miscellaneous | 207 | 5 | 3.5% | The size and proportion for signs, guard rails and markings appears reasonable. |
| Toll plaza and service area | 147 | 3.1 | 2.5% | The size and proportion appears to be reasonable. |
| **TOTAL** | **5,878** | **128** | **100%** | |
| 30% mark up | 1,763 | 38 | - | It is untypical for nearly 30% of CAPEX to be unaccounted for. Typically the costs are split into contracts the investor would sublet, such as construction and operation. The construction contract then further split into work packages that subcontractors will bid on. Similar considerations would be expected for the operation contract. |
| **TOTAL incl. mark-up** | **7,642** | **166** | - | Overall, as a rough benchmark, the overall CAPEX value of around USD 4.5 million per kilometreis considered to be within a reasonable range but on the low side. The estimate is recommended to reflect the typical construction cost composition. |

*Sources: Outline Business Case and Mott MacDonald analysis*

For the financial evaluation the following OPEX has been assumed: PHP 9.8 billion (USD 214m) for 34 years of operation or PHP 290 million (USD 6.3m) per annum.

These cost estimates have been adjusted for inflation to 2015 prices, and are summarised in the following table:

| Table 2.4: Overall project cost assumptions | |
|---|---|
| **Cost** | **PHP million (2015 prices)** |
| Capex (total) | 8,562 |
| Routine Maintenance, per km/year | 0.75 |
| Periodic Maintenance, per km / every 5 years | 13.1 |
| Operation Cost, per km/year | 3.6 |

*Source: Outline Business Case and Mott MacDonald analysis*

## 2.4 Intended and Proposed Structure

Based on the available information, the proposed structure which can be considered for this project is the Build-Transfer-Operate (BTO) concession arrangement, in which the private sector takes the traffic/revenue risk.

In more detail, the implementing agency (DPWH) will contract the private sector to finance, design, construct and operate and maintain CLLEX Phase 2. The ownership of the expressway is transferred to the DPWH once the CLLEX Phase 2 is commissioned.

It is expected that construction of CLLEX Phase 1 is completed before CLLEX Phase 2 is completed. The private sector can start operation of the CLLEX Phase 1 toll road on behalf of the DPWH under a concession agreement, and recover its investment for CLLEX Phase 2 early through charging and collecting toll revenues from the road users on CLLEX Phase 1. Once CLLEX Phase 2 is commissioned, the private sector will operate CLLEX Phases 1 and 2 as a whole.

In case there is insufficient forecast demand to make CLLEX project financially viable, viability gap funding could be provided up to a maximum of 50% of project cost.

Assessment for the suitability of the proposed structure is as follows:

- Since the launch of President Aquino's PPP Program, a number of PPP transport infrastructure projects (including three toll roads projects) have successfully reached financial close using a Build -Transfer- Operate (BTO) concession arrangement.
- Precedence indicates sufficient financial capacity within the local markets to finance and take risks for projects similar to those seen in this project. These risks include the private sector building the infrastructure assets on a turn-key basis, taking on cost and time overruns and specified performance risks.

- The government prefers to secure the legal ownership of the asset at an early stage.
- There has been strong demand for road infrastructure, and therefore public and private stakeholders do not appear to consider the issue of insufficient traffic demand as a major risk. The government's preference (with which local private investors generally agree) is that the demand risk should be allocated to private sector. Thus, shadow tolling or availability payment mechanisms have not been favoured by the government in the road sector.
- Currently, there is no clarity in Department of Finance on the budget and regulations for output or performance based payment structure contracts, therefore concessions PPP are preferred to availability based PPPs.

Therefore, the proposed model is a 25-30 years (excluding construction) BTO concession model for the CLLEX Phase 1 with O&M contract packaged together for CLLEX Phases 1 and 2.

The project could be potentially attractive to the private sector, given that at the time of procurement of the second stage, the first phase will be generating a cash flow through tolls. The private sector will have more confidence on traffic forecasts for the entire project, having real evidence of demand.

On the other hand, risks to the project include the quality of the design and construction of the first phase, as well as a potential adverse impact of traffic when the proposed North Luzon Expressway is built.

## 2.5 Any Technical Issues

The technical consultant assesses that there are no exceptional technical issues currently encountered that a competent and experienced designer, contractor and operator will not be able to manage and overcome.

## 2.6 Other Relevant Issues

More robust revenue and cost estimates are needed to increase the reliability of assessments.

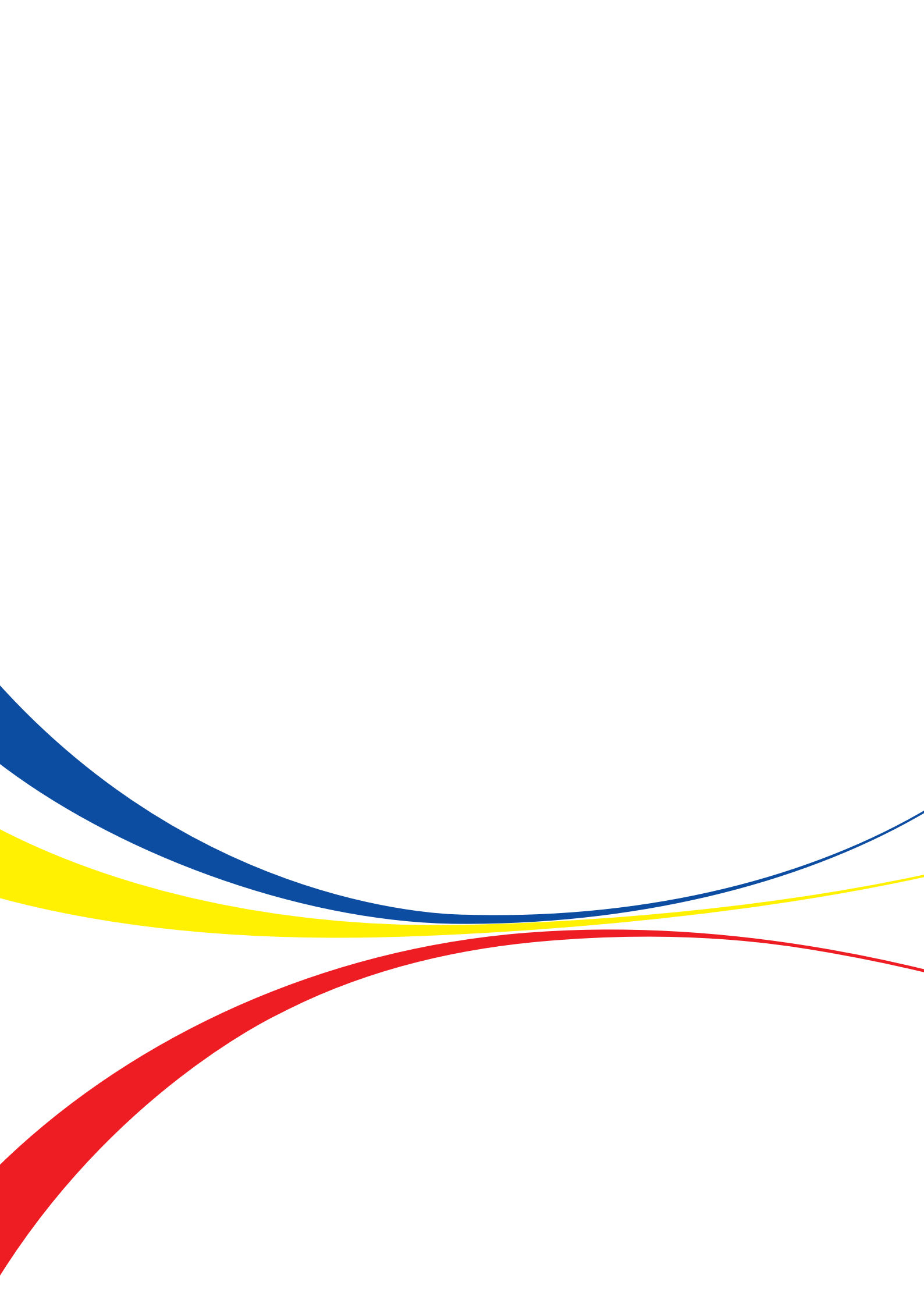
## 2.7 Further Action Needed

The following table summarizes the issues that need to be addressed for the project to progress as a PPP:

| Table 2.5: List of actions to take for PPP | | |
|---|---|---|
| **Potential Issue** | **Responsibility and recommended action** | **Timeframe** |
| Completion of Feasibility Study and submission to NEDA / ICC | DPWH | Before the bid phase |
| Internal assessment:<br>• Value for money<br>• Financial bankability<br>• Environmental<br>• Social & Economic | PPP Center<br>DOF<br>DENR<br>NEDA | Before the bid phase |
| Final approval by ICC-Cabinet Committee and NEDA Board | ICC / NEDA | Before the bid phase |
| ROW acquisition | DPWH | Within 2 years / before construction |
| Tender process | DPWH with assistance of PPP Center / international transaction advisor | |

*Source: Mott MacDonald's analysis*

# 3. KANCHANABURY – PHU NAM RON MOTORWAY PROJECT (THAILAND)



# 3. KANCHANABURY – PHU NAM RON MOTORWAY PROJECT (THAILAND)

## Project Summary

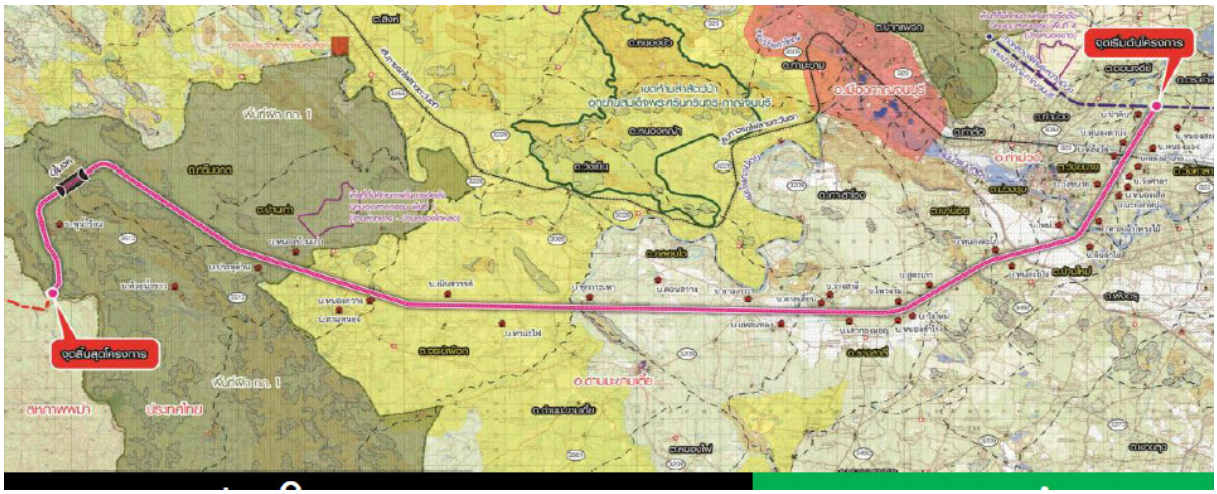



*Figure 1: Project Location in Kanchanaburi, Thailand*

| **Project Details** | | |
|---|---|---|
| **Project Cost** | **Duration** | **Project Implementing Agency** |
| *DOH estimates (2015 prices):*<br><br>CAPEX: THB 46,747 million<br>OPEX: THB 23,807million | 30 years after open to the traffic (plus 3 years construction) | Department of Highways (DOH), Thailand |
| **Summary of Project** | | |
| Construction and Operations & Maintenance of 82km motorway | | |
| Intended Procurement Method | • The Thai government is considering either a Build-Transfer-Operate (BTO) model where the private sector takes traffic/revenue risk, or a Design-Build-Finance-Maintain-Operate (DBFMO) model where the public sector takes traffic/revenue risk. | |
| **Project Background** | | |
| Relevance to country and ASEAN connectivity | • This motorway link is to connect between the Kanchanaburi and Dawei Port in Myanmar, under the Greater Mekong Subregion (GMS) Economic Corridor Master Plan. | |
| Scope of Overall Project | • Connects the Motorways route No. 81 Ban Phu Nam Ron, Thai-Myanmar border. | |

| Project Details (cont.) | |
|---|---|
| **Project Background** | |
| Proposed Structure | • While the Department of Highways has been considering a BTO structure where the private sector takes demand risk, the analysis built on the traffic projections indicate that the project may not be attractive to the private sector if it is to take full traffic risk. The analysis hence proposes that the government provides availability payments in a DBFMO model (with availability payments) to enhance the attractiveness of the project. |
| Further considerations | • The overall cost of the project to the government by providing availability payments will need to be compared to the cost of procuring the project on a public basis to determine whether a PPP project will bring value for money. |

## Full Project Report

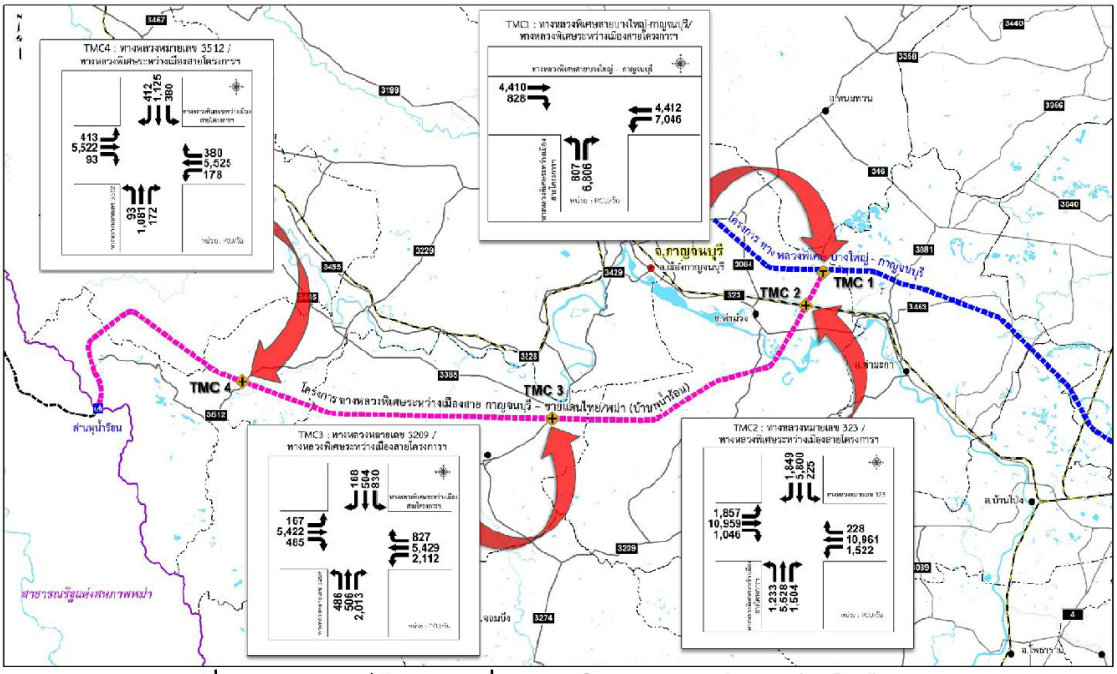



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*Figure 2: Route plan showing junctions and traffic volume – Year 2021*

### 3.1 Project Scope

The motorway starts at Ban NongSeu in Kanchanaburi Province. It will connect to a new Bang Yai – Kanchanaburi Motorway (to be implemented by DOH with public financing). The Project ends at Ban Phu Nam Ron in Kanchanaburi Province. The proposed motorway will have three major junctions linking to highway number 323, 3209 and 3512.

The following table summarises some key technical parameters of the project.

| Table 3.1: Project Technical characteristics | |
|---|---|
| **Parameter** | **Value** |
| Length | 78 km |
| Lane set up | 2 x 2 lanes |
| Road Width/ Lane | 3.5m |
| Outer Shoulder | Typical 2.5m |
| Inner Shoulder | Varies, typical 1.5-2.5m |
| Design Speed | 90km/h |
| Number Bridges | unknown |
| Interchanges | 4 |
| Construction Duration | 3 years |
| Project Duration | 30 years |

## 3.2 Traffic Projections and Preliminary Assessment

Only the results from the traffic analysis report were available for review. A review of the methodology used for the traffic analysis, the assumptions and the process used needs to be carried out in order to assess the robustness and reliability of the project. The table below summarises traffic and revenue forecast as prepared by the DOH.

| Table 3.2: DOH Traffic and Revenue Forecast | | | | | |
|---|---|---|---|---|---|
| **Year** | **Traffic Volume (pcu/ day)** | **Fixed price at year 2014** | | **Toll increases at 12.5% every 5 years** | |
| | | **THB m /day** | **THB m /year** | **THB m /day** | **THB m /year** |
| 2021 | 26,741 | 1.22 | 409.85 | 1.22 | 409.85 |
| 2022 | 28,098 | 1.29 | 430.59 | 1.29 | 430.59 |
| 2023 | 29,523 | 1.35 | 452.38 | 1.35 | 452.38 |
| 2024 | 31,021 | 1.42 | 475.26 | 1.42 | 475.26 |
| 2025 | 32,594 | 1.49 | 499.31 | 1.49 | 499.31 |
| 2026 | 34,248 | 1.57 | 524.57 | 1.76 | 590.14 |
| 2027 | 35,985 | 1.65 | 551.11 | 1.85 | 620.00 |
| 2028 | 37,811 | 1.73 | 578.99 | 1.94 | 651.37 |
| 2029 | 39,729 | 1.82 | 608.28 | 2.04 | 684.32 |
| 2030 | 41,051 | 1.88 | 628.45 | 2.11 | 707.01 |
| 2031 | 42,417 | 1.94 | 649.29 | 2.45 | 821.75 |
| 2032 | 43,828 | 2.00 | 670.81 | 2.53 | 849.00 |
| 2033 | 45,287 | 2.07 | 693.05 | 2.62 | 877.14 |
| 2034 | 46,793 | 2.14 | 716.03 | 2.71 | 906.22 |

| Table 3.2: DOH Traffic and Revenue Forecast (cont.) | | | | | |
|---|---|---|---|---|---|
| **Year** | **Traffic Volume (pcu/day)** | **Fixed price at year 2014** | | **Toll increases at 12.5% every 5 years** | |
| | | **THB m /day** | **THB m /year** | **THB m /day** | **THB m /year** |
| 2035 | 48,350 | 2.21 | 739.77 | 2.79 | 936.27 |
| 2036 | 49,959 | 2.28 | 764.29 | 3.25 | 1,088.22 |
| 2037 | 51,622 | 2.36 | 789.63 | 3.36 | 1,124.30 |
| 2038 | 53,339 | 2.44 | 815.81 | 3.47 | 1,161.57 |
| 2039 | 55,114 | 2.52 | 842.85 | 3.58 | 1,200.08 |
| 2040 | 56,717 | 2.57 | 859.99 | 3.66 | 1,224.48 |
| 2041 | 58,367 | 2.62 | 877.48 | 4.20 | 1,405.56 |
| 2042 | 60,065 | 2.67 | 895.33 | 4.28 | 1,434.14 |
| 2043 | 61,812 | 2.73 | 913.53 | 4.37 | 1,463.30 |
| 2044 | 63,611 | 2.78 | 932.11 | 4.46 | 1,493.06 |
| 2045 | 65,461 | 2.84 | 951.06 | 4.55 | 1,523.42 |
| 2046 | 67,365 | 2.90 | 970.40 | 5.22 | 1,748.70 |
| 2047 | 69,325 | 2.96 | 990.14 | 5.33 | 1,784.26 |
| 2048 | 71,342 | 3.02 | 1,010.27 | 5.43 | 1,820.55 |
| 2049 | 73,417 | 3.08 | 1,030.82 | 5.54 | 1,857.57 |
| 2050 | 75,553 | 3.14 | 1,051.78 | 5.66 | 1,895.34 |
| **Total** | | | **22,323.24** | | **32,135.14** |

Based on the forecast traffic volumes above, the traffic is projected to grow at 5% per year over the first 10 years of motorway operation, and at 3% per year after that. This is consistent with the statistics from DOH developed from historic traffic counts, reporting that growth of traffic in Thailand between 2001 and 2011 averaged 3% to 5% per annum (heavy goods vehicle or HGV growth around 5%). As an example, in 2011 two lane highways in Thailand attracted between 14m and 30m vehicles.

The following figure illustrates the traffic situation ‘without project’ and ‘with project’. The project appears to relieve the local roads and to attract more traffic in the transit corridor from Bangkok. The demand for the project appears strong with a minimum of 13,800 passenger car units in a least trafficked part.

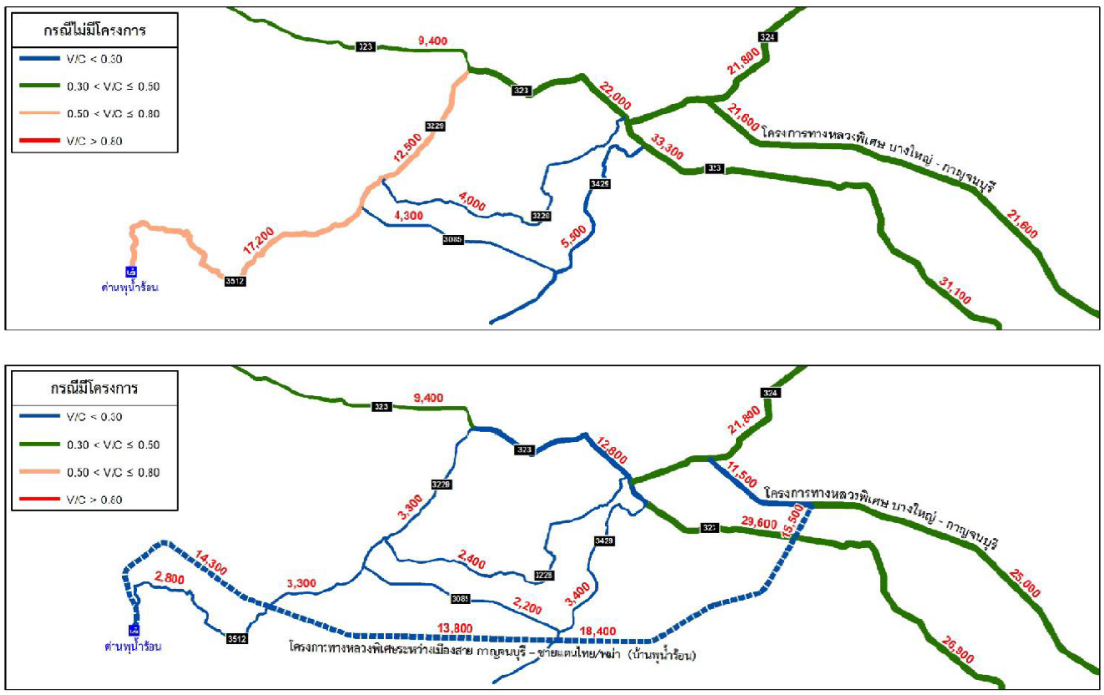



*Figure 3: DOH Traffic Projections for Year 2021*
*Source: DOH*

Traffic counts have been carried out in Thailand since 1962. Bureau of Highways Safety uses advanced detection technology, such as permanent and automatic stations to gather traffic information. In 2011, sixty microwave radars and CCTV together with manual counts have been used to collect traffic data. As such, enough information and data should be available to construct a robust traffic forecast.

It is worth noting that as the project is on the border with Myanmar, there is a political and economic risk associated with Myanmar, including any change in trade policies between Myanmar and Thailand. In addition, the capacity of the border crossing and the connecting highway in Myanmar will need to be consistent with the volume of Kanchanabury – Phu Nam Ron motorway traffic and this risk is outside the control of the concession company or the Thai government.

Sponsors and lenders will need to do their own due diligence to assess these traffic estimates.

## 3.3 Costs and Preliminary Assessment

DOH's Project cost estimation is summarised in the two tables below. There is no information about the content of the CAPEX. The breakdown is at a very high level and which accuracy of the proportions and per item calculations cannot be verified.

| Table 3.3: DOH Estimated Project CAPEX (THB million) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | **Survey and Design** | **Land Ownership Survey** | **Land Acquisition** | **Construction Supervision** | **Civil** | **M&E** | **Environmental** | **Total** |
| 2014 | 30 | | | | | | | 30.00 |
| 2015 | 50 | | | | | | | 50.00 |
| 2016 | | 15 | | | | | | 15.00 |
| 2017 | | 15 | | | | | 0.40 | 15.40 |
| 2018 | | | 770 | 170 | 15,000 | | 2.20 | 15,942.20 |
| 2019 | | | 770 | 170 | 15,000 | 700 | 2.70 | 16,642.70 |
| 2020 | | | | 200 | 14,700 | 800 | 1.70 | 15,701.70 |
| **Total** | **80*** | **30*** | **1,540*** | **540** | **44,700** | **1,500** | **7.00** | **48,397.00**** |

* The cost of survey, land ownership survey and land acquisition will be borne by DOH.
** Estimated CAPEX to the Joint Venture, to be set up by both the public and private sector = THB 46,747 million.

Design as a proportion of the Civil Works (0.18%) is considered to be on the very low side.

Overall as a rough benchmark, the overall CAPEX value of around USD 1.3 billion or USD 16.7 million per kilometre is considered to be on the high side. The project costs are considerably higher compared to both national and regional comparators.

The following OPEX has been estimated by DOH.

| Table 3.4: DOH Estimated Project OPEX (THB million) | | | | | | |
|---|---|---|---|---|---|---|
| **Year** | **Maintenance Cost** | | | **Operation cost** | **Environmental Cost** | **Total** |
| | **Normal** | **Seal Coat** | **Overlay** | | | |
| 2021 | 101 | 0 | 0 | 317 | 2 | 420 |
| 2022 | 104 | 0 | 0 | 325 | 2 | 431 |
| 2023 | 106 | 125 | 0 | 333 | 0 | 564 |
| 2024 | 109 | 0 | 0 | 342 | 0 | 451 |
| 2025 | 112 | 0 | 0 | 350 | 2 | 464 |
| 2026 | 114 | 0 | 901 | 359 | 0 | 1,374 |
| 2027 | 117 | 0 | 0 | 368 | 0 | 485 |
| 2028 | 120 | 0 | 0 | 377 | 0 | 497 |
| 2029 | 123 | 145 | 0 | 387 | 0 | 655 |
| 2030 | 126 | 0 | 0 | 396 | 2 | 525 |
| 2031 | 129 | 0 | 0 | 406 | 0 | 536 |
| 2032 | 133 | 0 | 1,045 | 416 | 0 | 1,594 |
| 2033 | 136 | 0 | 0 | 427 | 0 | 563 |

| Table 3.4: DOH Estimated Project OPEX (THB million) (cont.) | | | | | | |
|---|---|---|---|---|---|---|
| Year | Maintenance Cost | | | Operation cost | Environmental Cost | Total |
| | Normal | Seal Coat | Overlay | | | |
| 2034 | 139 | 0 | 0 | 438 | 0 | 577 |
| 2035 | 143 | 168 | 0 | 448 | 3 | 762 |
| 2036 | 146 | 0 | 0 | 460 | 0 | 606 |
| 2037 | 150 | 0 | 0 | 471 | 0 | 621 |
| 2038 | 154 | 0 | 1,212 | 483 | 0 | 1,849 |
| 2039 | 158 | 0 | 0 | 495 | 0 | 653 |
| 2040 | 162 | 0 | 0 | 507 | 3 | 672 |
| 2041 | 166 | 195 | 0 | 520 | 0 | 880 |
| 2042 | 170 | 0 | 0 | 533 | 0 | 703 |
| 2043 | 174 | 0 | 0 | 546 | 0 | 720 |
| 2044 | 178 | 0 | 1,405 | 560 | 0 | 2,144 |
| 2045 | 183 | 0 | 0 | 574 | 3 | 760 |
| 2046 | 187 | 0 | 0 | 588 | 0 | 776 |
| 2047 | 192 | 226 | 0 | 603 | 0 | 1,021 |
| 2048 | 197 | 0 | 0 | 618 | 0 | 815 |
| 2049 | 202 | 0 | 0 | 634 | 0 | 835 |
| 2050 | 207 | 0 | 0 | 649 | 0 | 856 |
| **TOTAL** | **4,436** | **858** | **4,563** | **13,934** | **16** | **23,808** |

Routine maintenance costs appear to assume a yearly inflation between 1.9% and 3.0%. Operational costs appear to assume a yearly inflation between 2.3% and 2.7%. The lifecycle maintenance costs appear to be reasonably spread with alternating minor and major rehabilitation every six years or one intervention every three years.

Overall, as a rough benchmark, the value of operation (in 2021) of around USD 9.5 million to be on the high side compared to both national and regional comparators.

| Table 3.5: OPEX Cost Assumptions | | |
|---|---|---|
| **OPEX** | **THB million/ km** | **USD thousand/ km** |
| Routine maintenance cost per kilometre in 2021 | 1.3 | 40 |
| Minor lifecycle maintenance cost every 6 years in 2023 | 1.6 | 50 |
| Major lifecycle maintenance cost every 6 years in 2026 | 11.5 | 350 |

*Source: DOH, Mott MacDonald analysis*

Sponsors and lenders will need to do their own due diligence to assess these cost estimates.

## 3.4 Intended and Proposed Structure

For the Kanchanaburi – Ban Phu Nam Ron Motorway project the Department of Highways considered (besides the direct procurement) two PPP options: BTO and DBFMO.

**Table 3.6: Proposed structure of the project**

| Category | BTO | DBFMO |
|---|---|---|
| Contracting parties | Government on the one side and a Joint Venture consisting of a private investor and the Government on the other. | Government on the one side and a private investor on the other. |
| Content | Design, construction, finance, operation and maintenance of the project. | Design, construction, finance, operation and maintenance of the project. |
| Cost | Construction costs are funded by the JV. Government might partially subsidise the construction costs. | Construction costs are wholly funded by the private investor. |
| Revenue | Tolls collected and retained by the JV. | Tolls collected and transferred to the government.<br>Government makes monthly availability payment to investor (with performance adjustment) |
| Demand risk | Demand risk rests with the JV | Demand risk rests with the government |
| Asset ownership | The ownership of the asset is transferred to the government at the end of construction. | The ownership of the asset is transferred to the government at the end of the project. |
| Return On Investment (ROI) | The ROI is determined by the DOH. For this type of project the typical is around 10%. | The ROI is determined by the DOH. For this type of project the typical is around 7%. |
| Existing project examples | Two examples of projects delivered through BTO that have already been implemented in Thailand are Sri Rat Expressway and Don Muang Tollway. | One example that has been exercised in Thailand is the MRTA Purple Line Bang Yai – Bang Sue where BMCL is the operator. |

*Source: DOH*

A thorough price build–up and risk analysis may be considered to understand the real cost of the project, to be tested in a competitive bidding situation.

Both the BTO and Availability Payment options seem to be acceptable in the Thai context. The BTO option appears to be more favoured by the public sector (demand risk transferred to private). The robustness of the demand is the key factor to make this decision.

However, the BTO option as envisaged by DOH (where the PPP company bears the traffic risk and is paid by toll revenues) may not be commercially attractive to the private sector, as it is likely that the project's revenues from traffic are insufficient to cover total costs of the project.

To make the project bankable, the government may consider the use of Availability Payments/ shadow toll/capital subsidy structures. The project could be structured on a DBFMO (availability payment) basis, with toll road revenues being paid directly to the government and the government making monthly availability payments to the private sector.

The key features of the model are:

- The implementing agency (DOH) will contract the private sector to design, finance, construct and operate and maintain the toll road for a specified period.
- Once the motorway is commissioned the private sector will operate it on behalf of DOH in accordance with predefined KPIs.
- Government will take the traffic risk. Private sector will collect toll revenues on behalf of DOH and will pass the revenues to the government. The private sector will be remunerated not by the toll revenues but by the government regular availability payments linked to company's performance in accordance to contractually defined KPIs. These availability payments will have to cover private company's cost for road operating and maintenance, cost of financing the road construction, profit margin and other associated cost.
- Government would be responsible for the land acquisition and will bear resettlement cost.
- The duration of PPP contract during road operational phase is 30 years.

## 3.5 Any Technical Issues

The technical consultant assesses that no exceptional technical issues are currently encountered that a competent and experienced designer, contractor and operator will not be able to manage and overcome.

## 3.6 Other Relevant Issues

More robust revenue and cost estimates are needed to increase the reliability of assessments.

## 3.7 Further Actions Needed

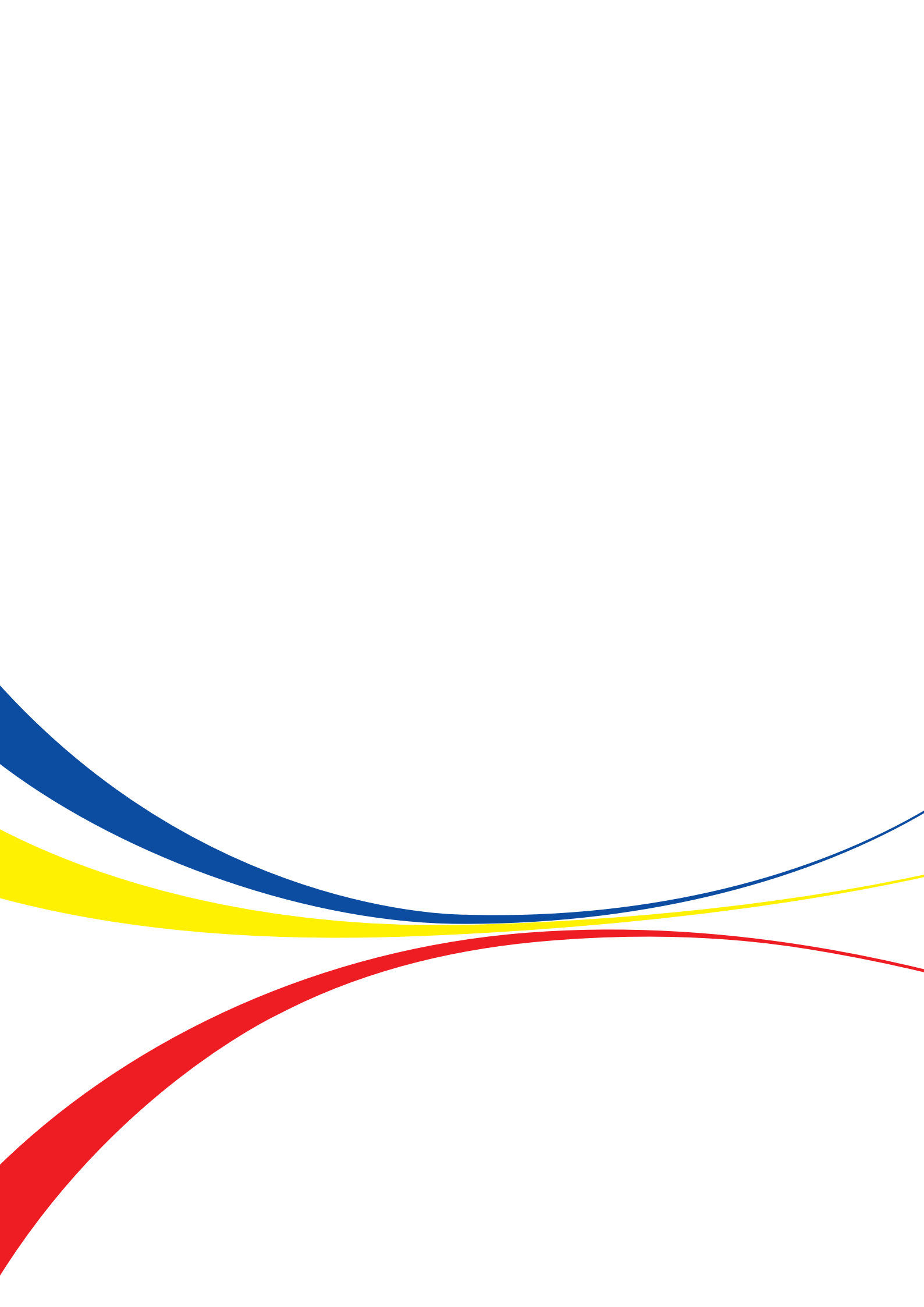
The following table lists the actions that need to be taken for the project to progress as a PPP:

**Table 3.7: List of actions to take for PPP**

| Potential Issue | Responsibility and recommended action | Timeframe |
|---|---|---|
| Robust traffic study to get confidence in the demand forecast | DOH and Investor | Before contract signature |
| Engineering feasibility study to further develop outline design and more robust costs estimates | DOH | Before procurement stage |
| Environmental Impact Assessment, including:<br>• Initial Environmental Examination<br>• Environmental Impact Examination<br>• Preparation of additional measures<br>• Classification of environmental impact mitigation measures<br>• Inclusion of measures into engineering design<br>• Formulation of environmental impact prevention measures and requirements | DOH | At the appropriate stage |
| Robust cost estimates | DOH | Before procurement stage |
| ROW acquisition | DOH | Before construction stage. Typically 2 to 3 years. |
| Tender Process | DOH | |

*Source: Mott MacDonald's analysis*

# 4. LAOS ROAD NO. 3 (BOTEN – NATUEY – HOUAYXAY): ASEAN HIGHWAY NO. 3



# 4. LAOS ROAD NO. 3 (BOTEN – NATUEY – HOUAYXAY): ASEAN HIGHWAY NO. 3

## Project Summary


*Figure 1: Project Location Bokeo and Luang Nam Tha Provinces, Northern Laos*

| **Project Details** | | |
|---|---|---|
| **Project Cost** | **Duration** | **Project Implementing Agency** |
| *Derived from benchmark prices (2015 prices):*<br>Annual routine maintenance cost : : USD 860,000/yr<br>Periodic 10-year maintenance costs: US$ 85 million/10yrs | 25-30 years<br>(recommended) | Ministry of Public Works and Transport (MPWT) |
| **Summary of Project** | | |
| Project involves operation and maintenance, and potentially upgrading of existing 225km road, running from Houayxay district in Bokeo province at the Lao-Thai border to the Boten area in Luang Namtha province at the Lao-Chinese border[3]. | | |
| Intended Procurement Method | • It is understood that the road was upgraded in 2014 funded by ADB, Chinese and Thai governments. It is now Class III ASEAN standard, and we understand that currently no major rehabilitation work is required.<br>• However due to large proportion of transit trucks, the Lao PDR government wishes to impose tolls for foreign trucks, to be subsequently used to cover adequate road maintenance and operation cost.<br>• The government intends to use a PPP model for the Operations and Maintenance of the road. | |

[3] As of 4 March 2016, the Government of Lao PDR updated the WB that there was a plan for a new Greenfield Road 3 Expressway to cater to the projected increase in traffic resulting from trade and tourism in the area as part of its long-term development plan, in addition to this current brownfield project. The MPWT will be selecting a firm to conduct the feasibility study for this new proposed Greenfield project.

| Project Details (cont.) | |
|---|---|
| **Project Background** | |
| Relevance to country and ASEAN connectivity | • The road is a part of Asian Highway No 3 and GMS East-West Economic Corridor. It mainly serves as regional transit route providing a vital link in facilitating trade between China and Thailand. Therefore, the majority of the traffic constitutes Chinese and Thai heavy trucks.<br>• It is understood that the road condition is deteriorating and that currently the road maintenance cost is paid from Lao government budget while most of the benefits go to the countries where the transit trucks originate (China and Thailand). |
| Scope of Toll Road | Operations and maintenance, and potentially upgrading of existing 225km road, running from Huayxay district in Bokeo province at the Lao-Thai border to the Boten area in Luang Namtha province at the Lao-Chinese border. |
| Proposed Structure | • PPP for Operations & Maintenance, with the public sector taking traffic/ revenue risk and providing availability payments.<br>• Possibility of considering guarantees from institutions such as MIGA, to enhance the attractiveness of the project to the private sector. |
| Further considerations | • Since this road is currently not tolled, a strong policy priority is to ensure continued access to the route for Laotian citizens. Hence, there may be a requirement to ensure that such no or low-cost access continues.<br>• A potentially important issue affecting projected traffic on the road, as well as overall revenues to the Lao government, would be the imposition of the transit fee on foreign trucks. This is still under discussion between the Thai, Chinese and Lao governments.<br>• Studies on the road will have to be considerably enhanced to enable a more accurate assessment of the project. |

# Full Project Report

## 4.1 Project Scope

Based on the information from MPWT Department of Planning and Investment (MPI), Road 13 was upgraded in 2014 with funding assistance from ADB and the Governments of Thailand and China. Whilst there is no formal description of the project available, the technical characteristics information on the road that were available for review are presented below.

**Table 4.1: Project Technical Characteristics**

| Parameter | Value |
|---|---|
| Length | 225 km |
| Lane set up | 2 lanes |
| Road width | 7 m |
| Median | none |
| Design Speed | 40-60 km/h |
| Structure loading | 11 tonnes per axle |
| Major intersections | 4 major intersections with other national roads |

The road appears to meet ASEAN Highway Standard, albeit the lowest standard i.e. Class III[4]. The 2010 Master Plan for ASEAN Connectivity envisages that by 2020 all designated routes are to be upgraded to at least Class I standards, which would entail widening the road to 4 lanes. However, for low traffic volume non-arterial routes, Class II standards would be acceptable. Within MPWT there are mixed views on widening the road to 4 lanes. Additional capacity would need to be considered thoroughly given the currently low level of traffic. Considerations for full widening to 4 lanes would need the traffic to justify the large additional investment costs required.

*Sources: Ministry of Public Works & Transport, Google Maps*

## 4.2 Traffic Projections and Preliminary Assessment

No recent traffic studies were made available for review. Based on information given by MPWT, current levels of traffic on AH3: Boten-Nateuy-Houayxay (Laos Road No. 3) are less than 8,000-10,000 vehicles per day, of which 60-70% consists of foreign trucks.

According to the data from Lao Statistics Bureau, the annual average growth of freight carried by land was 17% over 2000-2012. MPWT has an optimistic view about the future transit traffic growth. During discussions, MPWT stated that in 2014 the number of vehicles crossing at Lao – Chinese border was 260,000, which almost doubled since 2012-2013 level of 150,000. While the growth rate is impressive, it is not clear how these figures are aligned with daily traffic

[4] See ASEAN Strategic Transport Masterplan 2011, p. 3-14 for the highway standards characteristics.

on Road No. 3 given above. It is recommended that a full traffic study be conducted to obtain reliable data if the project is to be progressed further.

As stated before, commercial viability of the project will ultimately depend on the Lao government's commitment to charge transit fees to Thai and Chinese trucks, and the level of tolls to be charged. Currently, MPWT considers a transit fee of USD 40 per truck, to be paid at the border as an open toll. This appears rather high and it is not understood how this figure was derived. Assuming a case of 8,000 vehicles and 60% of trucks, this would give average revenue of about USD 200,000 per day, which is very high when compared to the indicative annual cost of routine maintenance of USD 810,000. The project economics may require further assessment to determine level of acceptable transit fee.

The toll tariff will depend on the road users' willingness to pay, which for transit trucks may be potentially high as there are limited alternative routes between China and Thailand. The main alternative would be to go via Myanmar, which appears a lot lengthier than Road No. 3.

## 4.3 Costs and Preliminary Assessment

Indicative figures have been obtained from the study developed by the World Bank PPIAF on highway PPPs in Laos. The table below provides values of previous performance based contracts over the period 2008-2011 for routine maintenance of national roads, in particular some sections of Road No. 3, as well as Road No. 17, which is located to the north of Road No. 3 in the same province and runs through similar topography and is considered of comparable technical characteristics (2 lane, double bituminous surface treatment or DBST). The cost of US$ 3,000 to US$ 3,600 per km seems to be in the right order of magnitude for routine maintenance of DBST road when compared to neighbouring countries, such as Thailand.

**Table 4.2: Routine Maintenance Costs for National Roads of Comparable Characteristics**

| Road No. | Kip (total value of 3 year contract) | Road section length (km) | Kip per year | Kip per km | Kip per km (2015 prices) | USD per km (2015 prices) |
|---|---|---|---|---|---|---|
| 3/3A | 5,469,290,000 | 85 | 1,823,096,667 | 21,448,196 | 29,237,353 | 3,566 |
| 17A | 3,767,708,758 | 70 | 1,255,902,919 | 17,941,470 | 24,457,120 | 2,983 |
| 17B | 4,406,400,000 | 72 | 1,468,800,000 | 20,400,000 | 27,808,493 | 3,391 |
| 3 | 4,638,276,360 | 72 | 1,546,092,120 | 21,473,502 | 29,271,849 | 3,570 |

*Source: MPWT, Mott MacDonald analysis*

Assuming routine maintenance cost of US$ 3,600 per km, indicative annual routine maintenance cost for the full route AH3: Boten-Nateuy-Houayxay could be of the order of US$ 810,000. Emergency maintenance cost would also have to be included in the operation cost strategy.

In the same PPIAF study cost of periodic maintenance assuming 10 year interval have been estimated to be around 3 billion Kip per km (US$ 375,000) for DBST road.

Taking this figure as a benchmark, the periodic one-time maintenance for route AH3: Boten-Nateuy-Houayxay would cost around US$ 84 million. Since the road was rehabilitated recently, capital maintenance is unlikely to be required at the first years of operation, and therefore it would allow private sector to accumulate some revenues prior to any heavy maintenance. As a rough estimate, assuming a 30-year contract and that heavy maintenance is required three times, the annual cost would be USD 8.5 million.

In the PPIAF study, annual operating costs of a toll booth have been estimated within the range of US$ 5,000 to US$ 21,000, based on the statistics of toll booth operating costs on the two current toll bridges in Laos.

It is recommended that a business case for Road 13 be developed, which would include a comprehensive road asset inventory, condition assessment to identify type of rehabilitation and maintenance required, and robust Capex and Opex estimates.

## 4.4 Intended and Proposed Structure

There appear is to be a number of reasons why Lao government is seeking a PPP model for AH3: Boten-Nateuy-Houayxay [Laos Road No. 3] including:

- **Lack of budget funds.** The National Road Maintenance Fund seems to be insufficient relative to Laos' needs (for example, in 2010 it was reported to cover only 40% of annual maintenance needs). It is reported that only two national roads (AH3 [Laos Road No. 3] and AH16 [Laos Road No. 9]) meet the ASEAN highway standard, while the other six will have to be upgraded, placing significant demand on this budget[5].

- **Transit nature of the route.** The majority of traffic is reported to be transit (around 70%), comprising mainly Thai and Chinese heavy trucks, which contribute to significant deterioration of the road asset. While foreign trucks enjoy the benefits of using the road, the road maintenance cost is incurred by Lao government, which can be quite significant as in addition to standard maintenance it also includes providing traffic police, ambulance services, taking care of numerous road accidents. Therefore, the Lao government wishes to impose some kind of transit fees for foreign trucks, which would be subsequently used to provide adequate road maintenance and operation. As this route represents a shortcut between China and Thailand with no plausible alternatives, doing so may both be acceptable to the transit trucks while at the same time beneficial to Laos.

- **Safety and operational efficiency.** As the road runs through mountainous terrain, there are multiple road bends and the driving conditions are risky, and therefore inability to meet a safety standards is a permanent issue. Currently, road accidents frequency is reported by MPWT to be once or twice a week, which again places a burden on Lao government budget.

[5] http://www.nationmultimedia.com/aec/Laos-faces-daunting-challenge-in-road-network-upgr-30253468.html

A long-term contract for operations and maintenance of the existing road, with availability payments, may be the most appropriate PPP model at this stage. Department of Transport of MPWT as a government contracting agency would procure the private firmto operate and maintain the existing road in accordance with predefined KPIs. Examples of such KPIs are:

- Absence of potholes and the control of cracks and rutting, which effects safety and pavement performance
- Minimum allowable amount of friction between tires and the road surface for safety reasons
- Maximum allowable amount of siltation or other obstruction of the drainage system to avoid destruction of the road structure
- Retro reflexivity of road signs and markings for safety purposes

Albeit limited, some upfront capital expenses will potentially be required to procure toll infrastructure, undertake preventive maintenance, install safety features, road signs etc. For this prior investment, the private company will possibly take a loan.

The private company would receive regular availability payments from the MPWT subjected to its performance, in accordance with contractually defined KPIs. In case the company fails to achieve some of the KPIs, there would be a penalty.

At this stage without having reliable information on the traffic level, the traffic/revenue risk may be considered to be retained with government for the following reasons:

- **Encouraging private sector participation.** It is understood that PPP market is in infancy in Laos, and passing too much risk to private investor might reduce interest in the project. Possibly, investor would require minimum traffic guarantees anyway.

- **Flexibility of government expenditure.** The collected transit fees could go to a Road Maintenance Fund, which can not only serve payments for this project but be distributed according to the MPWT's other roads' needs.

However, this could be the subject of future review, should traffic forecasting studies indicate strong, reliable demand, such that private sector had appetite for this risk.

The potential source of government availability payments to the private sector would come from collected transit fees. Lao government's commitment to impose transit charges on Thailand and China is believed to be crucial for project viability.

It should be noted that long-term availability based payment contract structure creates long-term liabilities to the government, whose budget has generally short-term horizon. Although private sector operation and maintenance cost should be covered by toll revenues, sovereign guarantees on availability payment will potentially be required by the private sector. These could be provided for example by MIGA.

It is understood that Government financial support is generally not provided in Laos; however provision of sovereign guarantees on certain aspects (availability payment, foreign exchange risks, other public defaults, etc) may be necessary to close a PPP project successfully. The sovereign guarantees could be provided with assistance from IFIs.

The contract duration is recommended to be long term, say 25-30 years, in order to incentivise the private sector to provide more efficient service and reduce life-cycle cost.

## 4.5 Any Technical Issues

The technical consultant assesses that as a brownfield project, there are no apparent technical issues that a competent and experienced road operator would not be capable to manage. However, road asset inventory and condition assessment is required to identify the exact scope of the rehabilitation and maintenance.

## 4.6 Other Relevant Issues

Tolls will be charged for transit traffic as well as local long distance traffic. Based on the information provided by MPWT, local traffic represents a small portion of the traffic, therefore it is not likely to be a disruption for transit traffic. Should the traffic levels increase in the future, frontage roads can be provided at some sections of the road passing through populated urbanised area. In this way local short distance traffic would go on the road free of charge and would not interfere with trucks on the main lines.

## 4.7 Further Actions Needed

The following table lists the actions that need to be taken for the project to progress as a PPP:

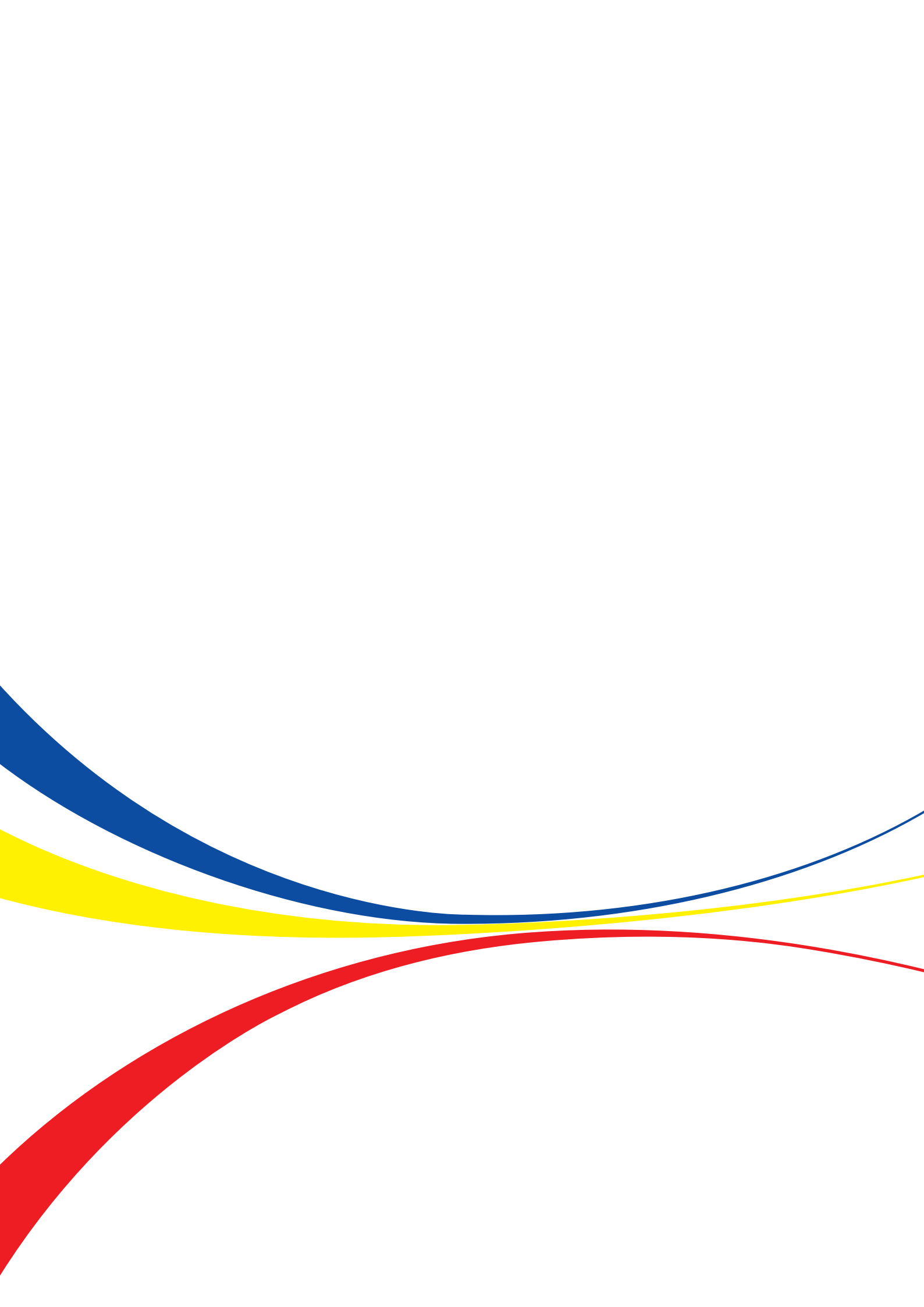
**Table 4.3: List of actions to take for PPP**

| Potential Issue | Responsibility and recommended action | Timeframe |
|---|---|---|
| Mechanism of charging transit fees and the level of such fees needs to be established. | Government of Laos in coordination with government of neighbouring countries / Consider recommendations of ADB study once it is finalised. | Before the bid stage |
| Traffic study needs to be completed to achieve bankable level of detail. | MPWT | Before the bid stage |
| Scope of the project generally needs to be clarified within the public sector, and the scope of the contract with the private sector needs to be clearly established. | MPWT, with potential assistance from IFIs for tender preparation | Before the bid stage |

| Table 4.3: List of actions to take for PPP (cont.) | | |
|---|---|---|
| **Potential Issue** | **Responsibility and recommended action** | **Timeframe** |
| Private investor will potentially require provision of sovereign guarantees, for example on availability payment. | MPWT should seek assistance of IFIs, for example MIGA to provide such guarantees. | Before the bid stage |
| Road inventory and condition assessment and necessary technical studies (for example geotechnical and topographical investigations) have to be conducted to identify what rehabilitation and maintenance is likely to be required, and to prepare preliminary cost estimates. | Private investor / MPWT | Before the bid stage |
| The tender for performance-based contract has to be competitive and quality /price based as the experience and skills of the private company would be very important for such arrangement. | MPWT with tender assistance from IFIs | Before the contract award |
| KPIs have to be selected and defined as well as the methods of measuring those indicators. | MPWT with assistance from IFIs | Before the bid stage |
| Institutional capacity of MPWT to manage PPP contracts needs to be developed | MPWT with assistance from IFIs | Over the course of the project |
| Environmental risk assessment has to be undertaken should any road rehabilitation works be required at the road section going through Nam Ha National Biodiversity Conservation Area. | Private investor / MPWT | Before the construction works |

*Source: Mott MacDonald's analysis*

# 5. ASEAN 47 PORTS: MAKASSAR PORT (INDONESIA)



# 5. ASEAN 47 PORTS: MAKASSAR PORT (INDONESIA)

## Project Summary

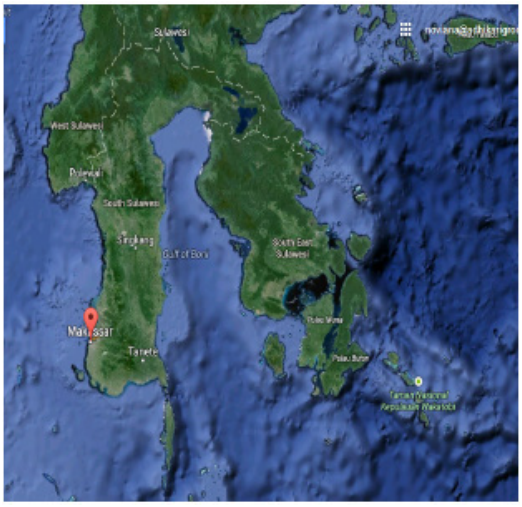



*Figure 1: Project Location in Makassar Strait, South Sulawesi province, Indonesia*

| **Project Details** | | |
|---|---|---|
| **Project Cost** | **Duration** | **Project Implementing Agency** |
| Estimated costs for Phase I (Sections II & III):<br><br>US$425 million | 30 years | Directorate General of Sea Transportation under Ministry of Transport (MOT) |
| **Summary of Project** | | |
| The project involves the implementation of Phase I, Sections II & III, of the Makassar New Port. The following requirements will be made of the private sector:<br>• Finance, design and construct the project, as well as Operations & Maintenance of Phase I (Sections II & III) for specified contract duration<br>• Land reclamation of approximately 30ha area up to under pavement<br>• 680 m wharf comprising 2 berths: 350mx30m and 330mx30m<br>• Container yard infrastructure: pavement and buildings | | |
| Intended Procurement Method | • Phase I was contracted to the State-Owned Port Operator Pelindo IV as a 70 year concession in May 2015.<br>• Phase I (Sections II & III) are yet to be assigned. MOT intends to have a competitive bidding for these sections. | |

| Project Details (cont.) | |
|---|---|
| **Project Background** | |
| Relevance to country and ASEAN connectivity | • Largest port in Sulawesi and the fourth largest container terminal in Indonesia, catering for 700,000 TEUs.<br>• Freight (in particular, containerised) and passenger volumes have grown significantly over the last 5 years.<br>• In the long term, the existing Makassar port is expected to reach full capacity. Hence, the 2013 Makassar Port Master Plan suggests developing Makassar New Port, which comprises container terminal facilities to the north of existing port.<br>• The master plan suggests that the capacity of the port would thus be increased to approximately 3million TEUs by 2032.<br>• Makassar Port is part of the Pendulum Nusantara (marine highway), a sea distribution line operating along the Indonesian west - east axis.<br>• Makassar Port is designated to be a domestic hub port and maritime gateway to the east and south of Indonesia. It connects to the Trans-Sulawesi road and could be an important conduit for natural resources. |
| Scope of overall Makassar New Port | The development of the overall Makassar New Port is planned to be done in three phases:<br>• Phase 1: Reclamation of 46ha of land area for construction of container terminal with capacity up to 1,500,000 TEU's per year. In this phase, 3 docks with total length of 1000 m will be built in stages. Development in this phase will be equipped with access road, container stacking yard and related building facilities. Section I is currently being implemented by Pelindo IV.<br>• Phase 2: Additional container terminal provision, in the form of reclamation and construction of container terminal facilities on 30 ha of area. Facilities prepared in this phase including a dock with length 250 m, container stacking yard, and related supporting building. To be developed in the medium term.<br>• Phase 3: Additional container terminal provision, in the form of reclamation for 30.8 ha of container terminal facilities and 5.8 ha of Roll On - Roll Off (Ro-Ro) terminal. Facilities prepared in this phase are 3 container docks with length 3x250 m and 1 Ro-Ro dock with length 300 m, container stacking yard, yard area for Ro-Ro, and related building facilities. To be developed in the long term.<br><br>After Phases 1, 2 and 3 are completed, an additional area of 111.5ha is envisaged to be developed by 2050. |
| Proposed Structure | • BOT or Business-to-Business (B2B) model with a Pelindo company (likely Pelindo IV or Pelindo II) as the counterparty.<br>• Private sector takes demand risk, but whether the project is a BOT or B2B is dependent on the decision of the Ministry of Transport. |
| Further considerations | • It will be important to further clarify the growth in trade and resultant potential demand for port services to ensure adequate returns to the private sector.<br>• Clarification of the role and function of Pelindo IV, which is the incumbent operator of the existing port, is needed to ensure that other operators can bid on equal footing. Ensuring synergy with Pelindo IV is important, as ensuring smooth operations is projected to raise the EIRR to 24.2%, even with an increased costing (as per Mott MacDonald's estimate).<br>• While tangible synergies are projected by ensuring cooperation with Pelindo IV, it is important to ensure transparency and efficiency in the bid as there is already an incumbent. |

## Full Project Report

### 5.1 Project Scope

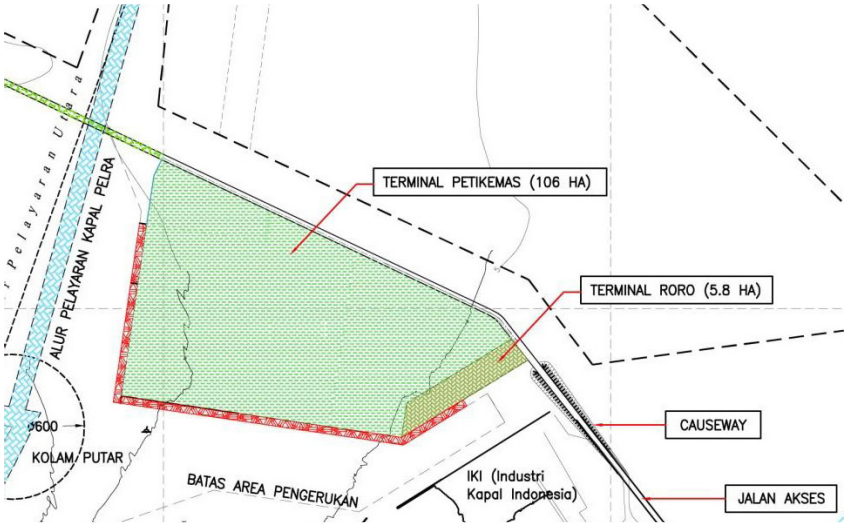



*Figure 2: Diagram of intended Makassar Port project*

Phase 1 of the Makassar New Port development comprises container terminal development involving 46ha of land reclamation, construction of a 1000m long wharf and container yard with a depth of approximately 500m. The container terminal built should have a capacity of up to 1,500,000 TEUs per year. The reclamation area would be connected to the shoreline by a causeway, and further connected by inland road to an existing toll toad. The technical characteristics of the Phase 1 Makassar New Port development project are presented in the table below (includes section I, which is not part of the bid).

**Table 5.1: Project Technical Characteristics**

| Item | Unit | Phase 1 (all sections) |
|---|---|---|
| **Capacity** | **TEU pa** | **1,400,000** |
| **Main Facilities** | | |
| Container terminal area | ha | 46 |
| Berth length | m | 1,000 |
| Breakwater | m | 2,362 |
| Dredging from -11m up to -14 m | ha | 36 |
| CFS area | $m^2$ | 2,200 |
| CFS truck parking area | $m^2$ | 12,000 |
| **Supporting Facilities** | | |
| Flyover/causeway | m | 1,700 |
| Land access road | $m^2$ | 41,400 |

| Table 5.1: Project Technical Characteristics (cont.) | | |
|---|---|---|
| **Supporting Facilities** | | |
| Circulation Road | $m^2$ | 210,000 |
| Container operational office | $m^2$ | 1,000 |
| Maintenance workshop | unit | 1 |
| Gate | unit | 1 |
| Supporting facilities area | $m^2$ | 5,000 |
| **Equipment** | | |
| Quay crane | unit | 7 |
| RTG crane | unit | 21 |
| Head truck | unit | 35 |
| Chassis | unit | 42 |
| Reach stacker | unit | 2 |
| Forklift | unit | 10 |

*Source: Ministry of Transport Indonesia*

Specifically to Phase 1, Sections 2 & 3, the following requirements will be made of the private sector, among others:

- Land reclamation of approximately 30ha area up to under pavement
- 680 m wharf comprising 2 berths: 350mx30m and 330mx30m
- Container yard infrastructure: pavement and buildings

## 5.2 Traffic Projections and Preliminary Assessment

Table 2 below gives preliminary projections of traffic for the intended Makassar Port Phase I expansion, including all sections:

| Table 5.2: Base case container trade forecast assumptions, TEUs | | | | | |
|---|---|---|---|---|---|
| **Year** | **Overall Makassar Port** | **Existing Makassar port** | **New Makassar Port (Phase 1 Section 1)** | **New Makassar Port (Phase 1 Sections 2&3)** | **New Makassar Port (Phase 1 all Sections)** |
| 2015 | 743,423 | **700,000** | | | |
| 2018 | 927,051 | 700,000 | 227,051 | | 227,051 |
| 2021 | 1,145,756 | 700,000 | **400,000** | 45,756 | 445,756 |
| 2024 | 1,406,236 | 700,000 | 400,000 | 306,236 | 706,236 |
| 2027 | 1,716,472 | 700,000 | 400,000 | 616,472 | 1,016,472 |
| 2030 | 2,085,968 | 700,000 | 400,000 | 985,968 | 1,385,968 |
| 2031 | 2,224,200 | 700,000 | 400,000 | **1,000,000** | **1,400,000** |
| 2034 | 2,690,680 | 700,000 | 400,000 | 1,000,000 | 1,400,000 |

| Table 5.2: Base case container trade forecast assumptions, TEUs (cont.) | | | | | |
|---|---|---|---|---|---|
| **Year** | **Overall Makassar Port** | **Existing Makassar port** | **New Makassar Port (Phase 1 Section 1)** | **New Makassar Port (Phase 1 Sections 2&3)** | **New Makassar Port (Phase 1 all Sections)** |
| 2037 | 3,246,266 | 700,000 | 400,000 | 1,000,000 | 1,400,000 |
| 2040 | 3,907,977 | 700,000 | 400,000 | 1,000,000 | 1,400,000 |
| 2043 | 4,696,086 | 700,000 | 400,000 | 1,000,000 | 1,400,000 |
| 2046 | n/a | 700,000 | 400,000 | 1,000,000 | 1,400,000 |
| 2050 | n/a | 700,000 | 400,000 | 1,000,000 | 1,400,000 |

*Source: Pre-feasibility study of Makassar New Port Phase 1 by IndII*

Based on the above assumptions, Section 1 of Makassar New Port would reach the capacity by 2021, and Sections 2 & 3 has a slow ramp up in the first several years of the Project and would reach the capacity by 2031.

As for tariff levels, the average tariff of USD 70-90 per TEU handled was indicated by an interested private investor as a minimum to attract their interest. For the base case, a USD 90 tariff per TEU handled was assumed, with an escalation every three years.

## 5.3 Costs and Preliminary Assessment

Table 3 outlines the MOT 2013 Master Plan cost estimate for Phase 1 development, adjusted to real 2015 IDR/USD values. It is noted that there is a discrepancy between the below adjusted cost estimate (USD$370M total, at 2015 prices) and the lump sum estimate for the development now quoted by MOT (USD$450M).

| Table 5.3: Estimated Project Costs (Construction) for Makassar New Port (all sections) | | | | |
|---|---|---|---|---|
| **Item** | **Volume** | **Unit** | **Cost (2012), IDR million** | **Cost (2015), USD million*** |
| Reclamation work | | | 1,115,612 | 100 |
| Dredging Area of Port Basin (m) LWS | 2,525,000 | $m^3$ | 227,250 | 20 |
| Container Terminal Area Infrastructure | | | 1,560,974 | 141 |
| Superstructure Container Terminal Area | | | 697,112 | 63 |
| **Subtotal** | | | **3,600,948** | **325** |
| Consultancy cost (4%) | | | 144,038 | 13 |
| VAT (10%) | | | 360,095 | 32 |
| **TOTAL** | | | **4,105,081** | **370** |

*Source: MOT*

** Costs in USD have been estimated assuming y-o-y inflation of 6.4% and prevailing exchange rate in 3rd quarter 2015*

The following are some observations on the above costings:

- Applying uplifts for management costs, investigation/study/approval costs and inclusion of a development contingency would lift the above estimate to around USD$450M. This could be a potential explanation for the difference between the cost given by MOT in the Master Plan versus its current figure.
- IndII, the Indonesia Infrastructure Initiative funded by Australian Aid, also conducted its own study for the project. While there are some differences between what is proposed by IndII (berth arrangements) compared to MOT's study, the scope of development is not dissimilar. It is therefore positive that two alternative cost estimates for a comparable development at the site are of the same order. The level of design detail is still preliminary however and costs may vary materially from this prediction.

Since the above estimates were for the whole of Phase I, an estimate had to be obtained specifically for Sections 2 and 3, where there was private participation. However, the WB team[6] considers that the costs in the MOT study are under-estimated; therefore a high-level bottom-up cost estimate based on experience of similar transactions has been developed. According to this estimate, the costs for Phase I, Sections 2 & 3 are estimated to be closer to US$425 million, as shown in the following table:

**Table 5.4: Estimated Project Costs (Construction) for Makassar Port (Sections 2 & 3)**

| Works Item | Unit | Quantity | Total cost, USD million (2015) | Mott MacDonald's notes |
|---|---|---|---|---|
| Access road works | | | | |
| Onshore Access Road | LS | - | 0 | Assumed developed fully in Section 1 by Pelindo IV |
| Access Road/Causeway | km | - | 0 | Assumed developed fully in Section 1 by Pelindo IV |
| Dredging and reclamation | | | | |
| Dredging | $m^3$ | 1,010,000 | 30.3 | Assumed 60% in developing Section 1 |
| Navigational Aids | LS | - | 0.6 | Assumed 75% in developing Section 1 |
| Reclamation Treatment | $m^2$ | 310,000 | 4.7 | The reclamation method is assumed as surcharge and wick drains |
| Revetment Structure | m | 1,100 | 16.5 | - |
| Container terminal facilities | | | | |
| Berth Structures | m | 680 | 83.8 | Assumed two berths: 330m + 350m |
| Terminal Topside Development | $m^2$ | 310,000 | 108.5 | Includes cost of civil and services works |
| Design and Management | % | - | 24.4 | Assumed 10% of construction works cost |
| Equipment & Systems | | | | |

[6] Including Mott MacDonald, engaged by the WB as technical advisors.

| Table 5.4: Estimated Project Costs (Construction) for Makassar Port (Sections 2 & 3) (cont.) | | | | |
|---|---|---|---|---|
| **Works Item** | **Unit** | **Quantity** | **Total cost, USD million (2015)** | **Mott MacDonald's notes** |
| TOS, IT, Management Systems etc | LS | - | 0 | Assumed that Section 1 will form part of Section 2 |
| STS Cranes | No | 8 | 60.0 | Assumed capacity 125,000 TEU / crane / year |
| RTGs | No | 24 | 24.0 | Assumed 3 RTGs supporting each STS (average) |
| TTs | No | 40 | 32.0 | Assumed 5 TTs supporting each STS (average) |
| Reach Stackers | No | 8 | 1.6 | Assumed 1 RS supporting each STS (average) |
| Taxes | % | | 38.6 | 10% |
| **TOTAL CAPEX** | | | **425** | |

*Source: Mott MacDonald's analysis*

The above costs exclude land acquisition (which are to be borne by local authority of Makassar) costs, road and utility network upgrades and operational performance improvement costs at the existing facility.

As for the operating cost, the MOT's master plan did not provide any estimate. The WB team assumes this would be an annual cost of 30 USD per TEU handled. In addition, the concessionaire would be required to pay regular concession fees to the MoT of 2.5% of revenue, which is what the Pelindo entities are paying now.

Lenders and sponsors will have to do their own due diligence on project costs.

## 5.4 Intended and Proposed Structure

There were four models that were considered for private sector involvement for the Makassar Port project, and the main difference between each of the models was the apportionment of responsibility between the public and private sectors. These four models are given in table 5.5 below:

| Table 5.5: Possible Options for Private Participation in Makassar Port | |
|---|---|
| **Type of Model** | **Characteristics of Model** |
| Landlord Port model | Requires a landlord port authority with a strong balance sheet and institutional capacity that would plan and finance the core infrastructure, such as berthing and channels, provide utilities and land infrastructure, lease the facilities to private operators through competitive tender, and consequently, collect land rentals, port dues and royalties. |
| Tool Port model | Represents a very low risk to investor as only items of yard equipment and labour are privately supplied. This model is considered as only a minor form of PPP as it does not offer meaningful competition to the current terminal operator and does not result in efficiency benefits, which classic PPP would offer. |
| Development Rights model | The private investor buys the right to build new port assets and has exclusive use of them for a fixed period of time before transferring them over the public sector.<br>The private investor generally is expected to finance all the infrastructure assets, including such capital intensive items as dredging and land reclamation.<br>Private sector to take demand risk. |
| Business to Business (B2B) model | The term B2B is specific to Indonesia, and assumes that current state-owned port operator contracts with the private sector to potentially finance, construct and operate certain port facilities and equipment. The partnership could take the form of a Landlord or Tool port model, with the state-owned port operator taking on the role of the Port Authority instead.<br>Generally, in Indonesia state-owned port operator Pelindo and the private operator would set-up a Joint Venture (JV) in which Pelindo has an influential or controlling stake. Each party can commit various assets or service provision as its contribution towards the joint venture capital base, allowing for flexible and adaptive arrangements.<br>Private sector to take demand risk. |

The WB team considers both BOT and B2B models workable for private sector involvement in the Indonesian context. However, since Pelindo IV is the incumbent operator for Makassar Port Phase I in both BOT and B2B models, there would be a potential operational conflict if the winning party for Sections 2 & 3 of Makassar New Port is other than Pelindo IV. However, this could be potentially solved if agreements on usage of landside access road and other shared facilities are reached.

It is unlikely that the Government of Indonesia will be able to directly finance the Makassar Port expansion as plans have been announced to fund additional maritime infrastructure through the State-Owned Enterprises.

## 5.5 Any Technical Issues

Based on the available information, the proposed development is unlikely to have significant unforeseeable technical issues. Container terminals productivity levels appear to be reasonable. The level of site studies undertaken appears satisfactory for feasibility stage.

## 5.6 Other Relevant Issues

Pelindo IV is the operator of the existing Makassar Port and Phase I Section I has also been awarded to the SOE. Due to the extensive involvement of Pelindo IV, ensuring that Pelindo IV's incentives are aligned with the operator for Phase I Sections 2 & 3 is critical to ensure smooth operations of the overall port. While this would not be an issue should the bid be eventually awarded to Pelindo IV (even if a B2B arrangement is pursued thereafter), there could be competition and coordination risk if another operator is awarded Sections 2 & 3. As such, it is important to spell clearly the rights and responsibilities of the incumbent vs. new operators with respect to the overall port infrastructure to provide adequate transparency and comfort to investors. Relevant areas where Pelindo IV could have an advantage include:

- Towage and pilotage services
- Harbour control functions
- The new terminal access road

This potential issue could be raised with the Government during the process of investor consultations.

## 5.7 Further Actions Needed

The following summary has been developed on the basis that a B2B PPP model is implemented for Phase 1 (combining the Pelindo IV's Section 1 with the B2B entity's Sections 2 and 3), and lists the actions that need to be taken for the project to progress as a PPP:

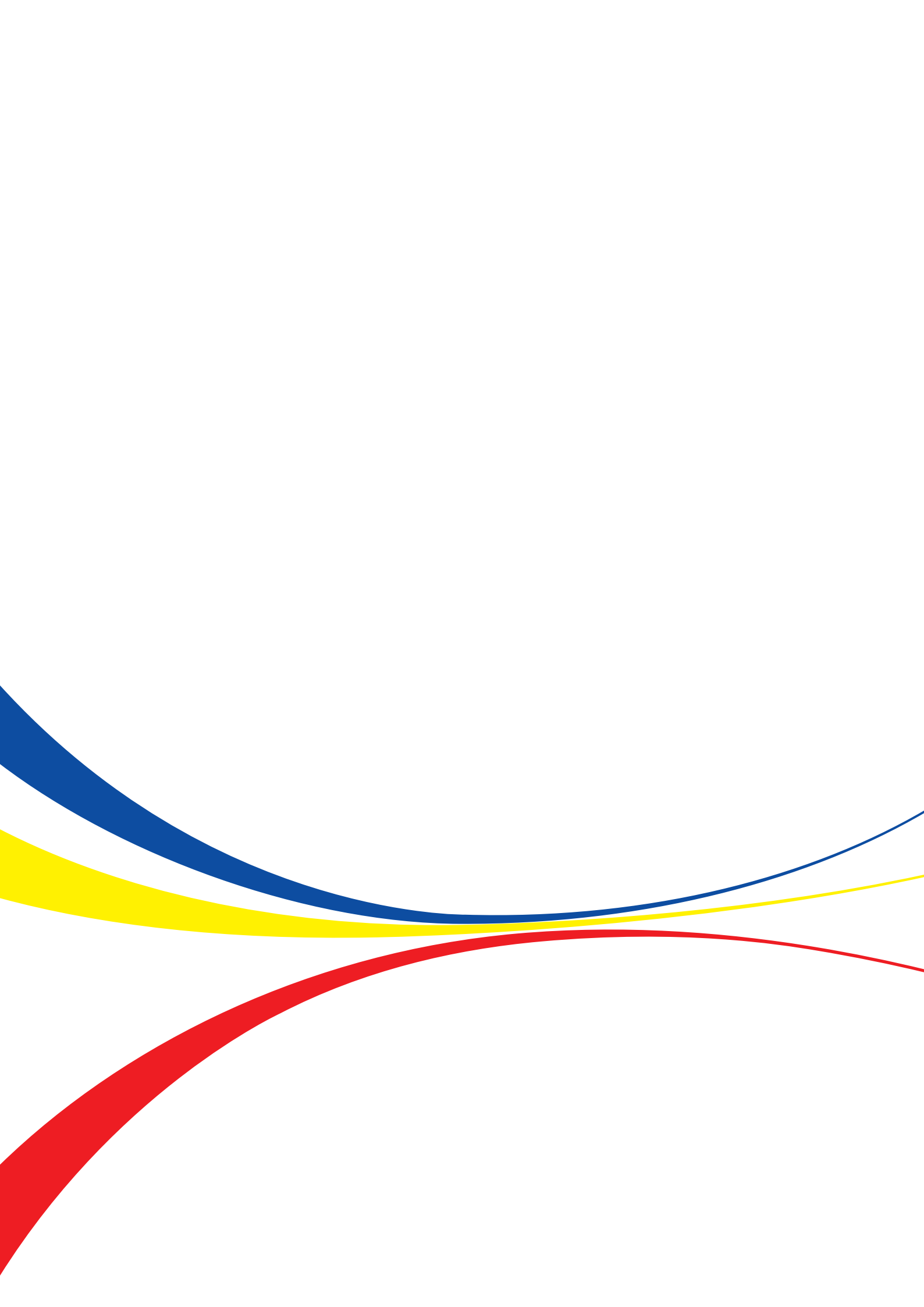
**Table 5.6: List of actions to take for PPP**

| Potential Issue | Responsibility and recommended action | Timeframe |
|---|---|---|
| Strengthening of fleet and trade forecast to achieve a bankable level of detail and accuracy. | MOT / Pelindo IV / Private investor | Before the bid stage |
| Further development of the planning and design to a bankable feasibility level (geotechnical investigation for Sections 2 and 3, navigation studies, reclamation study) | MOT / Pelindo IV / Private investor | Before the bid stage |

| Table 5.6: List of actions to take for PPP (cont.) | | |
|---|---|---|
| **Potential Issue** | **Responsibility and recommended action** | **Timeframe** |
| In case private sector requires some government guarantees to protect against Pelindo IV's related contractual defaults, IIGF is currently exploring the possibility of providing such guarantees for B2B port models. | Pelindo IV / IIGF<br>Pelindo IV would need to obey to the process of bidding and contracting that would be qualified as similar to PPP. | Before the bid stage |
| Land acquisition for inland access road. | Local government of South Sulawesi / Pelindo IV | As part of Pelindo's Section 1 mandate and within the allocated timeframe (by 2017) |
| In case other party than Pelindo IV gets the contract for Sections 2&3, agreements need to be established between Pelindo IV and other winning party on the usage of access road and other shared facilities to avoid operational conflict. | Pelindo IV/ MOT/winning company of Section 2 & 3 | Before the operation |

*Source: Mott MacDonald's analysis*

# 6. MANADO-BITUNG TOLL ROAD (INDONESIA)



# 6. MANADO-BITUNG TOLL ROAD - INDONESIA

## Project Summary

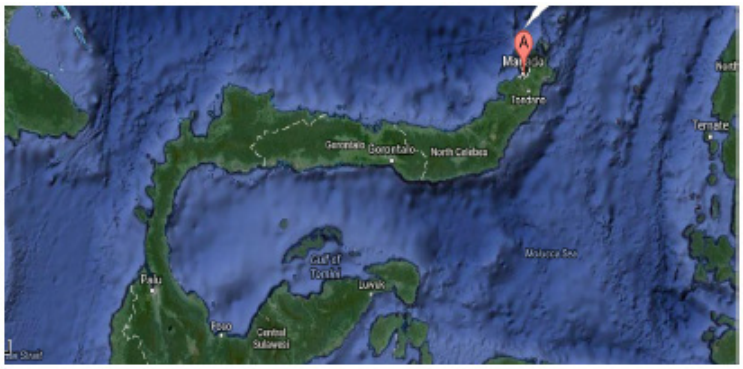



*Figure 1: Project Location in North Sulawesi province, Indonesia*

| **Project Details** | | |
|---|---|---|
| **Project Cost** | **Duration** | **Project Implementing Agency** |
| Section II Estimated cost (2015 prices): IDR 2.7 trillion | 45 years | Indonesia Toll Road Authority (BPJT) under Directorate General of Highways (Bina Marga), Ministry of Public Works (MoPW) |
| **Summary of Project** | | |
| The project involves the construction of Section II, as well as the Operations & Maintenance of Section I & II under a Supported-BOT scheme.<br><br>The project is a priority project on the Government of Indonesia's list, and approval has been obtained from the KPPIP (Committee for Acceleration of Prioritised Infrastructure Delivery, a high level committee consisting of relevant ministries) as a priority project to speed up necessary government approvals. Land acquisition for Section 1 (starting in Manado) is reported to be 89.26% complete. Land acquisition for Section II has yet to start. | | |
| Intended Procurement Method | • Section I of the toll road was financed and constructed by the Ministry of Public Works.<br>• The construction of Section 2 and the operations & maintenance of Sections 1 & 2 are yet to be assigned. MOT intends to have a competitive bidding for a supported-BOT for this package. | |
| **Project Background** | | |
| Relevance to country and ASEAN connectivity | • Manado and Bitung are two major economic centres in North Sulawesi. Manado has an established passenger ferry terminal, while there are plans to establish Bitung as an international hub port. | |

| Project Details (cont.) | |
|---|---|
| **Project Background** | |
| Scope of Toll Road | • The intended project aims to connect Manado with Bitung. Section I is from Manado – Airmadidi (13.5km) and Section II is from Airmadidi – Bitung (25.5km).<br>• There are plans for a 500-hectare Tanjung Merah Special Economic Zone in Bitung, with a focus on palm oil, fishery and packaging industries. The road will be important in connecting goods produced to the ports.<br>• Enhancing the link between Manado and Bitung is likely to enhance economic activity in North Sulawesi. |
| **World Bank Analysis** | |
| Proposed Structure | • The government could consider providing availability payments.<br>• Available traffic studies show that there is potential room for traffic growth in the area, but this will come in the later part of the project. This growth could also be subject to variability, depending on whether other planned initiatives in the area are implemented (e.g. Special Economic Zone).<br>• On the other hand, capital expenditures for the project (construction of Section II) will be large and incurred at the start of the project. The ability of positive cash flows from operating Section I to offset negative cash flows for Section II will need further assessment.<br>• The government could consider providing availability payments to offset the initial funding needs and provide an adequate rate of return to the private sector. |
| Further considerations | • To increase the attractiveness of the project to the private sector, the Toll Road Agency could consider requesting for a guarantee from the Indonesia Infrastructure Guarantee Fund to cover the risk of land acquisition, government payments, etc. as there is substantial government support for the project. |

# Full Project Report

## 6.1 Project Scope


*Figure 2: Diagram of intended Manado-Bitung Toll Road project*

The following table summarises some key technical characteristics of the project.

**Table 6.1 Project Technical Characteristics**

| Parameter | Value |
|---|---|
| Length | 39.0 km |
| Lane set up | 2 x 2 lanes plus hard shoulder in the initial stage<br>2 x 3 lanes plus hard shoulder in the final stage |
| Road Width/ lane | 3.60 m (rural)<br>3.50 (urban) |
| Outer Shoulder | 3.00 m (rural)<br>2.00 (urban) |
| Inner Shoulder | 1.50 m (rural)<br>0.50 (urban) |
| Median (including inner shoulder) | 5.50 m (rural)<br>3.00 (urban) |
| Design Speed | 100 km/h |
| Structures | 29 |
| Interchanges | 6 |
| Construction Duration | Three years and four months |
| Concession duration | 45 years |

*Sources: Ministry of Public Works and Bina Marga*

The outline alignment of the toll road appears to circumnavigate the urban areas of Manado and Bitung. Land acquisition for Section 1 (starting in Manado) is reported to be 89.26% complete. From the high level perspective, section 2 and 3 of the toll road do not appear to cross significant urban areas. The social impact through resettlement could be therefore limited. However, the environmental impact can be significant and thus could impact the project programme. From previous experience in Indonesia, in general, urban areas tend to bear larger programme impacts in land acquisition than environmental considerations outside of urban areas.

The outline design envisages six interchanges to connect the toll road with the network. The interchanges are placed every five to eight kilometres. The detail of design (for a feasibility study) is relatively advanced. The interchange sizing does not appear to be excessive or overly complex.

## 6.2 Traffic Projections and Preliminary Assessment

Table 6.2 below gives preliminary projections of traffic for the intended Manado-Bitung toll road:

**Table 6.2: Project Traffic Forecast**

| Segment | 2015 | 2016 | 2017 | 2018 | 2019 | 2024 | 2029 | 2034 | 2044 | 2054 | 2059 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring Road-Sukur | 12,662 | 13,929 | 15,600 | 17,784 | 20,630 | 39,705 | 61,637 | 82,476 | 130,543 | 193,236 | 235,101 |
| Sukur-Airmadidi | 12,662 | 13,929 | 15,600 | 17,784 | 20,630 | 39,705 | 61,637 | 82,476 | 130,543 | 193,236 | 235,101 |
| *Implied growth pa* | | *10%* | *12%* | *14%* | *16%* | *14%* | *9%* | *6%* | *10%* | *8%* | *4%* |
| Airmadidi-Kauditan | 10,937 | 12,031 | 13,474 | 15,361 | 17,818 | 34,295 | 53,237 | 71,237 | 112,754 | 166,903 | 203,063 |
| Kauditan-Danowudu | 10,937 | 12,031 | 13,474 | 15,361 | 17,818 | 34,295 | 53,237 | 71,237 | 112,754 | 166,903 | 203,063 |
| Danowudu-Bitung | 10,937 | 12,031 | 13,474 | 15,361 | 17,818 | 34,295 | 53,237 | 71,237 | 112,754 | 166,903 | 203,063 |
| *Implied growth pa* | | *10%* | *12%* | *14%* | *16%* | *14%* | *9%* | *6%* | *10%* | *8%* | *4%* |

*Source: Feasibility Study by government of North Sulawesi*

A traffic study has been carried out as a part of the feasibility study conducted by the local government of North Sulawesi. Primary and secondary surveys have been carried out to create baseline data. The study considered that in line with the overall rapid development of the Manado region and the surrounding areas the expected traffic will be annually growing by over 8%. However, no explanation has been given for the reason why much higher growth rates (e.g. 16% in 2019) have been used in the forecast.

Mott MacDonald considers the demand at the beginning of the project to be too low to generate strong investor interest. Conversely, in later years, the traffic forecasts exceed the capacity of a 2X3 lane road and are therefore not achievable. In addition, Mott MacDonald considers the year-on-year growth estimates to be on the optimistic side. Whilst growth rates in a similar range have been observed in projects in Indonesia, these are generally in regions with stronger economic growth. Mott MacDonald also notes that the traffic forecast has been developed for only two sections of the road, rather than for each section between the interchanges. The growth rates for both calculated sections appear to be equal; this indicates that the model assumes an overall view of demand rather than local traffic demand.

The high level drawings appear to imply that a number of local alternatives are available for local traffic to avoid the toll road. Therefore, the business case is likely to be based on the assumption that the toll road will have a high volume of through traffic, such as business and commercial trips that are more likely to value time and journey time reliability. This is a potentially significant risk, as the completion of the Bitung Port project and development of Bitung Economic Zone are uncertain and if they do progress, they are challenging endeavours and might take a long time to materialise.

The FS estimates the value of time for the project based on a calculation by Jasa Marga in 1989. This assumption could be of limited value as presumably the underlying basics have significantly changed in the past 25 years. Thus, the assumed toll tariff of IDR 700 per kilometre might be appropriate for a toll road in Jakarta but on a high side in North Sulawesi. Values below IDR 500 per kilometre would be considered more typical. However, a comprehensive analysis is recommended. For example, higher tolls might reduce the traffic demand but the revenue might be higher.

Consequently, revenue forecasts based on such assumptions are considered neither robust nor reliable. Lenders and sponsors will have to do their own due diligence to assess potential revenues.

## 6.3 Costs and Preliminary Assessment

Table 6.3 presents the total investment cost estimate as given in the FS and adjusted to real 2015 IDR/USD. Total estimated project investment cost (including cost of financing and land acquisition) is USD 423 million. If the cost of financing, taxes and ROW acquisition cost are excluded, the total project cost comes to USD 320 million.

| Table 6.3: Project Estimated Costs (construction) | | | |
|---|---|---|---|
| **Cost Item** | **million IDR (2010 prices)** | **million USD* (2015 prices)** | **Implied percentage share** |
| Engineering Design | 50,960 | 5 | 1.6% |
| Construction | 2,547,982 | 254 | 79.5% |
| Toll Equipment | 38,220 | 4 | 1.2% |
| Construction supervision | 50,960 | 5 | 1.6% |
| Escalation | 352,615 | 35 | 11.0% |
| Contingency | 127,399 | 13 | 4.0% |
| Overhead | 38,220 | 4 | 1.2% |
| Sub-Total (excl. taxes, ROW, cost of financing) | **3,206,356** | **320** | **100%** |
| VAT (10%) | 316,814 | 32 | - |
| ROW | 400,000 | 40 | - |
| Financial Cost | 41,193 | 4 | - |
| Interest During Construction (IDC) | 278,091 | 28 | - |
| **TOTAL** | **4,242,454** | **423** | **-** |

*Source: FS by government of North Sulawesi, Mott MacDonald's analysis*

** Costs in US$ have been estimated applying inflation up to 2015 and prevailing IDR to US$ exchange rate in 3rd quarter 2015*

However, the WB team estimates that the costs are on the high side, according to other benchmark projects.

To derive the CAPEX costs for Section II, the cost/km for the whole route was applied pro rata to Section II. In addition, taking into account widening works in the 20th and 24th year of operation that were not budgeted for in the original feasibility study[7], the following cost estimates were derived:

| Table 6.4: Overall Project Cost Assumptions | |
|---|---|
| **Cost** | **IDR million (2015 prices)** |
| Capex (total) | 2,703,101 |
| Capex of widening Section I to 6 lanes | 233,548 |
| Capex of widening Section II to 6 lanes | 432,496 |
| Operation and Routine Maintenance per year | 2% of capex |
| Periodic Maintenance, every 5 years | 5% of capex |

*Source: Feasibility Study and Mott MacDonald analysis*

[7] Mott MacDonald assumed 16% of original capex, provided all necessary space for widening has been provided during initial construction and no major earthwork is required.

The feasibility study assumes OPEX to be USD 5-6 million annually, and every 5th year of operation an additional USD 5-6 million is needed for lifecycle maintenance.

Lenders and sponsors will have to do their own due diligence to assess these cost estimates.

## 6.4 Intended and Proposed Structure

A 'supported BOT model' has been envisioned by the government for Manado – Bitung Toll Road in the form of government funding support being planned for land acquisition for both Sections I and II, and construction of Section I (Manado Ring Road interchange – Airmadidi interchange). Section II of Manado-Bitung Toll Road (Airmadidi interchange – Bitung interchange ) will be procured as a BOT, followed by the O&M contract for the entire length of the toll road (Section I and II); both contracts being wrapped up in one PPP agreement.

The key features of the approach are summarised below:

- It is expected that the construction of Section I is completed before Section II commences. The private sector can start operation of the Section I on behalf of the implementing agency (BPJT) under concession agreement, and recover its investment for Section II early through charging and collecting toll revenues from the road users on Section I.
- For Section II, BPJT will contract with the private sector to finance, design and construct the Project. Once Section II is commissioned, the private sector will operate Sections I and II as a whole.
- The ownership of the expressway will be transferred to the BPJT at the end of PPP contract.
- The duration of PPP contract during road operational phase is 45 years from the start of commercial operation of Section I.
- Delivering this project as currently intended by the government is expected to increase the private sector's market appetite for the project. At the time of construction of Section II, Section I would have been expected to be generating cash flow through tolls, therefore having positive contribution on the total operating cash flow.
- Government would be responsible for the land acquisition and will bear resettlement cost for the whole route.
- Private sector will have to take interface risk, i.e. risk associated with the quality of the design and construction of the Section I.

Available traffic studies show that there is potential room for traffic growth in the area, but this will come in the later part of the project. This growth could also be subject to variability, depending on whether other planned initiatives in the area are implemented (e.g. Special Economic Zone).

On the other hand, capital expenditures for the project (construction of Section II) will be large and incurred at the start of the project. The ability of positive cash flows from operating Section I to offset negative cash flows for Section II will need further assessment as it could be that overall project costs significantly exceed project revenues during that period.

The government could consider providing availability payments to offset the initial funding needs and provide an adequate rate of return to the private sector. These availability payments should be calculated to cover private company's cost for road operating and maintenance, cost of financing the road construction, profit margin and other associated cost.

## 6.5 Any Technical Issues

The road will be circumnavigating Mount Klabat, the highest volcano on the Sulawesi Island with nearly 2,000 metres above the seal level. Also, the technical advisor considers landslides to be a likely issue during the operation phase and therefore would recommend a comprehensive analysis in areas of potential slopes and embankments. The area the road is traversing is in a range of flat to hilly to mountainous terrain, and significant rivers will have to be crossed. While no exceptional technical issues are currently encountered, given the complex terrain and required multiple structures the project will require more attention to design and construction than an average toll road project in ASEAN.

## 6.6 Other Relevant Issues

More robust revenue and cost estimates are needed to increase the reliability of assessments.

## 6.7 Further Actions Needed

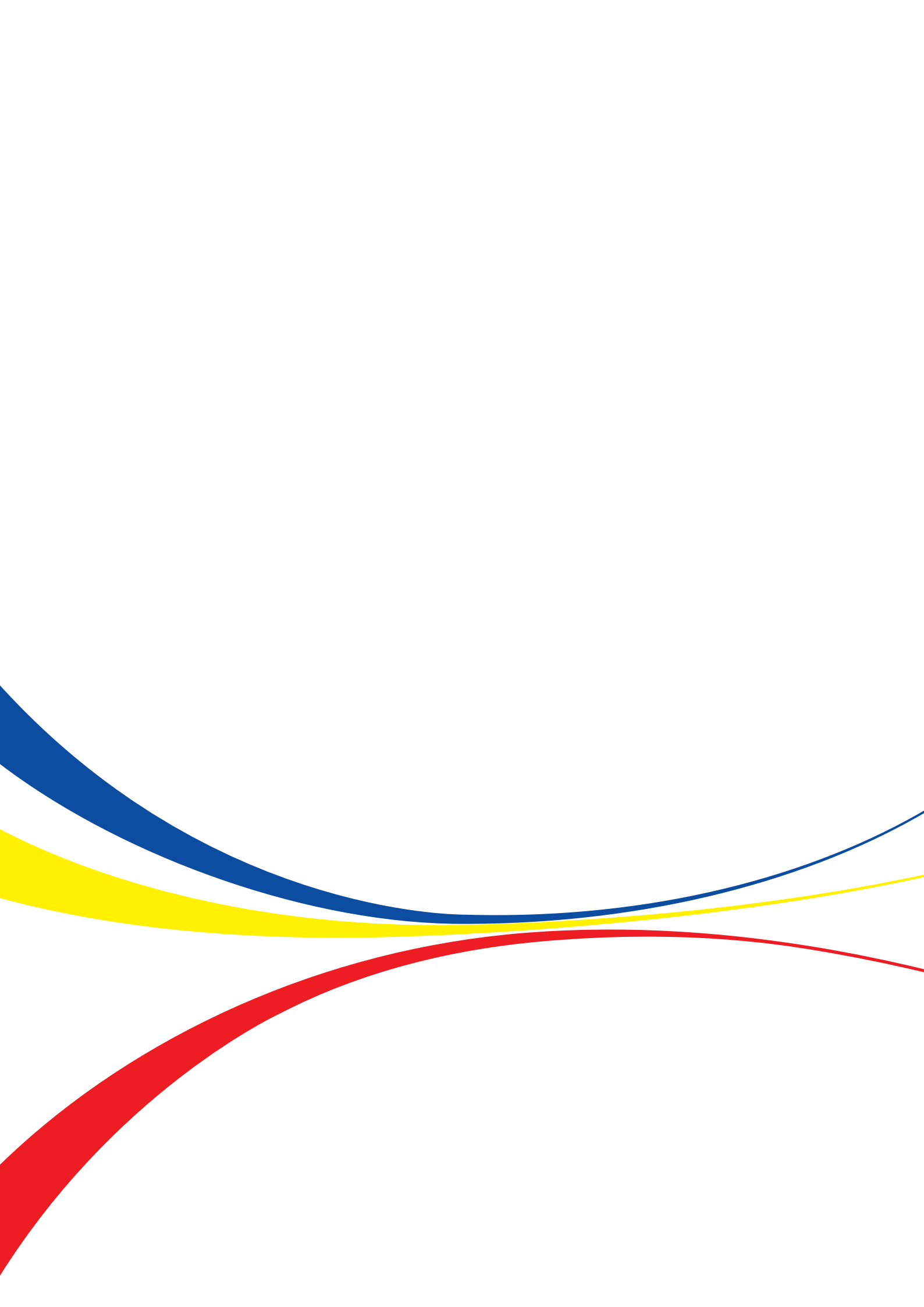
The following table lists the actions that need to be taken for the project to progress as a PPP:

**Table 6.5: List of Actions to take for PPP**

| Potential Issue | Responsibility and recommended action | Timeframe |
|---|---|---|
| More in-depth traffic forecast studies has to be prepared | Private Investor | Before the bid phase |
| Location permits are to be renewed for Section II, so that actual land acquisition implementation could start | MoPW with support of CMEA / KPPIP, Local government of North Sulawesi | Before the bid phase |
| Land acquisition implementation | Local government of North Sulawesi and BPN | At least 70% before the start of construction |
| Outline Business Case needs to be completed, including requirements for VGF or government guarantees. | MoPW | Before the bid phase |
| In-principal approval of Outline Business Case | MOF | Before the bid phase |
| Final Business Case needs to be completed | PPP Unit of MOF / with assistance of international transaction advisor | Before the project award |
| Final approval of business case | MOF | Before the project award |

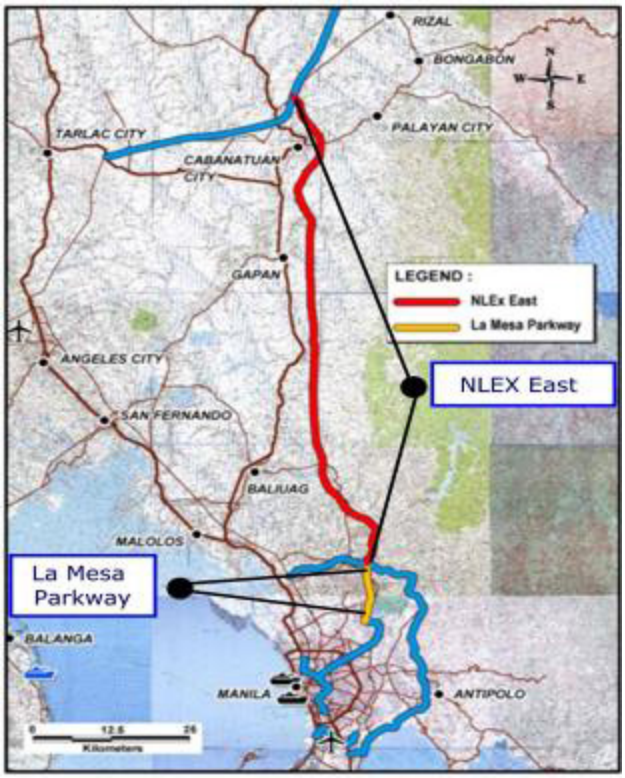
*Source: Mott MacDonald's analysis*

# 7. NORTH LUZON EXPRESSWAY EAST PROJECT (PHILIPPINES)



# 7. NORTH LUZON EXPRESSWAY EAST PROJECT (PHILIPPINES)

## Project Summary




*Project Location: Nueva Ecija and Bulacan Provinces in Philippines*

| **Project Details** | | |
|---|---|---|
| **Project Cost** | **Duration** | **Project Implementing Agency** |
| *Local consultant estimate (2015 prices)*<br>CAPEX: PHP 49,520 million<br>OPEX : PHP 941 million yearly<br>PHP 1,108 million (5-yearly periodic maintenance) | 30 years from start of commercial operations | Department of Public Works and Highways (DPWH) |
| **Summary of Project** | | |
| Construction and operation of 2x2 lanes and 92.1km long toll road linking Metro Manila to north-eastern part of Luzon[8]. | | |

[8] As of 9 March 2016, the project scope for the North Luzon Expressway East project is being reviewed to check for a possible conflict with the alignment of the Plaridel Bypass Phase II Project.

| Project Details (cont.) | |
|---|---|
| **Summary of Project** | |
| Intended Procurement Method | • The Philippines has successfully awarded a few projects on a Build-Transfer-Operate (BTO) basis, and the private sector (local firms) has been comfortable taking traffic/revenue risk for these projects, as the projected traffic has been strong. |
| **Project Background** | |
| Relevance to country and ASEAN connectivity | • The proposed expressway running parallel to the east of Pan-Philippine Highway is intended to decongest the busy Pan-Philippine Highway, and will enhance transport network and accessibility between provinces and municipalities particularly in Central Luzon Region.<br>• Outline business case for this project to be procured as a PPP has been completed by DPWH in 2013. The project is one of the five DPWH priority projects to be developed as PPPs. |
| Scope of Overall Project | The expressway is split into four sections:<br>• Section I (30.9km): Bigte-San Miguel-Jct. Biak Na Bato Road<br>• Section II (30.6km): San Miguel-Jct. Biak Na Bato Road-Gapan City-Jct. Fort Magsaysay Road<br>• Section III (17.6km): Gapan City-Jct. Fort Magsaysay Road-Cabanatuan City-Jct. Palayan City Road<br>• Section IV (12.0km): Cabanatuan City-Jct. Palayan City Road-Central Luzon Link Expressway (CLLEX-2) |
| **World Bank Analysis** | |
| Proposed Structure | • A BTO model, with the possibility of substantial government support via Viability Gap Funding (subsidy) or availability payments.<br>• Given the large size of the project and the possibility of needing international finance, working with International Finance Institutions to provide guarantees could be a way of mitigating sovereign-related risk (e.g. tariff escalation risk). |
| Further considerations | • Historical evidence and anecdotal evidence from private investors shows that political resistance to tariff escalation has resulted in government not implementing tariff adjustments on time for existing projects (e.g. tariffs on the SCTEx toll road were not increased since 2011). Hence, tariff escalation risk needs to be considered for the project. |

## Full Project Report

### 7.1 Project Scope

The proposed alignment of NLEX East comprises the following sections:

- Section I (30.9km): Bigte-San Miguel-Jct. Biak Na Bato Road
- Section II (30.6km): San Miguel-Jct. Biak Na Bato Road-Gapan City-Jct. Fort Magsaysay Road

- Section III (17.6km): Gapan City-Jct. Fort Magsaysay Road-Cabanatuan City-Jct. Palayan City Road
- Section IV (12.0km): Cabanatuan City-Jct. Palayan City Road-Central Luzon Link Expressway (CLLEX-2)

Segment 1 crosses one major river (Angat River) and two minor rivers (Bayabas River and Maasim River). Four interchanges are proposed to be constructed with a general spacing of ten kilometres between each other. This is considered to be typical for rural highways.

Segment 2 crosses two major rivers (Sumacbao River and Peñaranda River) and three minor rivers (Balacag River, San Miguel, and Malibay River). In addition, two major road overpasses will cross the San Miguel-Sibul Springs Road and the Papaya-Jct. Fort Magsaysay Road.
Segment 3 crosses two minor rivers (Tabuating River and Cabu Creek). Two inter changes around ten kilometres apart from each other are proposed.

Segment 4 crosses one major river (Pampanga River) and one minor river (Kamandug Creek). One interchange is proposed to be constructed.

No outline design of interchanges has been carried out. Such design would be expected to be procured before the tender commencement. Due to the location of the road, Mott MacDonald would not expect overly complex or extensive interchange design.

The following table summarises some key technical parameters of the project.

**Table 7.1: Project Technical Characteristics**

| **Parameter** | **Value** |
|---|---|
| Length | 92.1 km |
| Lane set up | 2 x 2 lanes |
| Road Width/ lane | 3.65 m |
| Outer Shoulder | 3.00 m |
| Inner Shoulder | 1.25 m |
| Median (excluding inner shoulder) | 4.0 m |
| Design Speed | 100 km/h |
| Bridges | 12 |
| Interchanges | 8 |
| Construction Duration | 5 years |
| Concession duration | 25-35 years |

*Source: DPWH*

## 7.2 Traffic Projections and Preliminary Assessment

The prime economic driver for the regions of Nueva Ecija and Bulacan remains agriculture. However, the province of Bulacan is increasingly becoming industrialised, due to its proximity to Metro Manila.

The traffic study was carried out as part of the Outline Business Case (OBC), and appears to be professionally developed, using the following methodology:

- Review of available traffic data, including the compilation and review of existing data and related studies.
- Conduct of several primary data collection activities, such as road inventory survey, traffic count survey, road side interview, and stated preference survey.
- Development of a traffic model.
- Traffic analysis and forecasting.

The traffic growth rates as established by the DPWH for the National Capital Region were adopted as the basis for traffic projection:

**Table 7.2: DPWH Traffic Growth Rates (%) for National Capital Region**

| Year | Private transport | Public Transport | Freight Transport |
|---|---|---|---|
| 2003 – 2008 | 7.4 | 7.0 | 4.3 |
| 2009 – 2014 | 7.5 | 7.0 | 5.4 |
| 2015 – 2020 | 5.6 | 6.5 | 4.9 |
| 2021 – 2026 | 4.8 | 6.1 | 3.8 |

*Source: DPWH Project Management Office (PMO)-Feasibility Study*

The traffic forecast for Vehicle Class 1, the class with the most numerous vehicles, is presented in the following table:

**Table 7.3: NLEX East Average annual daily traffic forecast for Class 1**

| Interchanges | 2015 | 2016 | 2017 | 2018 | 2019 | 2023 | 2028 | 2033 | 2038 | 2043 |
|---|---|---|---|---|---|---|---|---|---|---|
| Bigte | | | | | | | | | | |
| Banaban | 2,313 | 2,680 | 3,104 | 3,596 | 4,166 | 4,826 | 10,066 | 15,131 | 25,778 | 38,725 |
| Gabihan | 3,190 | 3,696 | 4,281 | 4,960 | 5,745 | 6,655 | 12,497 | 19,668 | 29,584 | 45,255 |
| Pacalag | 2,874 | 3,329 | 3,856 | 4,467 | 5,175 | 5,994 | 11,131 | 17,186 | 26,626 | 38,603 |
| Sta. Rosa-Cabanatuan | 2,223 | 2,575 | 2,983 | 3,456 | 4,003 | 4,638 | 7,470 | 11,310 | 17,371 | 27,890 |
| Cabanatuan-Fort Magsayay | 2,429 | 2,814 | 3,260 | 3,777 | 4,375 | 5,068 | 12,215 | 17,299 | 17,996 | 30,276 |
| Fort Magsaysay – Palayan | 2,762 | 3,199 | 3,706 | 4,293 | 4,973 | 5,761 | 15,382 | 20,120 | 13,311 | 25,680 |
| Palayabn-Talavera | 3,712 | 4,301 | 4,982 | 5,771 | 6,685 | 7,744 | 12,423 | 16,526 | 8,041 | 19,384 |

*Source: Outline Business Case*

Based on the OBC's forecast, even though traffic would grow at 16% year-on-year until 2023, the magnitude of the traffic appears low in absolute terms to attract investor interest. After 2023, the traffic is forecasted to increase irregularly with growth rates ranging between -13% and +19%. Further research is needed to explain for irregularity.

The base traffic demand scenario is based on the following toll schedule:

- Class 1 – PHP 2.38 (USD 0.05) per kilometre
- Class 2 – PHP 5.95 (USD 0.13) per kilometre
- Class 3 – PHP 7.15 (USD 0.16) per kilometre

The above rates have increased by 30% since 2013. Therefore, the WB team recommends updating the assumptions in the model to arrive at more actual results. The rates are considered comparable to similar projects in ASEAN.

Sponsors and lenders will need to do their own due diligence to assess these traffic estimates.

## 7.3 Costs and Preliminary Assessment

The costs that have been used for calculations in the OBC are in the table below.

**Table 7.4: Project Cost Estimates**

| Cost | PHP million | USD million | % of CAPEX |
|---|---|---|---|
| General | 3,180.69 | 69 | 7.0% |
| Road | 16,651.22 | 362 | 36.6% |
| Bridge | 5,803.14 | 126 | 12.7% |
| Interchanges | 7,530.60 | 164 | 16.5% |
| Drainage and slope protection | 897.26 | 20 | 2.0% |
| Miscellaneous | 2,658.83 | 58 | 5.8% |
| Toll equipment | 1,800.00 | 39 | 4.0% |
| Design | 770.43 | 17 | 1.7% |
| State Project monitoring | 770.43 | 17 | 1.7% |
| Construction Supervision | 1,155.65 | 25 | 2.5% |
| Contingencies | 3,852.17 | 84 | 8.5% |
| Administration Cost | 450.70 | 10 | 1.0% |
| Basic Costs | 45,521.12 | 990 | 100.0% |
| Environmental Management Plan | 10.00 | 0.2 | |
| Insurance | 770.43 | 17 | |
| Right of Way | 2,814.00 | 61 | |
| **TOTAL Project Cost** | **49,115.55** | **1,068** | |

Operation and Maintenance costs have been assumed in the OBC as 20% of the gross revenue, of which about 50% will go to the salaries/wages, 20% for utilities and 30% for maintenance works.

Mott MacDonald, the technical consultant, considers several of the estimated costs to be on the high side. For CAPEX, a cost of USD 10 million per kilometre can be considered as being within a reasonable range. For OPEX, Mott MacDonald recommends reviewing the costs to find an optimal balance between CAPEX and OPEX, and should include a comprehensive routine maintenance and rehabilitation/ replacement programme.

Sponsors and lenders will need to do their own due diligence to assess these cost estimates.

## 7.4 Intended and Proposed Structure

The proposed structure for the NLEX East project is a Build-Transfer-Operate (BTO) model. Assessment for the suitability of the proposed structure is as follows:

- Since the launch of President Aquino's PPP Program, a number of PPP transport infrastructure projects (including three toll roads projects) have successfully reached financial close using a Build -Transfer- Operate (BTO) concession arrangement.
- Precedence indicates sufficient financial capacity within the local markets to finance and take risks for projects similar to those seen in this project. These risks include the private sector building the infrastructure assets on a turn-key basis, taking on cost and time overruns and specified performance risks.
- The government prefers to secure the legal ownership of the asset at an early stage.
- Currently, there is no clarity in Department of Finance on the budget and regulations for output or performance based payment structure contracts, therefore concessions PPP are preferred to availability based PPPs.
- In case there is insufficient forecast demand to make NLEX East project financially viable, viability gap funding[9] could be provided up to max of 50% of project cost.

Different from the CLLEX project, however, traffic risk for this project might be perceived differently by the private sector. While demand for road infrastructure in the Metro Manila and surrounding areas remains strong, this demand becomes weaker as routes get further from the economic centre of the country. As NLEX East's forecast demand is rather on the low side and traffic ramp up during the first years of operation is slow, and the project may face competition from the planned CLLEX project, investors may require government guarantees for minimum revenue or even availability payments to participate.

Moreover, international commercial funding may be needed for this project given its size vis-à-vis the capacity of local financing. To lower the cost of international commercial funding, the government could consider working with multilateral organisations to mitigate the risk of non-honouring of sovereign obligations. This will also bring down the overall size of government support needed.

[9] Such funding provided by the government are called subsidies in the Philippines, and are provided under the Strategic Support Fund. To tap on this fund, the project has to be solicited by the government, and competitively procured in a transparent manner.

## 7.5 Any Technical Issues

The technical consultant assesses that no exceptional technical issues are currently encountered that a competent and experienced designer, contractor and operator will not be able to manage and overcome.

## 7.6 Other Relevant Issues

The level of studies seems sufficient for the Outline Business Case stage, but more detailed studies will have to be carried out by investors for subsequent stages.

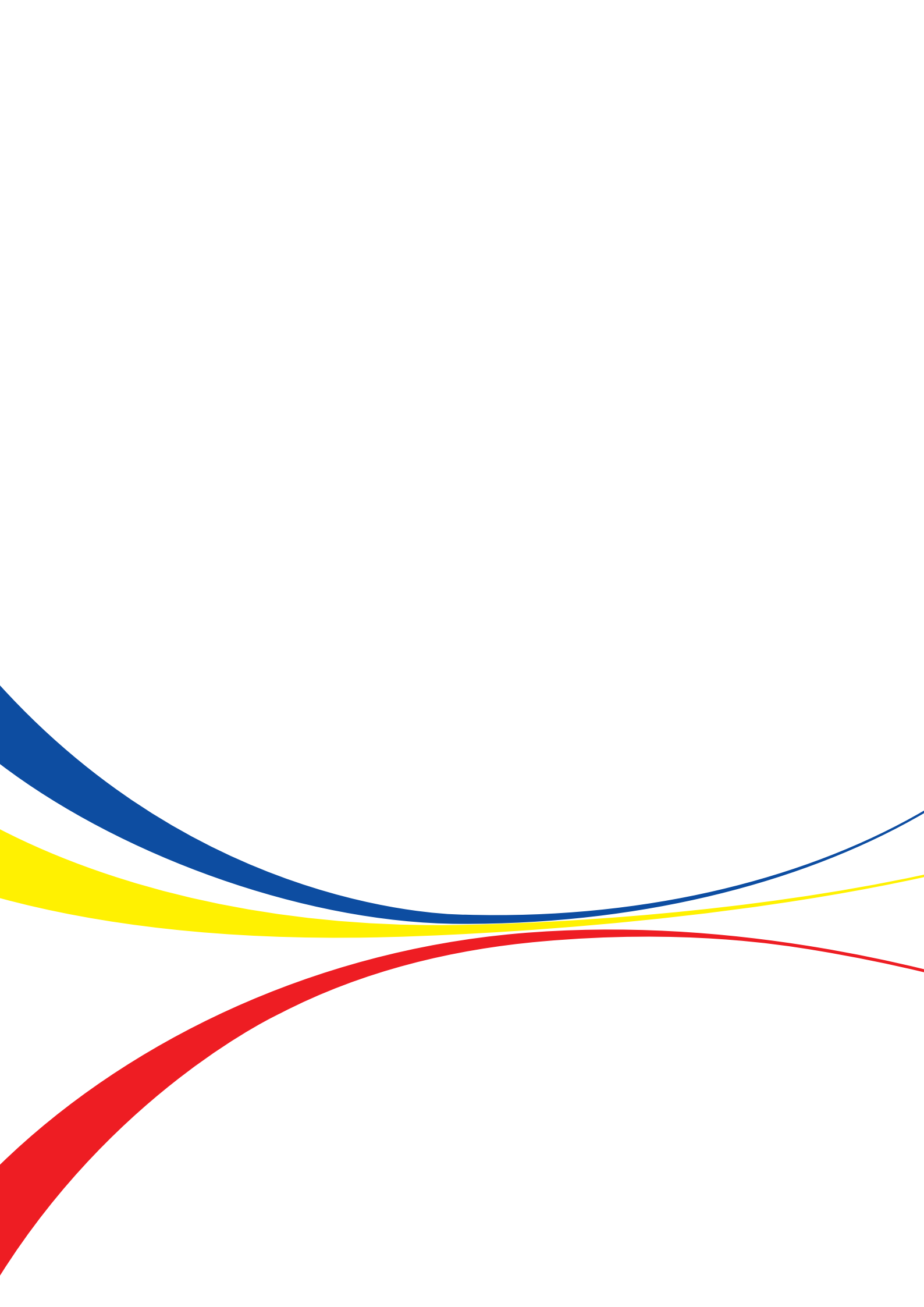
## 7.7 Further Actions Needed

The following table lists the actions that need to be taken for the project to progress as a PPP:

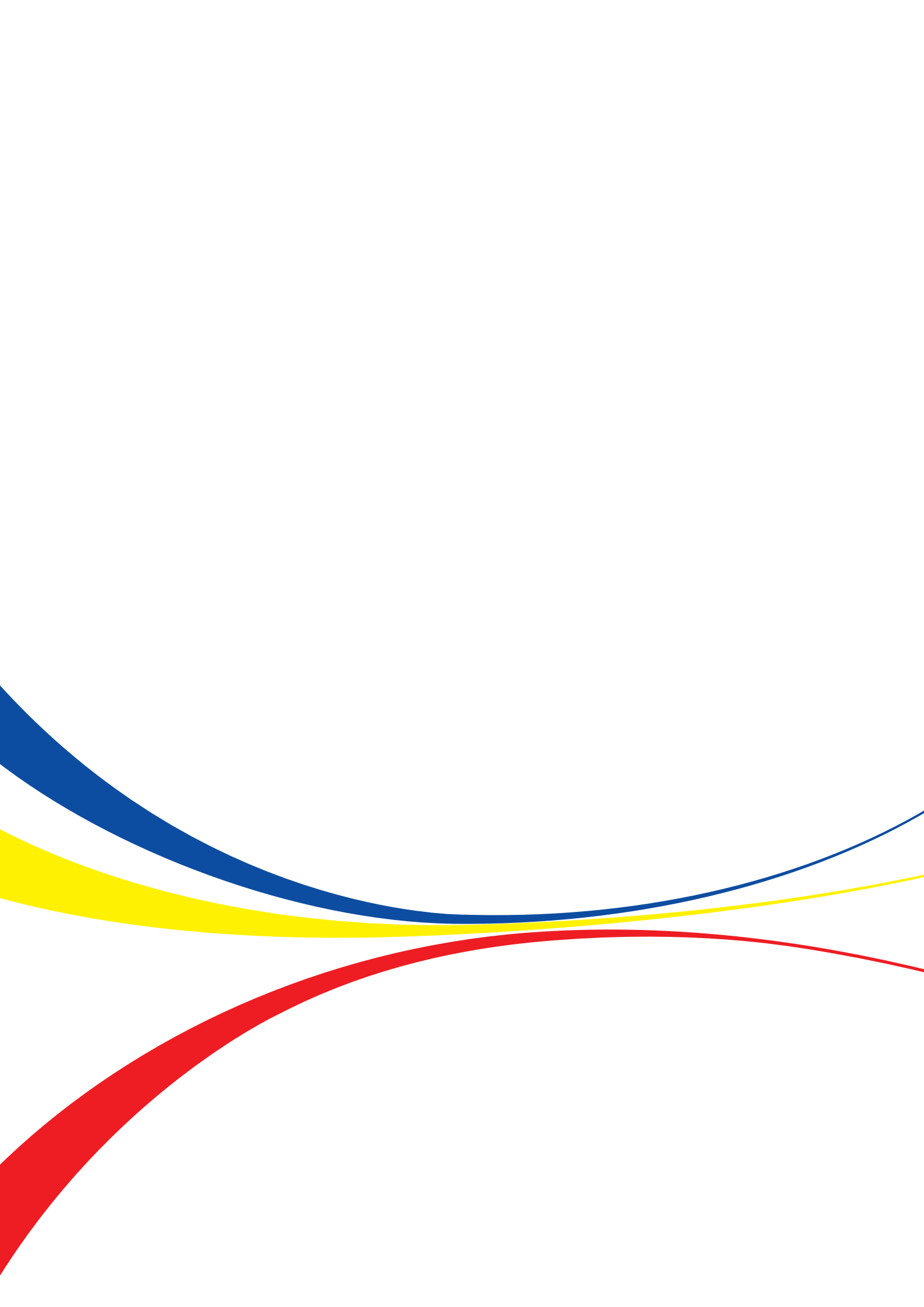
**Table 7.5: List of actions to take for PPP**

| Potential Issue | Responsibility and recommended action | Timeframe |
|---|---|---|
| Completion of Feasibility Study and submission to NEDA / ICC | DPWH | Q3 2015 |
| Internal assessment:<br>Value for money<br>Financial bankability<br>Environmental<br>Social & Economic | PPP Center<br>DOF<br>DENR<br>NEDA | Q4 2015 |
| Final approval by ICC-Cabinet Committee and NEDA Board | ICC / NEDA | Before the bid phase |
| ROW acquisition | DPWH | Within 2 years / before construction |
| Tender process | DPWH with assistance of PPP Center / international transaction advisor | |

*Source: Mott MacDonald's analysis*



# 8. TRANS-SUMATRA TOLL ROAD: KAYU AGUNG - PALEMBANG - BETUNG (INDONESIA)



# 8. TRANS-SUMATRA TOLL ROAD: KAYU AGUNG - PALEMBANG - BETUNG (INDONESIA)

## Project Summary


*Figure 1: Project Location in South Sumatra, Indonesia*

| **Project Details** | | |
|---|---|---|
| **Project Cost** | **Duration** | **Project Implementing Agency** |
| Ministry of Public Works estimates:<br>Construction cost: IDR 12.65 trillion<br>Land acquisition cost IDR 0.5 trillion | 50 years, including construction | Indonesia Toll Road Authority, under the Directorate General of Highways (Bina Marga), Ministry of Public Works (MoPW) |
| **Summary of Project** | | |
| Design, construction, operation and maintenance, including finance of 111.69 km segment of Trans-Sumatra Toll Road: Kayu Agung – Palembang – Betung. | | |
| Intended Procurement Method | • The project is an unsolicited BOT proposal from a group of private investors[10].<br>• Tender pre-qualification started in March 2015, and is expected to be closed by June 2015. As of November 2015 the status of the project is unclear.<br>• The original private investor has a right to match. According to MoPW it is sufficient to have only 1 bidder for the project to go forward. | |

[10] Based on further conversations with the BPJT, it is understood that the majority of the Trans-Sumatra toll road would be allocated to State-Owned Enterprise PT HutamaKarya for development. However, this segment of the road (Kayu Agung – Palembang – Betung) will still be undertaken by the private sector.

| Project Details (cont.) | |
|---|---|
| **Project Background** | |
| Relevance to country and ASEAN connectivity | • The project aims to boost intra-island connectivity between major economic centres in Sumatra, Indonesia's second most populous island, and provide seamless integration with Java. Palembang is Sumatra's second largest city.<br>• The proposed toll road segment is planned to significantly lower logistics costs of inland industries and mining activities. Existing arterial road is reported to be inefficient and congested. |
| Scope of Toll Road | The toll road is planned to be part of Trans-Sumatra Toll Road. It comprises the following main Sections:<br>Section 1 (33.5km): Kayu Agung - Jakabaring (Palembang)<br>Section 2 (33.9km): Jakabaring (Palembang) - Musi Landas<br>Section 3 (44.3km): Musi Landas - Betung |
| **World Bank Analysis** | |
| Proposed Structure | • This project is unsolicited and the government is open to going ahead with a single bidder.<br>• Since this is an unsolicited project, VGF funding from the government will not be available. This could have implications on project viability if traffic for the intended road is not high enough, especially in the early years of the project. |
| Further considerations | • While land acquisition is usually considered a major risk for road projects in Indonesia, the private investor, through their familiarity with the region, seems to be comfortable taking on this risk.<br>• Should government support become necessary, a guarantee from the Indonesia Infrastructure Guarantee Fund can be considered. Another possibility is to partner with a State-Owned Enterprise (SOE), e.g. in a Business-to-Business model. |

## Full Project Report

### 8.1 Project Scope


*Figure 2: Diagram of intended Trans Sumatra toll road project*

The following table summarises some key technical characteristics of the project.

| Table 8.1: Project Technical Characteristics | |
|---|---|
| **Parameters** | **Value** |
| Length | 111.69 km |
| Lane set up | 2 x 2 lanes plus hard shoulder |
| Road Width/ lane | 3.60 m |
| Outer Shoulder | 3.00 m |
| Inner Shoulder | 1.50 m |
| Median (including inner shoulder) | 5.50 m |
| Design Speed | 100 km/h |
| Structures | 25 |
| Interchanges | 10 |
| Concession Duration | 50 years |

*Source: Ministry of Public Works*

## 8.2 Traffic Projections and Preliminary Assessment

Palembang is the second largest city on the Sumatra Island (after Medan). The population of the city has been growing at an average annual growth of 4%. The year 2013 estimate was 1,742,186 people, up from 1,417,047 in 2008. A change in land use from agriculture to urban in this region is following country and global trends. Therefore, more economic activity such as trade and services, is associated with the same areas, growing the pressure on the transport infrastructure. The following table gives the traffic forecasts based on the feasibility study that the WB team was provided with for this analysis.

**Table 8.2 : Project Forecast Traffic Volumes**

| Section | 2016 | 2017 | 2018 | 2019 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SEGMEN I KAYU AGUNG-SS JAKA BARING | 7,501 | 8,401 | 9,577 | 11,014 | 12,666 | 27,295 | 52,089 | 88,556 | 134,993 | 187,549 | 243,946 |
| SEGMEN II SS JAKA BARING-SS MUSI LANDAS | 14,816 | 16,594 | 18,917 | 21,755 | 25,018 | 53,914 | 102,888 | 171,768 | 245,353 | 245,353 | 245,353 |
| SEGMEN III SS MUSI LANDAS-BETUNG | 10,718 | 12,005 | 13,685 | 15,738 | 18,099 | 39,002 | 74,431 | 124,261 | 180,873 | 237,504 | 242,254 |
| *Implied growth per annum* | | *12%* | *14%* | *15%* | *15%* | *17%* | *14%* | *11%* | *8%* | *6%* | *0%* |

*Source: Feasibility Study*

The feasibility study estimates the value of time for the project based on a calculation by Jasa Marga in 1989. This assumption is considered to be of limited value as presumably the underlying basics have significantly changed in the past 25 years. Also, it is not clear if regional differences have been taken into account. Thus, the assumed value of IDR 664 per kilometre might be appropriate for a toll road in Jakarta but on the high side in Palembang. Values below IDR 500 per kilometre would be considered more typical. However, a comprehensive, up to date analysis should be carried out. For example, higher tolls might reduce the traffic demand but the revenue might be higher. Consequently, revenue forecasts based on such assumptions are likely neither robust nor reliable.

Additionally, the traffic growth in the early years is considered to be on the optimistic side. Such growth rates have been observed in similar projects in Indonesia, however, at more economically active areas.

Lastly, the high level drawing seems to imply that a number of local alternatives are available for local traffic to avoid the toll road. As Palembang is the second largest city in Sumatra, high volume of through traffic is not expected.The traffic forecasts exceed the capacity of a 2X2 lane road and are therefore not achievable. The traffic forecast (over 200,000 vehicles per day)

presented in the feasibility study cannot be physically achieved as the predicted volumes will exceed road carrying capacity. Without considering any local traffic profiles by hour of day or day of week, a typical realistic capacity is of the order of 25,000 vehicles per day per lane. For a road with 2 lanes in each direction, this would give 100,000 vehicles per day. With 3 lanes in each direction this could increase to 150,000 vehicles per day. Therefore, the WB team is sceptical of the traffic projections provided in the study.

Considering the low traffic volumes on the one side and high willingness to pay assumption on the other side, there is some uncertainty as to whether resulting revenue calculation is robust. A more in depth traffic study to be carried out by an independent consultant to have bankable numbers is needed. However, due to the project being an unsolicited bid from a private investor consortium is evidence that at least one party in the private sector is willing to take on the demand risk.

Lenders and sponsors will need to do their own traffic and revenue estimates for the project.

## 8.3 Costs and Preliminary Assessment

The following table presents cost estimates as given in the feasibility study, adjusted to real 2015 IDR/USD. The total estimated project investment cost (including the cost of financing and land acquisition) is US$ 1.1 billion. If the cost of financing, taxes and ROW acquisition costs are excluded, the total project cost comes to US$ 926 million.

**Table 8.3: Estimated Project Cost (Construction)**

| Item | million IDR (2013 prices) | million USD* (2015 prices) | Implied percentage share |
|---|---|---|---|
| Engineering Design | 80,549 | 7 | 0.7% |
| Construction | 8,054,921 | 687 | 74.2% |
| Toll Equipment | 100,284 | 9 | 0.9% |
| Construction supervision | 100,687 | 9 | 0.9% |
| Escalation | 1,879,107 | 160 | 17.3% |
| Contingency | 402,746 | 34 | 3.7% |
| Overhead | 241,648 | 21 | 2.2% |
| ***Sub-Total (excl. taxes, ROW, cost of financing)*** | ***10,859,942*** | ***926*** | ***100%*** |
| VAT (10%) | 1,061,829 | 91 | |
| ROW | 410,000 | 35 | |
| Financial Cost | 107,903 | 9 | |
| IDC | 858,202 | 73 | |
| **TOTAL** | **13,297,876.00** | **1,134** | |

*Source: Feasibility Study*

** Cost in USD have been estimated applaying inflation up to 2015 and prevailing IDR to USD exchange rate in 3rd quarter 2015.*

However, a few changes to the cost estimates were made resulting from Mott MacDonald's assessment. The project scope assumes widening the road from 4 to 6 lanes (i.e. adding 1 more lane in each direction), once additional capacity is needed in order to accommodate forecasted traffic. It is typical best practice to start the widening works once the volume/capacity ratio reaches around 80%. Based on the available traffic forecast, the technical advisor identified the years at which the capacity of Sections 1, 2 and 3 are reached: for an 80% capacity, this was the 15th year of operation (2036), 9th year of operation (2030) and 12$^{th}$ year of operation (2033), respectively. The Feasibility Study did not make any allowance for the construction cost of widening works. Mott MacDonald assumed 16% of original capex, provided all necessary space for widening has been provided during initial construction and no major earthwork is required.

The resulting cost assumptions, taking into account a staggered construction schedule, are presented below:

**Table 8.4: Overall Project Cost Assumptions**

| Cost | IDR million (2015 prices) |
|---|---|
| Capex (total) | 13,170,357 |
| Capex of widening Section 1 from 4 to 6 lanes | 615,238 |
| Capex of widening Section 2 from 4 to 6 lanes | 761,234 |
| Capex of widening Section 3 from 4 to 6 lanes | 648,129 |
| Operation and Routine Maintenance per year | 2% of capex |
| Periodic Maintenance, every 5 years | 5% of capex |

*Source: Feasibility study and Mott MacDonald's analysis*

On a cost per kilometre basis, the WB team assessed the value of the Capex to be on the high side compared with similar projects in Indonesia.

Lenders and sponsors will need to do their own due diligence when assessing the project.

## 8.4 Intended and Proposed Structure

Kayu Agung – Palembang – Betung toll road project is an unsolicited proposal to MoPW from a group of local investors as a BOT model.

BPJT will contract private sector to finance, design and construct and operate and maintain the road. The ownership of the expressway will be transferred to the BPJT at the end of PPP contract. The duration of PPP contract as envisaged by private sector is 50 years including construction. Although the government would be responsible for timely land acquisition and resettlement, the private sector will eventually have to reimburse the associated cost since this is an unsolicited proposal.

As the project is an unsolicited proposal, it is not eligible for government support in the form of VGF (direct subsidies). However, government guarantees can be provided, provided there is

interest from the Indonesia Infrastructure Guarantee Fund (IIGF)[11]. If provided, the guarantees could cover:

- Costs borne by the private sector resulting from unforeseen land acquisition delays;
- Failure by the government to enact tariff escalation on time; and,
- Termination payments to the private sector for partly or wholly-created assets.

If the Ministry allows, another possibility is for the private sector to partner with a State-Owned Enterprise (SOE), e.g. in a Business-to-Business model. This would allow the project to be supported via equity support to the SOE.

## 8.5 Any Technical Issues

The technical consultant assesses that there are no exceptional technical issues currently encountered considering the terrain, alignment and structures that a competent and experienced designer, contractor and operator would not be able to manage and overcome.

## 8.6 Other Relevant Issues

More robust revenue and cost estimates are needed to increase the reliability of assessments.

## 8.7 Further Action Needed

The following table shows the summary of issues that need to be addressed for it to progress as a PPP:

**Table 8.5: List of actions to take for PPP**

| Potential Issue | Responsibility and recommended action | Timeframe |
|---|---|---|
| More in-depth traffic forecast studies has to be prepared | Private Investor | Before the bid submission. |
| AMDAL[12] | MoPW / private investor | Before the project award |
| Location permits (SP2LP) to be obtained for the remaining 90% of the road so that actual land acquisition implementation could start | MoPW, local provincial government | Before the project award |
| Land acquisition implementation | Local provincial government and BPN | Before the project award |
| Final Business Case needs to be completed | MoPW / private investor | Before the project award |
| Approval of final business case needs to be obtained | MOF | Before the project award |

*Source: Mott MacDonald's analysis*

[11] IIGF is a state-owned company and provides guarantees for the financial obligations of the government contracting agency (GCA) under a concession agreement (CA) or PPP Contract to mitigate government-related contractual risks.
[12] Environmental Impact Assessment Environmental Impact Assessment.

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