

ENHANCING ASEAN CONNECTIVITY

INITIAL PIPELINE OF ASEAN INFRASTRUCTURE PROJECTS

APPROACH & CONTEXT

“ TO ACHIEVE A SEAMLESSLY AND COMPREHENSIVELY CONNECTED AND INTEGRATED ASEAN THAT WILL PROMOTE COMPETITIVENESS, INCLUSIVENESS AND A GREATER SENSE OF COMMUNITY.”

Vision statement from the Master Plan on ASEAN Connectivity 2025

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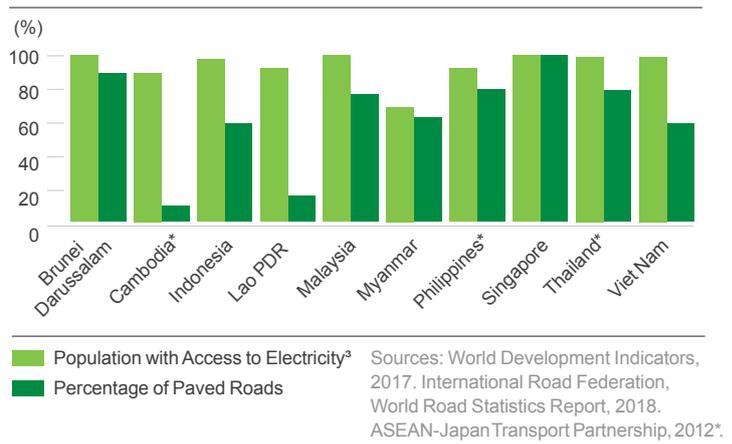
The contents and recommendations in this summary report have been prepared by the International Bank for Reconstruction and Development (the "World Bank") for the Association of Southeast Asian Nations ("ASEAN") in connection with the identification and establishment of a rolling pipeline of potential infrastructure projects to improve connectivity within ASEAN (the "Initial Pipeline"). Except where expressly stated, the views expressed in this publication are those of the author(s) and do not necessarily reflect the views of the World Bank's Board of Executive Directors, or those of the governments they represent. This document has been prepared by the World Bank based on Project Application Forms submitted by the ASEAN Member States, as well as other information provided by the ASEAN Member States in support of those applications, all prior to the date of this document. The World Bank has not independently verified or audited information on which this document is based. None of the World Bank, any of its member states or representatives, or any ASEAN Member State, makes any warranty or representation, expressed or implied, concerning the relevance, accuracy or completeness of either the information or the analyses of information contained in this document or any other written, oral or other information made available to any recipient or its representatives in connection therewith. Furthermore, no responsibility or liability of any kind will be accepted by any of the aforementioned parties, who expressly disclaim any and all liabilities which may be based on, or may derive from, this document or such other information made available in connection therewith, or for any inaccuracies, omissions or misstatements therein. Any changes in the information on which this document is based may result in changes to the analysis and recommendations set forth in this document. Given that many of the projects submitted by the ASEAN Member States are in the initial stages of development and have limited data (particularly on the environmental and social impacts of the project), the selection of a project for inclusion in the Initial Pipeline should not be construed as a commitment to provide financing or an endorsement by the World Bank of the project, its alignment, procurement process, or eventual choice of bidder. Receipt of this document or the information it contains will not constitute, nor should it be relied upon as, the giving of financial, investment, legal or tax advice.

The World Bank's role in these projects has been limited to participating in identifying the Initial Pipeline and preparing these project briefs and related materials. This role should not be construed as an assurance that the World Bank may be involved in the further development, financing, implementation, supervision or procurement of these projects.

BACKGROUND



Figure 1. Measure of ASEAN Infrastructure Access



THE ASSOCIATION OF SOUTHEAST ASIAN NATIONS (ASEAN) COMPRISES SOME OF THE WORLD’S FASTEST-GROWING COUNTRIES, DRIVEN BY A GLOBAL SHIFT IN ECONOMIC BALANCE TOWARD ASIA, AS PRODUCTIVITY AND TRADE IN THE REGION CONTINUE TO GROW.

Infrastructure development and connectivity must keep pace with such growth for the region to reach its full potential.

Enhanced connectivity promotes growth and productivity, and increases access to markets and opportunities to participate in global value chains.¹ In addition to economic impacts, the development of robust networks connecting economic centers enhances the resilience and reliability of trade and industry systems at a time when there are increasing instances of extreme climate-related events and geopolitical uncertainties. Well-designed connectivity networks can also enhance sociocultural integration among ASEAN Member States, strengthen regional identity, and support community building.

However, due to budget constraints and competing demands for resources, many ASEAN governments do not have sufficient resources to invest in the amount of physical infrastructure needed. The ASEAN region’s annual infrastructure needs exceed USD 110 billion a year, which is between two to six times more than the annual amount that the ASEAN Member States have historically spent.² As a result, the quality of and access to infrastructure services across and between ASEAN Member States varies. For example, Figure 1 measures access to electricity and percentage of paved roads across ASEAN and reflects the fact that significant infrastructure gaps still exist across ASEAN. Such gaps are currently constraining economic growth and productivity, poverty reduction, and resilience in several of the ASEAN Member States.

1. Global Infrastructure Connectivity Alliance, Why Connectivity Matters, www.gica.global

2. MPAC 2025, https://asean.org/storage/2016/09/Master-Plan-on-ASEAN-Connectivity-20251.pdf

3. Electricity access data is indicative of grid access.

TRANSLATING MPAC 2025 FROM STRATEGY TO INITIATIVE: AN INITIAL PIPELINE OF ASEAN INFRASTRUCTURE PROJECTS

METHODOLOGY FOR SELECTION OF INITIAL PIPELINE PROJECTS

To promote infrastructure investment in the region, the Master Plan on ASEAN Connectivity 2025 (MPAC 2025) envisaged the establishment of a rolling priority pipeline list of potential ASEAN infrastructure projects and sources of funds. With the technical assistance of the World Bank and support of the ASEAN-Australia Development Cooperation Program Phase II (AADCP II), ASEAN has developed an "Initial Pipeline of ASEAN Infrastructure Projects" (Initial Pipeline) across the transport, energy, and information sectors. The Initial Pipeline is intended to be a list of physical infrastructure projects that has the potential to enhance the movement of people, services, goods, and innovations within ASEAN and contribute to ASEAN's objectives of improving access and increasing connectivity in and among the ASEAN Member States.

The pipeline will be rolling, meaning that projects in the Initial Pipeline will evolve over time, as new project proposals are submitted, and existing projects in the Initial Pipeline are either implemented or removed from the Initial Pipeline due to lack of progress or change in circumstances. In this way, the pipeline is designed to be a long-term dynamic tool to help the ASEAN Member States assess and prioritize infrastructure projects that will have regional impacts.

Projects were submitted by ASEAN Member States based on their own national priorities.

Once the projects were submitted by the ASEAN Member States using a standardized template, they were then assessed based on a set of screening and scoring criteria (see Table 1 & Table 2) to determine the suitability of the projects for inclusion in the Initial Pipeline. The criteria are in line with international best practices and are based on several key factors, including the project's strategic relevance, its impact on regional connectivity, environmental and social (E&S) impact, project feasibility, and the contracting agency's implementation capacity.



Screening Criteria

Before the submitted projects were scored, each project was screened to determine whether it was suitable for consideration for inclusion in the Initial Pipeline. The projects that passed the screening phase were then scored based on the scoring criteria which was designed to ensure a consistent and transparent assessment of the suitability of projects being proposed for inclusion in the Initial Pipeline.

Scoring Criteria

Each project was scored against 30 individual criteria, which measure a project’s strengths and weaknesses across five main categories as shown in the first column in Table 2. Weighting is determined by the number of criteria under each section and the number of points assigned to each criterion. Where data was limited, effort was made to gather additional information from the relevant ministries and from sector experts and benchmark data.

Table 1. Screening Criteria

Summary Criteria
Eligible infrastructure sector
Pre-procurement stage of development
Enhances regional connectivity
Official priority of at least one ASEAN Member State
Sufficient information to adequately assess the project
Commitment to apply safeguards when project is developed

Table 2. Summary of the Scoring Schedule

Category	Summary Description	No. of Criteria	Maximum Score	%
Strategic Relevance and Regional Connectivity	Assesses the strategic relevance of the project, the level of support and the extent to which the project will have regional impact across ASEAN.	6	42	20
Need and Economic and Social Benefits	Assesses the need for a project and its economic and social benefits.	5	54	25
E&S Impact	Assesses the E&S impacts of the project, the extent to which these impacts can be mitigated, and the amount of land that needs to be acquired.	9	66	30
Financial Viability	Assesses the extent to which the project is affordable to the government and/or end users, the level of interest shown by any potential funders/ investors, and whether it is the intention of the contracting agency to competitively procure the project.	7	40	19
Implementation Risks	Assesses the enabling environment and ability of the contracting agency to implement the project.	3	12	6
		30	214	100

The Importance of Measuring Environmental & Social Impacts

Submitted projects were screened and assessed, based on available project related information, to determine the potential E&S risks and impacts of the project and provide preliminary recommendations on next steps.

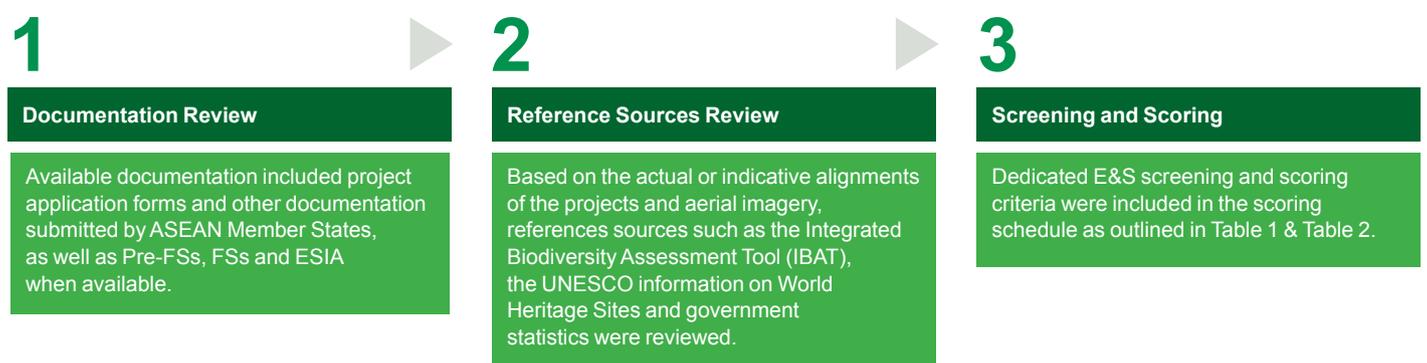
The assessment was guided by the World Bank's Environment and Social Framework (ESF). The E&S review approach included three steps, see Figure 2.

It is important that E&S considerations are fully integrated into the development process in a robust manner, including applying the mitigation hierarchy throughout the lifecycle, particularly at the feasibility and design stages where there is the most potential for positive outcomes, for example through avoidance of areas of high biodiversity value. Given that many of the projects have limited, or no, E&S assessment to-date, it is important that the assessment of E&S impacts is prioritised for projects and the results of the assessment are fully reflected in the project design, alignment and execution.

For each project, the aim should be to ensure that a comprehensive Environmental and Social Impact Assessment (ESIA) is conducted as soon as possible (with prioritisation of some studies, where required) and is integrated into any ongoing feasibility and alignment selection studies. As part of the impact assessment process, projects should engage stakeholders through enhanced consultation, participation, and accountability. The results from the ESIA and consultations should then inform the original project concept and may necessitate significant changes to its design and alignment to take into account the feedback and results of studies. These results from assessments and consultations should also feed into the development of an Environmental and Social Management Plan (ESMP) that considers relevant phases, e.g. construction and operations. The ESMP should be implemented from project development through operation with the allocation of resources and budget, including flow-down to contractors of relevant ESMP obligations with monitoring and reporting on its implementation.

Together with a robust approach to the assessment of E&S risks and impacts on a project-by-project basis, the relevant direct, indirect, and cumulative E&S risks and impacts should also be assessed in an integrated manner, including taking into account associated facilities. A Strategic Environmental Assessment (SEA) or Regional Impact Assessment (RIA) could be considered in addition to the ESIA.

Figure 2. The E&S Review Approach Steps



Key Policy Considerations for Infrastructure Connectivity Projects

There are a number of key policy considerations for ASEAN and the ASEAN Member States when planning, assessing and developing infrastructure projects to ensure their success and sustainability.

1. Ensure fiscal sustainability

Large infrastructure investments often have significant financial trade-offs. On the one hand, infrastructure corridors have great potential as a development tool, but on the other, they are typically very costly, not only in terms of their direct outlays, but also in terms of other forgone development opportunities. Because they require large funding (and often large borrowing) up front, infrastructure corridor investments can potentially jeopardize fiscal sustainability and macroeconomic stability. Even projects with private financing often generate contingent liabilities for the government. In addition, governments often do not adequately budget for the ongoing costs of operating and maintaining an asset once it has been built. Therefore, ensuring debt sustainability is critical, and within ASEAN, large infrastructure projects should only be undertaken if it can be demonstrated that such projects are affordable to the government and/or end users.

2. Mitigate infrastructure redundancy

It is important to weigh the advantages and disadvantages between different modalities of transport and consider the risk of infrastructure redundancies. For example, highways are typically less costly to build and maintain than railways and have the advantage of allowing more connectivity and access along their routes, compared with railways, which have fixed access points (i.e. stations) along their route. On the other hand, rail routes can move much higher volumes of freight and passengers with lower environmental impacts.

At the same time, given budget constraints, the ASEAN Member States must be wary of creating infrastructure redundancies, such as building two roads along the same corridor, or two ports that are close to one another. Furthermore, it is important to take into account the changing pace of technology when assessing projects and estimating future demand. In this context, governments can be supported in their decision-making processes by undertaking well-prepared feasibility studies with robust options analyses to help determine which is the best option to serve a particular infrastructure 'need.'

3. Assess benefits across different development objectives

There is often a need to consider different development objectives. ASEAN is a diverse region, with countries of varying income levels and, as such, it will be important to ensure that any exercise in regional planning takes into account the differing development objectives of all of the countries involved and prioritizes the lower-income countries, so they can 'catch up' to the rest. In addition, certain corridor investments may benefit some people more than others, and the failure to identify the relative and absolute 'winners and losers' and to support them as needed could become counter-productive. Various policies and institutional reforms ('soft' interventions) can be used to ensure that the benefits of a project are more widely shared. The most promising complementary interventions are upgrading skills, strengthening public sector governance, and upgrading land administration systems around the corridors.

4. Appraise with robust data and methodology

It is important to appraise the potential of a project or to prioritize a list of projects using robust data and reliable methodologies. Spatial data can be used to assess linkages and determine potential social and environmental impacts. Scenario planning and development suitability assessments can be used to evaluate transnational and transregional connectivity and efficiency and compare options. An input-output economic model can be used to identify economic impact, and demand modeling can help support an analysis of potential revenue generated to support further financial analysis. Taking a systematic national and transnational approach to infrastructure assessment helps link sectors and allows a "whole of infrastructure" approach that takes into account the impact of competing and complementary infrastructure investment.

5. Adopt infrastructure convergence

When planning for infrastructure provision, it is important to consider converging several infrastructure services into one project, to the extent that it is feasible and economically viable to do so. For example, when building a new road, studies should be undertaken to ascertain the feasibility and viability of designing the road to allow for pipes to be laid, which would allow internet and power cables to be installed. Alternatively, when building a power transmission line, it may make sense to also design the towers to allow for internet cables. In this way, the economic and social impacts of a project can be enhanced.

INITIAL AND POTENTIAL PIPELINE PROJECTS

A total of 42 applications were submitted by eight ASEAN Member States. 40⁴ applications were confirmed to have satisfied the initial screening criteria, of which the majority are road projects (17), followed by railways (10), power interconnections and transmission lines (5), bridges (3), ports (2), airports (2), and ICT networks (1).

From the list of projects that passed the screening test, two pipelines of infrastructure projects have been developed:

- Initial Pipeline: Consists of projects that have satisfied a set of screening and scoring criteria including strategic relevance, impact on regional connectivity, environmental and social impact, project feasibility, and contracting agencies' implementation capacity. If certain pre-conditions are met, these projects are expected to attract investments and potentially contribute to improving the movement of people, services, goods and innovations among the ASEAN Member States.
- Potential Pipeline: Consists of projects where the economic cases are currently not as robust and/or risks appear to be substantial or are not yet determined. As such, further studies will be necessary to substantiate the viability of these projects before implementation.

Based on the results of the scoring and an assessment of each project, 19 projects were selected for the Initial Pipeline.

The remaining 21 projects have been allocated to the Potential Pipeline.

4. The 40 applications represent 37 projects as three projects, the Lao PDR - Viet Nam Interconnector (South), Lao PDR - Myanmar Interconnector and the Vientiane - Vung Ang Railway, were submitted by two countries in separate applications

INITIAL PIPELINE PROJECTS

Estimated Total Investment (2019) 14.97 Billion (USD)



01

BRUNEI DARUSSALAM

Jalan Rasau Road Upgrading



Type
Brownfield



Sector
Road



Estimated Cost (USD)
44 Million

02



CAMBODIA

Siem Reap to Ratanakiri Road Upgrading



Type
Brownfield



Sector
Road



Estimated Cost (USD)
463 Million

03



INDONESIA

Kuala Tanjung International Hub Port and Industrial Estates - Phase II



Type
Brownfield



Sector
Port



Estimated Cost (USD)
265 Million

04



INDONESIA

Expansion of Hang Nadim International Airport



Type
Brownfield



Sector
Airport



Estimated Cost (USD)
421 Million

05



INDONESIA

Development of Kijing Port



Type
Greenfield



Sector
Port



Estimated Cost (USD)
400 Million

06



LAO PDR

Lao PDR National Road No. 2 Upgrading



Type
Brownfield



Sector
Road



Estimated Cost (USD)
272 Million

07



LAO PDR

Lao PDR National Road No. 8 Upgrading



Type
Brownfield



Sector
Road



Estimated Cost (USD)
207 Million

INITIAL PIPELINE PROJECTS (Continued)



08

LAO PDR

Lao PDR - Viet Nam Power Interconnector



Type
Greenfield



Sector
Energy



Estimated Cost (USD)
50- 130 Million



09

LAO PDR

Lao PDR - Myanmar Power Interconnector (Lao PDR section)



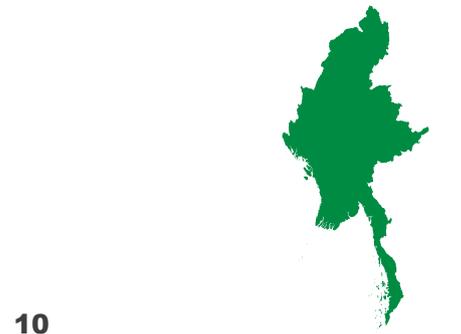
Type
Greenfield



Sector
Energy



Estimated Cost (USD)
16.5 Million



10

MYANMAR

Myanmar - Lao PDR Power Interconnector (Myanmar section)



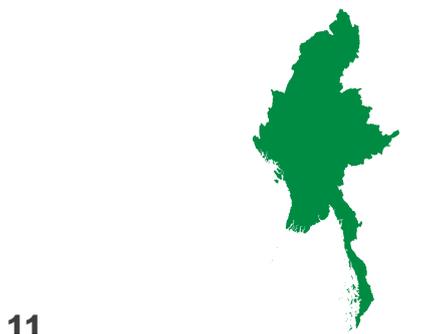
Type
Greenfield



Sector
Energy



Estimated Cost (USD)
50 Million



11

MYANMAR

Nay Pyi Taw - Kyaukpyu Expressway



Type
Greenfield/Brownfield



Sector
Road



Estimated Cost (USD)
540 Million



12

MYANMAR

Muse - Tigyaing - Mandalay Expressway



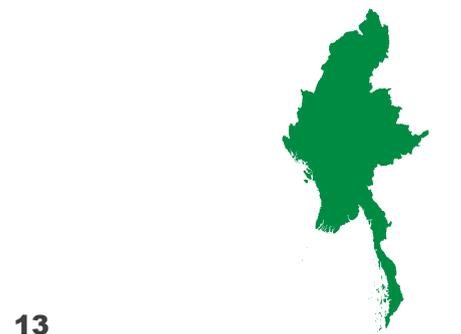
Type
Greenfield



Sector
Road



Estimated Cost (USD)
868 Million



13

MYANMAR

Yangon - Mandalay Expressway



Type
Brownfield



Sector
Road



Estimated Cost (USD)
935 Million

It is important to note that many of the 19 projects in the Initial Pipeline are in the early stages of development, and further studies may be needed to determine or verify their underlying economic robustness and identify the risks before a decision is taken to implement these projects.

While the 19 projects selected for the Initial Pipeline are expected to help enhance connectivity, these projects form only a part of the infrastructure 'connectivity' building blocks necessary to support the ASEAN connectivity agenda.

A high-level overview of each of the projects in the Initial Pipeline is available in the accompanying report: *Initial Pipeline of ASEAN Infrastructure Projects: Project Briefs*



14
MYANMAR

Tarlay - Kyainglat Road Upgrading

Type  **Brownfield** Sector  **Road**

 Estimated Cost (USD)
71 Million



15
THAILAND

ASEAN Digital Hub

Type  **Greenfield** Sector  **ICT**

 Estimated Cost (USD)
152 Million



16
THAILAND

Hat Yai-Sadao Motorway

Type  **Greenfield** Sector  **Road**

 Estimated Cost (USD)
1,295 Million



17
THAILAND

Bangkok-Nong Khai HSR - Phase II

Type  **Greenfield** Sector  **Rail**

 Estimated Cost (USD)
7,930 Million

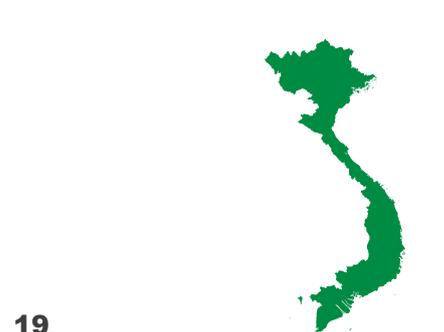


18
VIET NAM

Southern Coastal Corridor Project - Phase II

Type  **Greenfield** Sector  **Road**

 Estimated Cost (USD)
346 Million



19
VIET NAM

Ho Chi Minh City - Moc Bai Expressway

Type  **Greenfield** Sector  **Road**

 Estimated Cost (USD)
570 Million

POTENTIAL PIPELINE PROJECTS

Estimated Total Investment (USD)

20.874 Billion

Project Name	Country	Sector	Type	Cost*
Tunnel to Brunei Temburong Bridge	Brunei	Bridge	Greenfield	219
Jalan Labu Road Upgrading	Brunei	Road	Brownfield	22
Phnom Penh - Bavet Railway	Cambodia	Railway	Greenfield	865
H.A.S. Hanandjoedin Airport	Indonesia	Airport	Brownfield	27
Trans-Sumatera Railway: Jambi - Betung - Palembang	Indonesia	Railway	Greenfield	500
Trans-Sumatera Toll Road: Kuala Tanjung - Tebing Tinggi - Parapat	Indonesia	Road	Greenfield	63
Trans-Sumatera Toll Road: Palembang - Tanjung Api - Api	Indonesia	Road	Greenfield	676
Vientiane - Mu Gia Railway	Lao PDR	Rail	Greenfield	3,457
Mu Gia - Vung Ang Railway	Viet Nam	Rail	Greenfield	1,587
Thakhek - Savannakhet - Pakse - Vang Tao Railway	Lao PDR	Railway	Greenfield	2,306
National Road No. 18A Upgrading	Lao PDR	Road	Brownfield	76
Lao PDR - Viet Nam Power Interconnector (North)	Lao PDR	Power	Greenfield	400
Viet Nam - Lao PDR Power Interconnector (North)	Viet Nam	Power	Greenfield	400
Muse - Mandalay Railway	Myanmar	Railway	Greenfield	4,000
Tamu - Kalay - Mandalay Railway	Myanmar	Railway	Greenfield	2,500
Dawei - Hitki Railway	Myanmar	Railway	Greenfield	2,200
Mawlamyine - Ye - Dawei Railway Upgrade	Myanmar	Railway	Brownfield	415
Kan Pai Ti - Myitkyina - Tigyain Expressway	Myanmar	Road	Greenfield	840
Takaw - Kyaington Road Upgrading	Myanmar	Road	Brownfield	216
Hpa - An Bridge	Myanmar	Bridge	Greenfield	25
5th Thai - Lao Friendship Bridge	Thailand	Bridge	Greenfield	80
				20,874

* Estimated Cost USD, millions





HOW THE PIPELINE PROJECTS SUPPORT ASEAN'S CONNECTIVITY AGENDA

Economic corridors are routes along which people, services and goods move, stimulating economic growth.

While economic corridors may have different definitions and serve multiple purposes, they typically feature three complementary components: a transport corridor, industrial production centers, and urban centers. As such, economic corridors in the ASEAN region build on the existing infrastructure network and aim at expanding their connectivity, in order to facilitate travel, trade and economic activity, not only within the ASEAN region, but also with neighboring countries.

The major economic corridors in the ASEAN region include the Greater Mekong Sub-region (GMS) economic corridors, the East ASEAN Growth Area (BIMP-EAGA) and the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT). The launch of the Belt and Road Initiative (BRI) in 2013 adds additional economic routes, helping to further connect ASEAN Member States by sea and by land.

Figure 3 provides an overview of the major regional and sub-regional economic corridors. Once the projects selected for the Initial Pipeline (green) and Potential Pipeline (yellow) were over-laid on these corridors, it is evident that there is a close alignment between these projects and the underlying corridors. This demonstrates that the projects in both the Initial and Potential Pipelines complement as well as strengthen the existing economic corridors by enhancing connectivity and facilitating new connections and gateways.

Reducing travel time and cost

Several Initial Pipeline road and rail projects are along existing key economic corridors including the Siem Reap to Ratanakiri National Road Upgrading, the Yangon - Mandalay Expressway Improvement, the Bangkok - Nong Khai High Speed Rail, and Phase II of the Southern Coastal Corridor project. These projects have the potential to strengthen the backbone corridors by shortening travel times, reducing travel costs and enhancing the safe movement of goods and people.

Creating gateways

Other projects play a different function, by creating new gateways along existing economic corridors (such as the Kuala Tanjung International Port Hub), or enhancing existing gateways (like the expansion of Hang Nadim International Airport), and connecting potential future gateways (Nay Pi Taw - Kyaukphyu Expressway).

Enhancing cross-border power trade

Two power interconnections between Lao PDR and neighboring countries (Myanmar and Viet Nam), both of which are supported under recently signed government-to-government memoranda of understanding between the respective countries as part of Lao PDR's integral role as an energy exporter, will contribute to an increase in power trading and an eventual ASEAN power grid. In addition, the interconnector projects will bring electricity to areas with currently poor access, such as in northern Myanmar.

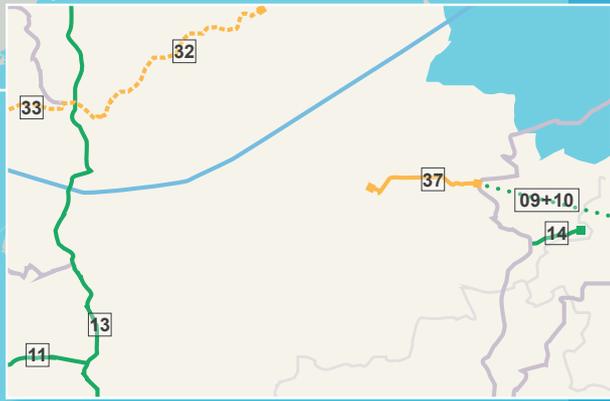
Broaden digital connection

Finally, the ASEAN Digital Hub will potentially involve five countries and position Thailand as one of the digital hubs for the region. This project will form part of the ASEAN Broadband Corridor and supports ASEAN's Internet Exchange Network (AIX) project that recommended encouraging private sector operators to establish more peer-to-peer connections with their ASEAN counterparts across the borders.

Figure 3. Major existing and planned regional economic corridors with Initial & Potential Pipeline Projects



ASEAN'S MAJOR ECONOMIC CORRIDORS WITH PIPELINE PROJECTS



- Bridge 
- Airport 
- Port 
- ICT 
- Road 
- Rail 
- Energy 

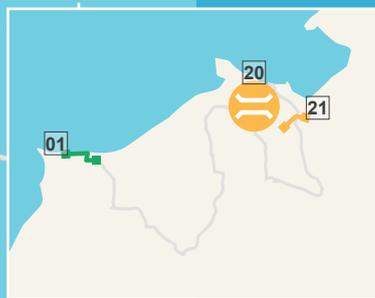
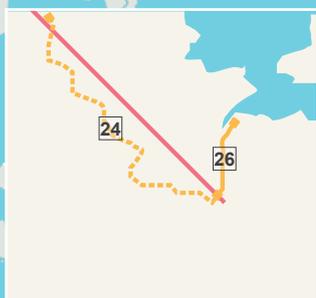
Initial & Potential Pipeline Projects

-  Initial Projects
-  Potential Projects

- 01 Jalan Rasau Road Upgrading
- 02 Siem Reap - Ratanakiri Road Upgrading
- 03 Kuala Tanjung International Hub Port and Industrial Estates - Phase II
- 04 Expansion of Hang Nadim International Airport
- 05 Development of Kijing Port
- 06 Lao PDR National Road No. 2 Upgrading
- 07 Lao PDR National Road No. 8 Upgrading
- 08 Lao PDR - Viet Nam Power Interconnector
- 09 Lao PDR - Myanmar Power Interconnector
- 10 Myanmar - Lao PDR Power Interconnector
- 11 Nay Pyi Taw - Kyaukpyu Expressway
- 12 Muse - Tigyaing - Mandalay Expressway
- 13 Yangon - Mandalay Expressway
- 14 Tarlay - Kyainglat Road Upgrading
- 15 ASEAN Digital Hub
- 16 Hat Yai - Sadao Motorway
- 17 Bangkok - Nong Khai HSR - Phase II
- 18 Southern Coastal Corridor Project - Phase II
- 19 Ho Chi Minh City - Moc Bai Expressway
- 20 Tunnel to Brunei Temburong Bridge
- 21 Jalan Labu Road Upgrading
- 22 Phnom Penh - Bavet Railway
- 23 H.A.S. Hanandjoedin Airport
- 24 Trans-Sumatera Railway: Jambi-Betung - Palembang
- 25 Trans-Sumatera Toll Road: Kuala Tanjung -Tebing Tinggi - Parapat
- 26 Trans-Sumatera Toll Road: Palembang - Tanjung Api - Api
- 27 Vientiane - Mu Gia Railway
- 28 Thakhek - Savannakhet - Pakse - Vung Tao Railway
- 29 National Road No. 18A Upgrading
- 30 Lao PDR - Viet Nam Power Interconnector (North)
- 31 Viet Nam - Lao PDR Power Interconnector (North)
- 32 Muse - Mandalay Railway
- 33 Tamu - Kalay - Mandalay Railway
- 34 Dawei - Htiki Railway
- 35 Mawlamyine - Ye - Dawei Railway Upgrade
- 36 Tigyaing - Kan Paik Ti Expressway
- 37 Takaw - Kyaington Road Upgrading
- 38 Hpa - An Bridge
- 39 5th Thai - Lao Friendship Bridge
- 40 Mu Gia - Vung Ang Railway

Economic Corridors

-  Indonesia - Malaysia -Thailand Growth Triangle (IMT-GT)
-  Greater Mekong Sub-Region (GMS)
-  Belt & Road initiative, Maritime Silk Route
-  Belt & Road initiative, Land Silk Route
-  East ASEAN Growth Area (BIMP-EAGA) Brunei Darussalam, Indonesia, Malaysia, Philippines.



CONNECTIVITY IS ABOUT ENHANCING NETWORKS, AND IMPROVING THEIR FUNCTIONALITY, EFFICIENCY AND RESILIENCE.

Different sectors have different networks associated with them and, over the years, ASEAN has set out specific objectives relating to each sector's network.

The key sectors of transport, energy and ICT are discussed briefly below, first at the strategic level and then with respect to how the pipeline projects can help to enhance these networks and meet ASEAN's connectivity objectives.

ICT

Since its launch in 2011, the ASEAN ICT Masterplan 2015 (AIM 2015) has provided a roadmap for the development of information and communication technology (ICT) at the regional level.

AIM 2020 expanded on AIM 2015 with the aim to "propel ASEAN towards a digitally-enabled economy that is secure, sustainable, and transformative; and to enable an innovative, inclusive and integrated ASEAN Community"⁵.

Over the last few years, ICT in ASEAN has improved significantly, and ICT is today an important engine of economic growth in the region. Costs of internet access and mobile subscription have fallen sharply in most ASEAN Member States, allowing greater connectivity for millions of ASEAN citizens. The region has also experienced a rise in employment in the ICT sector, the emergence of digital government services and the increased awareness of cybersecurity. As part of AIM 2015, the ASEAN Broadband Corridor has contributed to the improvement of broadband connectivity by promoting seamless broadband quality across ASEAN Member States.

The ASEAN Digital Hub project submitted by Thailand is a good example of the push towards advancing ASEAN's ICT infrastructure and expanding broadband connectivity. The project consists of the development of a fiber optic cable project, which will involve 5 countries and position Thailand as one of the digital hubs for the region.

5. ASEAN ICT Masterplan 2020: <https://asean.org/asean-economic-community/asean-telecommunications-and-it-ministers-meeting-telmin/other-documents/>



Power Interconnection

The main regional initiative relating to energy interconnection is the ASEAN Power Grid (APG).

Under the APG, it is expected that the ASEAN Member States would be able to gradually achieve full system-to-system integration of national electricity networks through interconnections, first bilaterally and then sub-regionally. Much of the region's energy trade centers on Lao PDR (a country which sells 80% of its generated power to other countries) as the 'battery' of ASEAN, with plans to develop more than 10 GW and export up to 18 GW to its neighbors in the future. Government-to-government Memorandums of Understanding (MoU) have been signed between:

- Lao PDR - Thailand (3 GW - 9 GW),
- Lao PDR - Viet Nam (1 GW - 5 GW),
- Lao PDR - Cambodia and Lao PDR - Myanmar (300 - 500 MW),
- China - Lao PDR - Thailand (1 GW - 3 GW).

Of the projects selected for the Initial Pipeline, there are two interconnector projects: one from Lao PDR - Myanmar and the other from Southern Lao PDR - Southern Viet Nam (comprising 4 different projects, as each interconnector project had a separate application from either side). These two projects fully support regional plans for energy integration. According to the ASEAN Center for Energy, Myanmar plans to be a net exporter to China and a net importer from Lao PDR. Similarly, Viet Nam is both a net importer (from Lao PDR) and a net exporter (to Cambodia). A Lao PDR - Viet Nam Energy Cooperation MoU signed on October 5th, 2016 for the joint development of power projects in Lao PDR, envisions a gradual increase of power being exported from Lao PDR to Viet Nam over the next 11 years, reaching about 5 GW by 2030.

Thus, the two interconnector projects in the Initial Pipeline are both part of Lao PDR's master plan for exporting power and would fulfill the existing MOUs signed between the governments, as well as contribute to the vision of the GMS region as a coherent power grid.

Transport Networks

As highlighted in the Kuala Lumpur Transport Strategic Plan (ASEAN Transport Strategic Plan 2016 - 2025), transport has been recognized by ASEAN as being a cornerstone of economic development and integration, as it plays a critical role in the movement of goods, services and people. In addition, it helps bind ASEAN Member States closer together and build the ASEAN Economic Community that is vital for the future of ASEAN Member States.

The major focus of ASEAN over the last few years has been to complete the Asian Highway Network (AHN) and the ASEAN part of the Asian Railway Network – the Singapore - Kunming Rail Link (SKRL) Project. The Initial and Potential Pipeline projects were mapped against the major transit corridors of the AHN network and the Asian Railway Network. The map in Figure 4 shows that, similarly to the economic corridors map, there is a close alignment between the transport projects and these transit corridors.

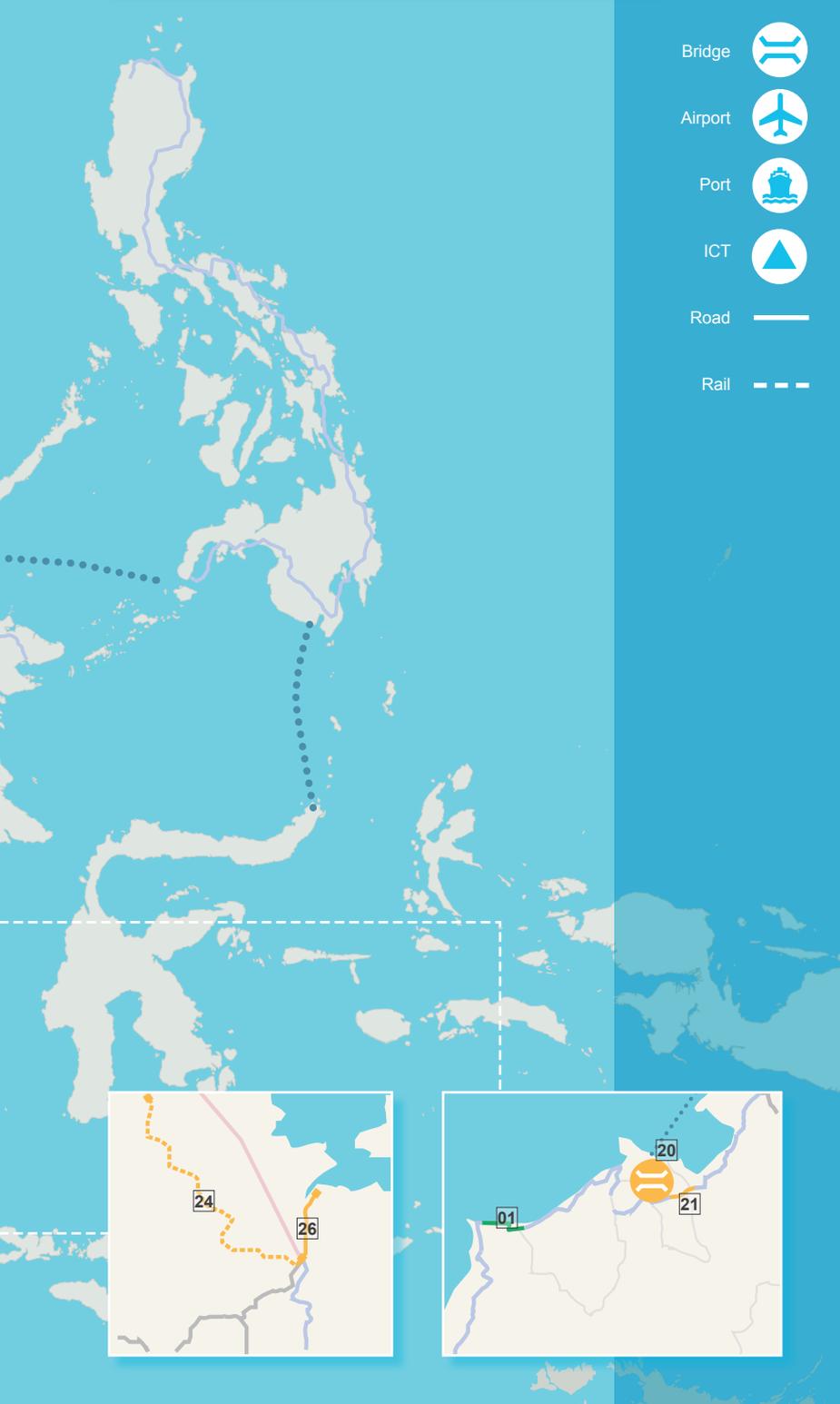
While the AHN is broadly complete, the focus is now on: i) upgrading the network, ii) installing common road signs and iii) improving road safety. Several Initial and Potential Pipeline projects support these objectives, by upgrading to ASEAN Class III Standards segments of the AHN that are currently in poor condition (e.g. National Road No. 2 and National Road No. 8 in Lao PDR, and upgrading the Takaw to Kyaington section of AHN 2 in Myanmar) or 'filling in' key gaps in the road network by connecting ASEAN Member States with neighboring countries and strengthening crucial transport and freight corridors such as the HCMC - Moc Bai Expressway connecting Viet Nam with Cambodia, the Tarlay - Phasho - Kyainglat road connecting Myanmar with Lao PDR and the Pan-Borneo Highway connecting Borneo with Malaysia.

As for the SKRL project, most of the link is now complete, aside from three sections connecting Thailand / Myanmar, Cambodia / Viet Nam and China / Myanmar. However, several of the existing sections need upgrading. Potential Pipeline projects (such as the Vientiane - Vung Ang Railway) will complete some of the missing links of the SKRL.

Figure 4. Major existing and planned regional transport corridors with Initial & Potential Pipeline Projects



MAJOR EXISTING AND PLANNED REGIONAL TRANSPORT CORRIDORS WITH PIPELINE PROJECTS



- Bridge 
- Airport 
- Port 
- ICT 
- Road 
- Rail 

Initial & Potential Pipeline Projects

-  Initial Projects
-  Potential Projects

- 01 Jalan Rasau Road Upgrading
- 02 Siem Reap - Ratanakiri Road Upgrading
- 03 Kuala Tanjung International Hub Port and Industrial Estates - Phase II
- 04 Expansion of Hang Nadim International Airport
- 05 Development of Kijing Port
- 06 Lao PDR National Road No. 2 Upgrading
- 07 Lao PDR National Road No. 8 Upgrading
- 08 Lao PDR - Viet Nam Power Interconnector*
- 09 Lao PDR - Myanmar Power Interconnector*
- 10 Myanmar - Lao PDR Power Interconnector*
- 11 Nay Pyi Taw - Kyaukpyu Expressway
- 12 Muse - Tigyaing - Mandalay Expressway
- 13 Yangon - Mandalay Expressway
- 14 Tarlay - Kyainglat Road Upgrading
- 15 ASEAN Digital Hub
- 16 Hat Yai - Sadao Motorway
- 17 Bangkok - Nong Khai HSR - Phase II
- 18 Southern Coastal Corridor Project - Phase II
- 19 Ho Chi Minh City - Moc Bai Expressway
- 20 Tunnel to Brunei Temburong Bridge
- 21 Jalan Labu Road Upgrading
- 22 Phnom Penh - Bavet Railway
- 23 H.A.S. Hanandjoedin Airport
- 24 Trans-Sumatera Railway: Jambi-Betung - Palembang
- 25 Trans-Sumatera Toll Road: Kuala Tanjung -Tebing Tinggi - Parapat
- 26 Trans-Sumatera Toll Road: Palembang - Tanjung Api - Api
- 27 Vientiane - Mu Gia Railway
- 28 Thakhek - Savannakhet - Pakse - Vung Tao Railway
- 29 National Road No. 18A Upgrading
- 30 Lao PDR - Viet Nam Power Interconnector (North)*
- 31 Viet Nam - Lao PDR Power Interconnector (North)*
- 32 Muse - Mandalay Railway
- 33 Tamu - Kalay - Mandalay Railway
- 34 Dawei - Htiki Railway
- 35 Mawlamyine - Ye - Dawei Railway Upgrade
- 36 Tigyaing - Kan Paik Ti Expressway
- 37 Takaw - Kyaington Road Upgrading
- 38 Hpa - An Bridge
- 39 5th Thai - Lao Friendship Bridge
- 40 Mu Gia - Vung Ang Railway

Transport Corridors

-  Asian Highway Network
-  Asian Rail Network (Existing)
-  Asian Rail Network (Planned)
-  Roll-On-Roll-Off Shipping Route (RoRo)

* Not shown on this map

CONCLUSIONS & WAY FORWARD

DEVELOPING AN INITIAL PIPELINE OF ASEAN INFRASTRUCTURE PROJECTS IS ONLY ONE OF THE MANY STEPS NECESSARY TO ENHANCE ASEAN CONNECTIVITY.

It is important to ensure that this rolling pipeline initiative does not replace detailed national and regional-level master planning for infrastructure, which should, inter alia, take into account a proper needs assessment of the economic corridors in ASEAN, connectivity needs for major international gateways and trade patterns and flows, as well as regional disparities. Indeed, such master planning (particularly at the ASEAN regional level) would be a useful basis for “rolling” the pipeline and would ideally integrate other regional/sub-regional master plans and initiatives.

In addition, physical connectivity infrastructure will only be able to reach its full economic potential if there is a supportive enabling environment i.e. “soft infrastructure.” MPAC 2025 recognizes this through its complementary pillars “institutional connectivity” and “people-to-people connectivity.” Indeed, to maximize the socio-economic gains from investment in physical infrastructure, it will be important to continue to remove barriers to regional trade and competition, harmonize regulations and develop regionally-recognized standards. These measures, when taken alongside the development of physical infrastructure, will help effectively reduce the costs of trade and spur overall regional connectivity and growth. For those countries looking to attract private sector participation in the Initial Pipeline projects, it will also be critical to ensure that the institutional, legal and regulatory enabling environment is supportive of such private investment.

Finally, to achieve both the implementation of the physical infrastructure as well as the necessary policy reforms, there is a need for continued dialogue, coordination and cooperation between the ASEAN Member States. Some of this cooperation could potentially come in the form of cross-regional capacity building, to enable the ASEAN Member States to collectively plan, assess and structure regional infrastructure projects so as to maximize the benefits to the region as a whole.





**ONE VISION.
ONE IDENTITY.
ONE COMMUNITY.**