



Strategic Plan on Enhancing Railway Interoperability among ASEAN Member States



one vision
one identity
one community

Strategic Plan on Enhancing Rail Interoperability among ASEAN Member States

The Association of Southeast Asian Nations (ASEAN) was established on 8 August 1967. The Member States are Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, and Viet Nam.

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Strategic Plan on Enhancing Rail Interoperability among ASEAN Member States

Jakarta, ASEAN Secretariat, January 2026

385.0959

1. ASEAN – Transportation – Rail Transport
2. Railway – Rail Infrastructure – Integrated ASEAN Rail Network



ASEAN: A Community of Opportunities for All

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With the assistance from:



The *Strategic Plan on Enhancing Rail Interoperability among ASEAN Member States* has been produced with the assistance from the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) under project entitled “*Leveraging Trans-Asian Railway network for efficient and resilient transport network in ASEAN and beyond*”.

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Acknowledgments:

The Strategic Plan on Enhancing Rail Interoperability was prepared after extensive consultations with the ASEAN Secretariat and ASEAN Member States. In the finalisation of the Strategic Plan, the guidance received from the ASEAN Secretariat and the inputs received from the ASEAN Member States are duly acknowledged.

Process:

The preliminary draft of the Strategic Plan was prepared by ESCAP Consultant together with Transport Division of ESCAP. It was first discussed at the Expert Group Meeting held in Kuala Lumpur, Malaysia, in February 2025 and based on the inputs received, it was finalised at the High-Level Meeting on Enhancing Rail Interoperability held in Vientiane, Lao People’s Democratic Republic, in July 2025. The Sixth Meeting of the ASEAN Railway Sub-Working Group and the Thirty-fourth Meeting of the ASEAN Land Transport Working Group held in August 2025, in Phnom Penh, Cambodia, approved the Strategic Plan and recommended for its adoption at ASEAN Transport Ministers’ Meeting. Thereon the Strategic Plan was adopted at the 31st ASEAN Transport Ministers’ Meeting held in November 2025 in Nay Pyi Taw, Myanmar.



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The ASEAN Secretariat

2026

Abbreviations

No	Acronyms	Full Form
1.	ACTS	ASEAN Customs Transit System
2.	AEC	ASEAN Economic Community
3.	AMS	ASEAN Member States
4.	ARA	ASEAN Rail Agency
5.	ARDP	ASEAN Rail Digitalisation Program
6.	ARSWG	ASEAN Railway Sub-Working Group
7.	ASRA	ASEAN Single Railway Area
8.	EFTA	European Free Trade Association
9.	EU	European Union
10.	ERA	European Union Agency for Railway
11.	5G	Fifth Generation
12.	FRMS	Future Rail Mobile Communication System
13.	GMS	Guarantee Management System
14.	OTIF	Intergovernmental Organisation for International Carriage by Rail
15.	ITF	International Transport Forum
16.	UIC	International Union of Railways
17.	MTO	Multimodal Transport Operators
18.	NCTS	New Computerised Transit System
19.	NCA	North and Central Asia
20.	OSJD	Organisation for Co-operation between Railways
21.	RDS	Reference Data System
22.	SKRL	Singapore Kunming Railway Line
23.	TTRI	Task Team for Railway Interoperability
24.	TSI	Technical Specifications for Interoperability
25.	ASEAN	The Association of Southeast Asian Nations
26.	TR	Trader Repository
27.	TAR	Trans Asian Railway
28.	ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
29.	UTLC ERA	United Transport Logistic Company Eurasian Rail Alliance
30.	UMS	User Management System

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1 EXECUTIVE SUMMARY

Transport demand in ASEAN Member States continues to increase on the back of sustained economic growth. Meeting this demand in a sustainable manner is a key challenge for the transport policy makers in these countries.

Overreliance on road transport has led to unsustainable outcomes such as rising carbon emissions, congestion, and pollution. Mindful of this, most ASEAN Member States are now investing heavily in rail and have also set ambitious modal shift targets to bend the curve towards more sustainable transport.

The operationalisation of Lao-China railway in December 2021 provides new opportunities and has also triggered further interest in rail transport across the ASEAN Member States. Although rail transport is energy efficient and environment friendly, global experience suggests that the shift to rail does not happen easily and needs sustained efforts.

While building the rail infrastructure, equally important would be for ASEAN Member States to work closely to ensure that they get most from their investments in the capital-intensive rail infrastructure by developing interoperable railway systems. This would enhance competitiveness of rail transport attracting more passenger and freight.

Most ASEAN Member States are part of ESCAP's Trans-Asian Railway network and by virtue of that ESCAP has been working closely with ASEAN Member States in supporting them to fully harnessing the emerging opportunities in international rail transport.

These activities were ratcheted up post-pandemic through the organisation of series of webinars in 2021-2022 that culminated in a recommendation to develop a strategic plan to enhance rail interoperability among ASEAN Member States. Subsequently, in 2023, ESCAP launched a dedicated project to support ASEAN Member States in strengthening rail transport.

Under the project, ESCAP conducted extensive consultations with ASEAN Member States and relevant organisations, resulting in the development of this strategic plan on enhancing rail interoperability among ASEAN Member States. The strategic plan serves as a high-level policy document designed to guide rail policymakers and would support laying a strong foundation for a resilient and integrated rail transport system among the ASEAN Member States in the long term.

2 THE STRATEGIC PLAN

The Strategic Plan outlines fourteen (14) key measures and provides corresponding actions and implementation pathways to improve rail interoperability among the ASEAN Member States. The first five are designated as core actions, while the remaining actions serve as supporting measures.

Fourteen actions for enhancing rail interoperability among ASEAN Member States

Core Actions

1

First action is to *establish agreed target levels of rail interoperability* and preferred modes of rail border crossings among ASEAN Member States. These levels can be agreed based on each country's national priorities as well as common priorities of AMS for enhancing international railway transport. It can also serve as a basis for identifying actions related to both soft and hard infrastructure requirements.

2

Second action is to set up a *task team on rail interoperability* consisting of nominated rail experts from ASEAN railways to identify technical parameters to be standardised or harmonised for agreed level of interoperability and develop action plans or agreements as needed for their implementation. This action is crucial to ensure that the technical parameters of rail infrastructure and rolling stock are synchronised with desired levels of interoperability. It would also help reduce operating costs and make rail more competitive.

3

Third action is for countries to *consider joining one or both international rail organisations* and harmonise the rail consignment note among ASEAN Member States by aligning it with the combined consignment note. This action would ensure legal interoperability along international railway corridors, especially for transit shipments involving three (3) or more countries, by eliminating the need for reconsignment at border crossings, thereby reducing delays and promoting a modal shift to rail freight.

4

Fourth action is *promoting electronic information exchange both among railway operators and between railways and customs authorities* to streamline border crossing procedures. This action aims to enhance the efficiency of border crossing formalities and reduce delays caused by reliance on paper-based documents.

5

Fifth action is to leverage the expertise of international organisations and *develop an action plan to transition the rail interoperability task team into a formal ASEAN railway agency*, that support the realisation of ASEAN Economic Community. This action is essential for enabling ASEAN Member States to consistently address rail interoperability challenges, while ensuring that global best practices are adapted to fit the specific needs and priorities of ASEAN rail systems.

Supporting Actions

6

Sixth action is to *develop an ASEAN rail digitalisation program* to support rail interoperability at all levels. Rail digitalisation is no longer seen as optional for enhancing the competitiveness of the rail sector. The key challenge lies in determining how and where to implement digital solutions to maximise their benefits. In this regard, a dedicated programme can ensure that synergies are created and need for countries with special needs are addressed appropriately.

7

Seventh action is to *develop a corridor management mechanism for the rail corridor linking Malaysia-Thailand-Lao People's Democratic Republic-China*. Such a corridor mechanism can help focus the related actions where they are most needed. With a dedicated structure, a range of issues that matter to shippers on international shipment including single tariffs, marketing of corridor and the need to enhance cross-border rail cooperation among countries, can be addressed to ensure efficient rail border crossing.

8

Eighth action is to *put in place a compatible national legal and regulatory framework to support the agreed level of rail interoperability*. This includes range of action at national level on rail safety including the establishment of the relevant oversight bodies; promoting private sector participation through enabling public-private partnership frameworks; and legislation/regulations to support electronic information exchange.

9

Ninth action is to *decide track gauge issues on case-by-case basis after thorough consideration of comprehensive economic, social and environment impact assessment* at both national and regional levels, including considerations for rail interoperability. Existence of multiple track gauges is major issue that ASEAN Member States need to deal with and there is no single way to address it. Each railway line needs to be evaluated to reconcile the conflicting requirements and competing priorities and determine the most effective solution.

10

Tenth action is on *strengthening capacity building for rail interoperability* in partnership with relevant international organisation. It hardly needs to be emphasised that it is the men behind the wheels that matter the most for an efficient and interoperable railway transport. Therefore, this action emphasises the need to continuously upgrade both technical competencies and soft skills, such as innovation, collaboration, and customer-oriented thinking, to ensure railway professionals can effectively engage within the sector and with stakeholders outside railway community to deliver best services.

11

Eleventh action is on undertaking a *comprehensive assessment of rail financing requirements of AMS along with possible financing options*. Enhancing rail interoperability among AMS would require additional financing. As most rail investments are financed through government budgets that are mostly constrained, AMS railway agencies would need to diversify the sources of financing. In this regard, emerging sources of financing, particularly the climate finance should be fully harnessed.

12

Twelfth action is to establish an *appropriate mechanism to strengthen collaboration among AMS on development of high-speed rail*. The rapid developments on high-speed rail in AMS have raised multiple challenges including land acquisition issues, access to technology, environmental concerns, financing HSR projects, debt sustainability. Given these challenges, involving significant costs, wider socio-economic and environment implications, regional cooperation on HSR planning and its implementation is both necessary and beneficial.

13

Thirteenth action is to *institutionalise experience sharing and capacity building for urban rail development in AMS*. As most AMS are rapidly urbanising, it is vital to ensure sustainable mobility in the cities. In this direction, urban rail has crucial role to address many of the negative externalities of transport, namely, carbon emissions, traffic congestion and air pollution. By strengthening cooperation and knowledge exchange, through capacity building, AMS can fully harness the benefits of investments in urban rail.

14

Fourteenth action is to *promote rail to enhance sustainability of transport in AMS*. Due to its low carbon footprints and high energy efficiency, rail can meet rising demand for transport among AMS, while minimising negative externalities. However, increasing share of rail in the transport mix is a formidable task and would need consistent and sustained efforts from AMS and development partners at urban, national and regional levels.

3 STRATEGIC PLAN ON ENHANCING RAIL INTEROPERABILITY AMONG ASEAN MEMBER STATES

Background

ASEAN Member States collectively are third in Asia and fifth in the world in terms of the economic size that was roughly USD 3.6 trillion in 2022 and growing at five per cent annually. At 22 per cent ASEAN also has one of highest intra-regional trade. The International Transport Outlook 2023 estimates that passenger kilometres, and tonne-kilometre of freight for ASEAN Member States are expected to double and triple respectively between 2020 and 2050.

Harnessing these economic opportunities, however, would need a robust transport system that facilitates trade and boost investment. Over reliance on road transport during past few decades has heightened the negative externalities of transport among ASEAN Member States to unsustainable levels. Transport sector in ASEAN is now responsible for nearly 27 per cent of final energy demand and 21 per cent of total fossil fuel emissions.

Furthermore, the transport emissions in ASEAN Member States are expected to grow further by nearly 50 per cent from the current level of 260 mt to 410 mt by 2050 and most of this increase is expected from freight transport.

Heavy reliance on road transport has led to unsustainable externalities.

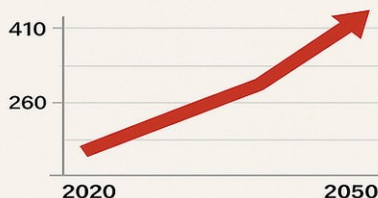


Transport now accounts for

27% of final energy demand

21% of fossil fuel emissions in ASEAN

Transport emissions are projected to rise from **260 mt → 410 mt** by 2050 (a 50% increase).



Freight transport will be the main driver of this growth.

The rapid growth in demand for transport in ASEAN presents a major challenge due to corresponding rise in carbon emissions. The existing policies and measures are expected to play a crucial role in curbing the growth of these emissions. However, continued efforts and more robust policies will be necessary to achieve more ambitious emissions reduction targets. Current projections for the transport sector's emissions fall significantly short of what is required to align with the Paris Agreement's targets.

For ASEAN domestic transport between 2020 and 2050, ITF modelling indicates a growth of 54 per cent in carbon emissions with existing policies. However, for the 1.5-degree pathway, a more than 90 per cent reduction is required, i.e., about 20 million tonnes by 2050¹. In addition, the last decade has seen a widening gap in infrastructure investment with ASEAN's Road network expanding annually at 3.2 per cent as compared to 1.5 per cent for rail.

Therefore, to further propel sustainable growth among ASEAN Member States, a resilient low carbon transport system is urgently needed. Railways in ASEAN constitute about 2.6 and 3.6 per cent respectively of passenger and freight demand and emit about 1.1 per cent of carbon emissions and consume one per cent of energy.

As can be seen in the figure below the rail emissions is substantively lower than road transport:

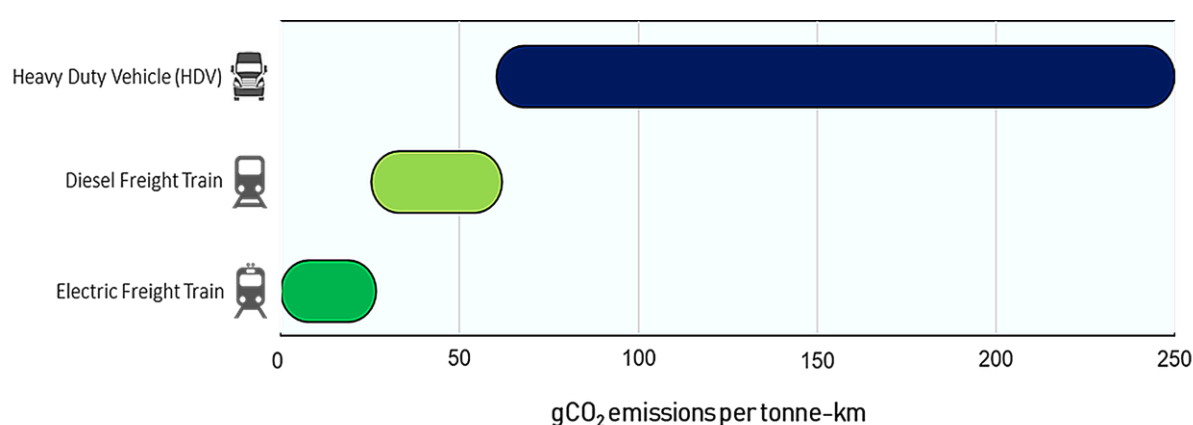


Figure 1. CO₂ emissions per mode
(Averaged from OECD, "Freight transport," 2020. [Online].
Available: <https://data.oecd.org/transport/freight-transport.htm>)

Rail can, therefore, play a larger role in meeting growing demand for transport in ASEAN Member States and beyond while keeping emissions and other negative transport externalities under check. Promoting rail transport should be key policy options for ASEAN Member States in achieving the Paris Agreement's objective of limiting global warming to below 2°C.

The recent operationalisation of the Lao PDR-China railway line has the potential to provide a major momentum to greater use of rail in Southeast Asia and beyond. It fills in one of the major missing links along the Trans-Asian Railway (TAR) Network, linking the railway network of ASEAN Member States (AMS) with the wider railway corridors

¹Keramidas, K., Fosse, F., Diaz Rincon, A., Dowling, P., Garaffa, R., Ordonez, J., Russ, P., Schade, B., Schmitz, A., Soria Ramirez, A., Van Der Vorst, C. and Weitzel, M., Global Energy and Climate Outlook 2023, Publications Office of the European Union, Luxembourg, 2023, doi:10.2760/836798, JRC136265

along the TAR Network, and, notably, making it possible to connect the railways between ASEAN and North and Central Asia (NCA).

However, maximising the benefits from this new connection requires a much stronger cooperation on rail issues among AMS, China and their current and potential trading partners in North and Central Asia in particular. Currently, cross-border rail transport between AMS faces significant challenges and delays, due to the lack of rail interoperability and limited coordination in rail development efforts.

Furthermore, stronger inter-subregional cooperation is needed to fully leverage the potential of this emerging connection in enhancing AMS transport linkages with other sub-regions, particularly the NCA countries, where countries are actively seeking to diversify their transport and trade connection. The need to enhance rail interoperability to improve rail competitiveness among AMS was emphasised during the joint webinars on strengthening rail transport that were organised by ESCAP and ASEAN during 2021 and early 2022.

The last webinar recommended developing a strategic plan for enhancing rail interoperability among AMS and beyond to augment rail competitiveness in ASEAN. The strategic plan, while providing political assertion and coherence to such initiatives, would create synergies through partnerships as well as bring the expertise of global railway organisations for appropriate consideration by the ASEAN Member States.

Accordingly, the strategic plan, which was developed with the support from ESCAP, aims to serve as a high-level policy document for ASEAN.

Key issues in enhancing rail interoperability in ASEAN Member States and related actions

1. Defining and agreeing on the levels of rail interoperability

Railways development started in the 19th century as self-regulated entities in charge of constructing and maintaining their infrastructure (tracks, tunnels, bridges, stations, shops) and providing transport services.

Generally, each railway operator had full responsibility for operating services on its railway network. In many cases, almost every railway was developed based on its specific technical standards, operating rules, and commercial policies with the customers.

Economic development, requiring more trade between different countries or regions of the world, created a new pattern for business based on gradual economic integration and, lately, on globalisation. Trade now is based on complex logistic chains, where transport plays a crucial role.

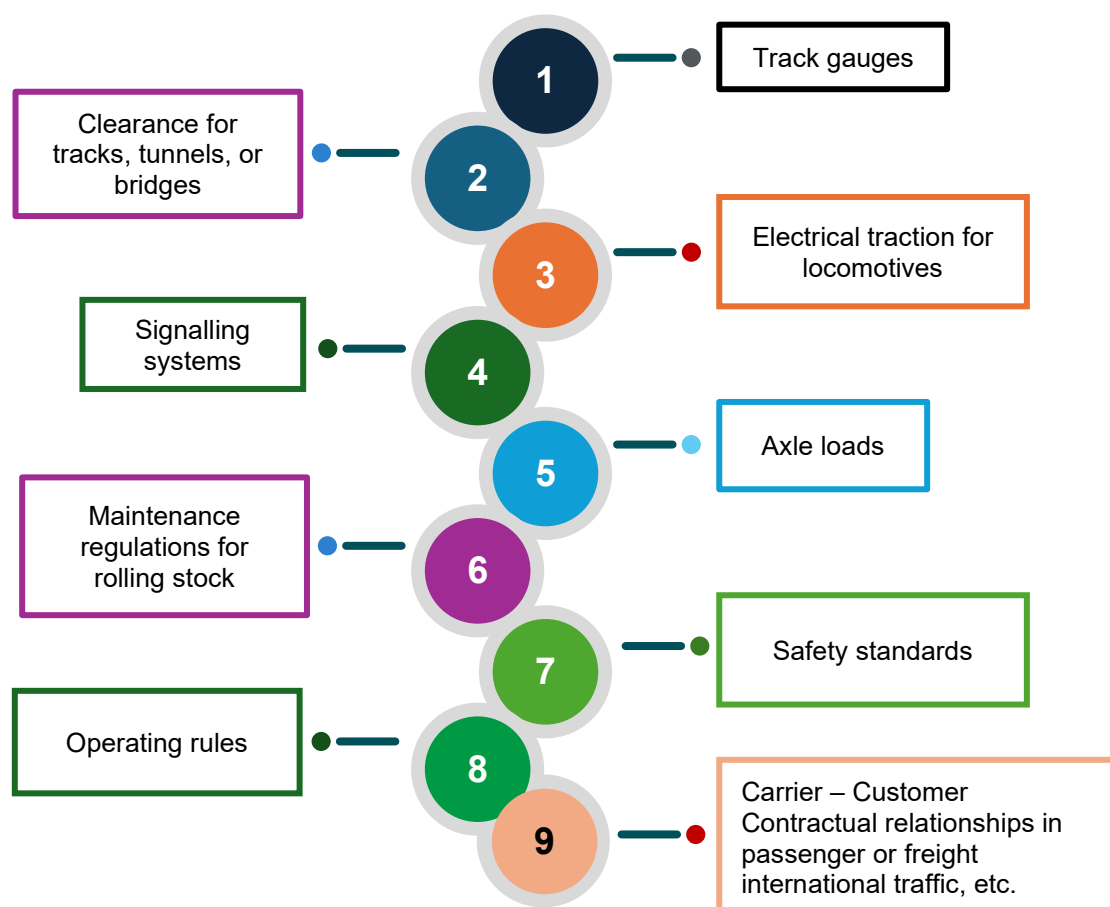
Railways must transition from operating as isolated, self-regulated entities to adapting to the demands of a rapidly evolving environment. Modern rail systems need to be flexible and responsive to the dynamic change of the market, aligning with the shifting needs of the customers.

Consequently, to remain competitive, railways need to interconnect their networks to deliver seamless transport services from origin to destination, regardless of the number of railway operators or national railway networks involved. The railway community has defined and implemented multiple layers of common rules and standards; all these have the generic name of ‘interoperability’.

The definition of interoperability, in railway terminology, is given by Directive 2008/57/EC as follows:

“Interoperability means the ability of a rail system to allow the safe and uninterrupted movement of trains which accomplish the required levels of performance for these lines. This ability depends on all the regulatory, technical, and operational conditions that must be met to satisfy the essential requirements”.

Providing a railway transport service from origin to destination means eliminating the obstacles created by existing differences between the national networks:



Many countries allocate huge budgets to eliminate such incompatibilities and implement uniform technical characteristics to the interconnected networks, new common regulations, and working rules.

Achieving interoperability requires close cooperation among various railway operators. It is important to point out that preventing the creation of barriers to interoperability by making correct decisions during the development of international railway corridors is always less costly than working to eliminate existing obstacles that arise from insufficient coordination in the design.

In the AMS, the development and operationalisation of the regional railway network is still in its early stages. Now it is an appropriate moment to align all efforts and prevent the emergence of barriers to interoperability. Achieving higher railway interoperability requires a coordinated approach involving the three components of rail interoperability:

Legal interoperability that is unified contractual obligations of the railway operators involved in the process vis-a-vis customer, from origin to destination of the transport process



Technical interoperability that is the compatible technical parameters of railways infrastructure and rolling stock from origin to destination



Operational interoperability that the harmonised operation practice over an international route



The three components of railway interoperability (legal, technical, and operational) are tightly interconnected, and only through coordinated implementation of these three components the expected results will be generated.

The unified legal framework for all railways is the foundation of the process. Accepting uniform legal responsibilities of all involved railway operators in the relationship with the customers is essential.

At the same time, achieving technical interoperability through significant investments in infrastructure and rolling stock can only be justified if there is appropriate operational interoperability to realise it. While considering the three components of rail interoperability, it is imperative to consider how the rail traffic among neighbouring countries is organised.

The way rail traffic is organised among neighbouring countries can be categorised into three levels of rail interoperability.

Levels of railway interoperability - The levels of interoperability among railways participating in international transport is determined by the extent of barriers that hinder the seamless movement of trains from origin to destination across national borders along the route.

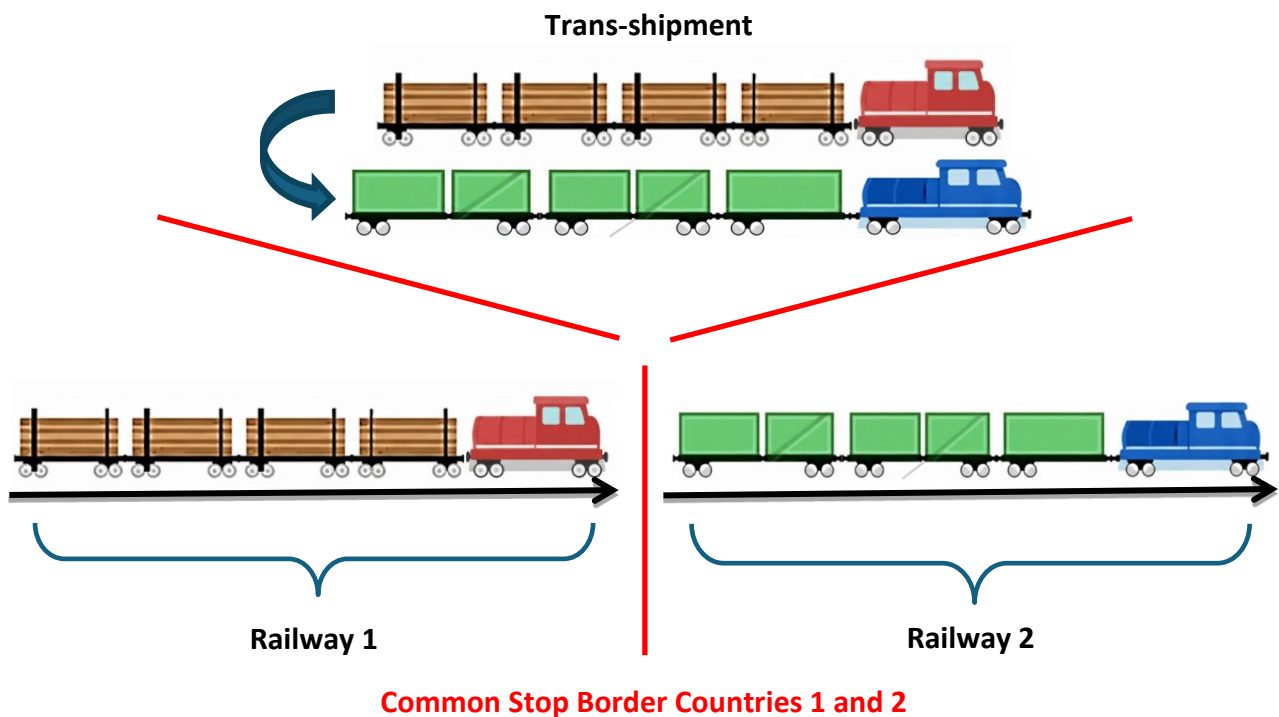


Figure 2. Level A: Wagons and Locomotive of the train cannot cross the border

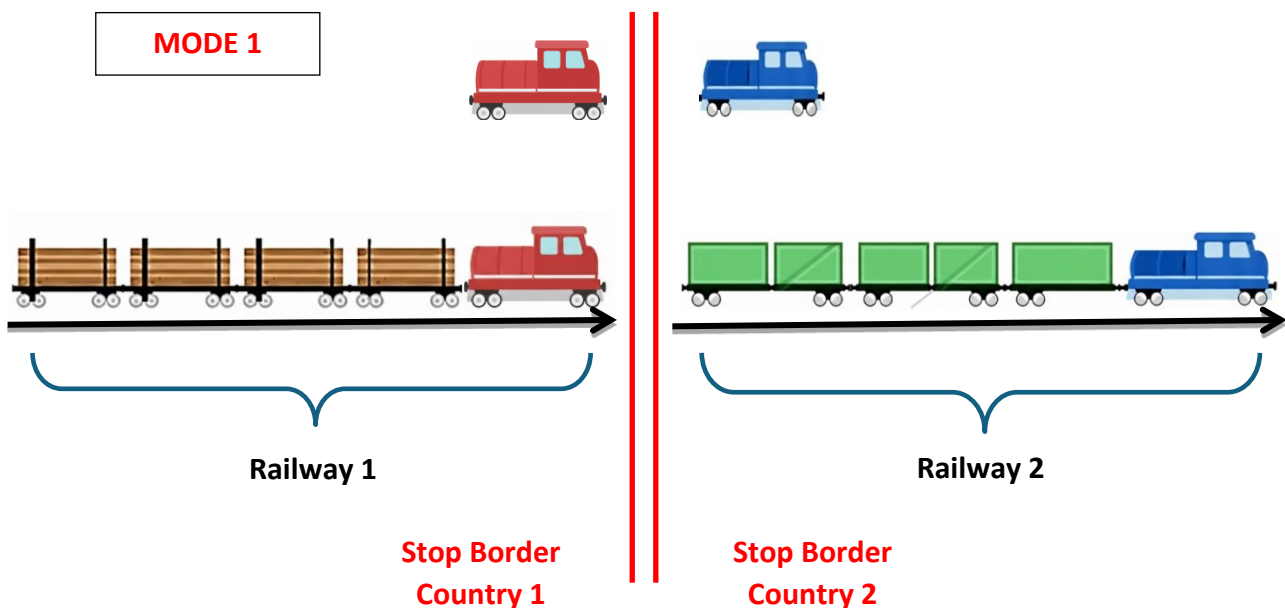


Figure 3. Level B: Wagons of the train can cross the border, but the locomotive cannot

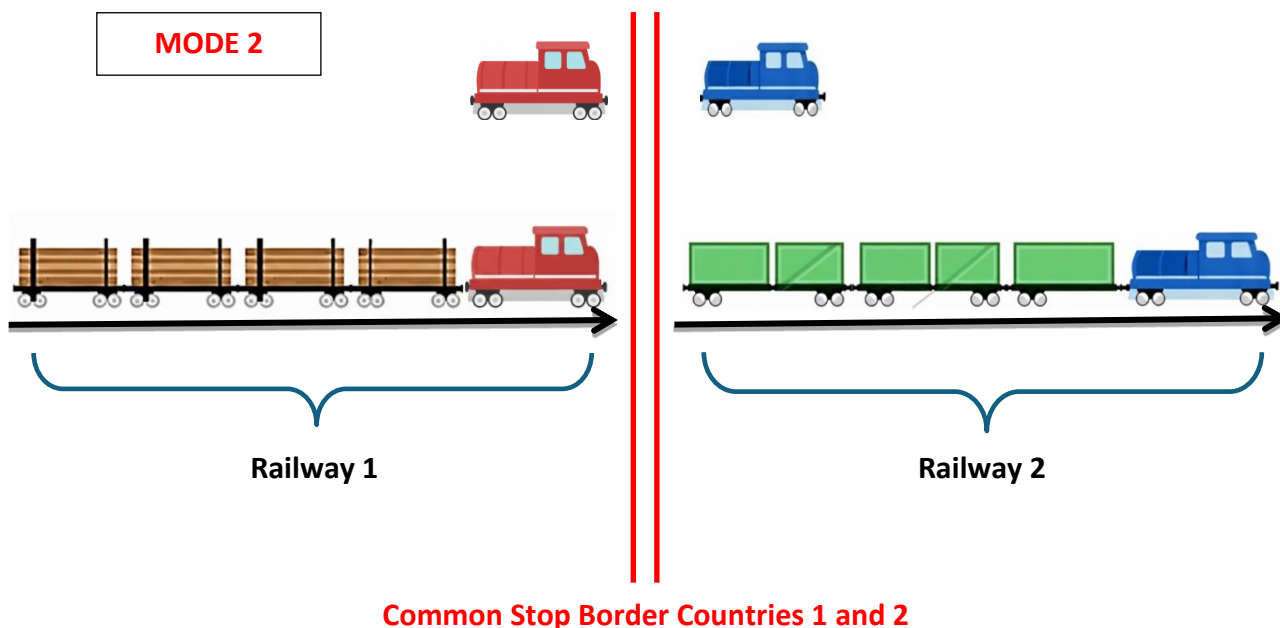


Figure 3. Level B (cont.): Wagons of the train can cross the border, but the locomotive cannot

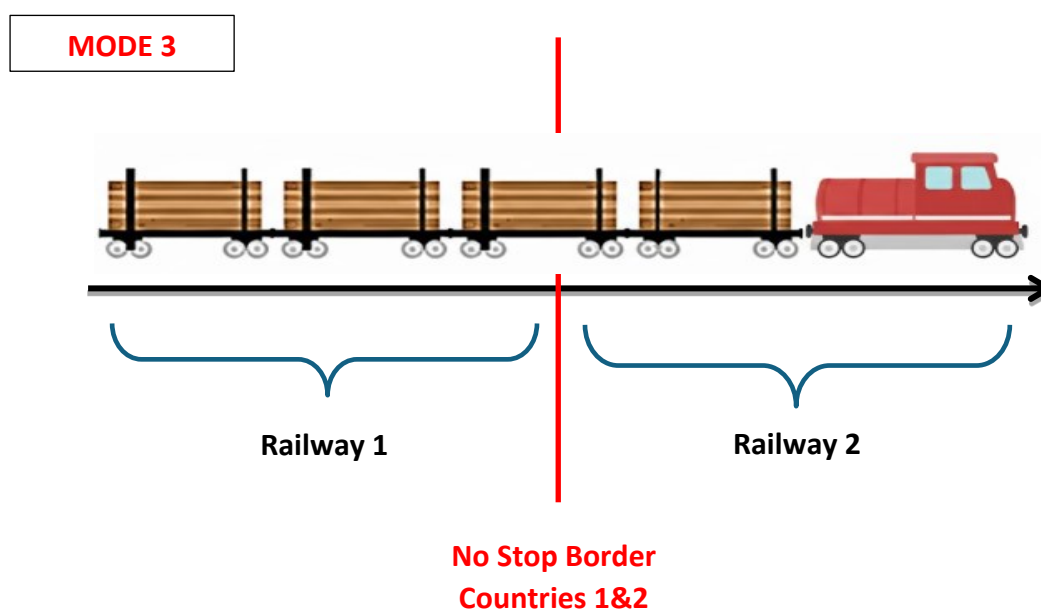


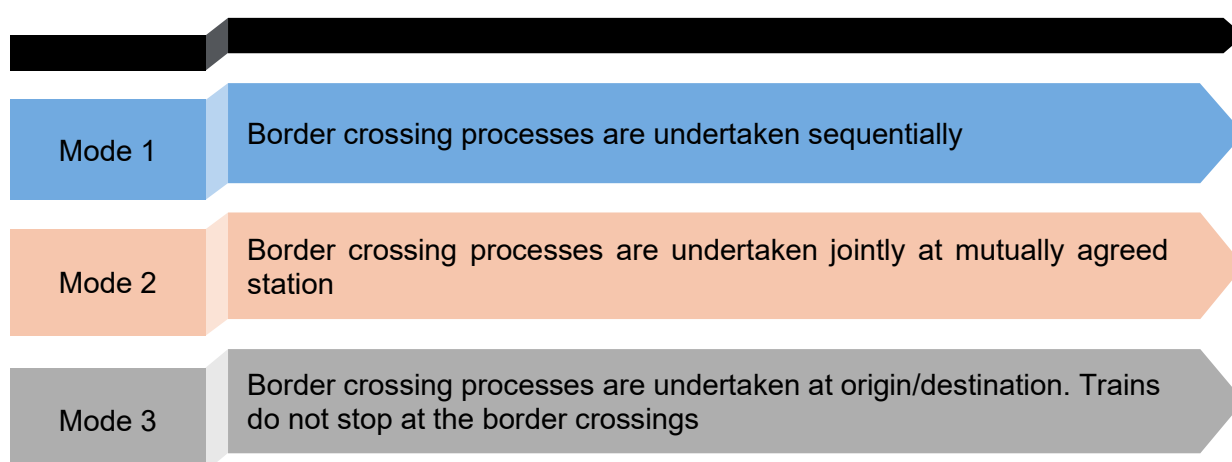
Figure 4. Level C: Wagons & Locomotive of the train can cross the border

It is essential to highlight that the discussion on levels of railway interoperability must not be limited to the technical barriers, which obviously impedes the smooth circulation of trains when crossing a border point between two railway networks. Levels A or B of interoperability can happen not only due to technical incompatibilities but also due to legal or operational obstacles between neighbouring countries.

Two technically perfectly compatible railways (Level C) may be forced to run trains between their networks on degraded interoperability (Level B or even Level A) when they do not adequately address operational or legal barriers.

Two neighbouring countries may decide to limit the interoperability of their railways for various reasons (e.g., political, security, etc.), no matter the existing technical interoperability.

Related and relevant to levels of rail interoperability is the modes of border crossing that are defined as follows:



Achieving the interoperability of railways requires cooperation, heavy investment, and a long time. It is recommended that the ASEAN Member States start working in this direction as soon as possible and define the levels of interoperability they plan to achieve gradually on each international route.

For each pair of rail border crossing among ASEAN Member States, the current and future level of interoperability should be defined explicitly along with modes of railway border crossings. Such elaboration of interoperability levels would help countries to align their rail investments and related actions in accordance with desired levels of interoperability.

As an example, current practice of rail border crossing between Lao and China is **level A- mode 1**, as trains stop at each border crossing in their respective country. After mutual discussions among countries, this pair can be taken to level A mode 2, where border formalities are accomplished at one border station. Furthermore, since there is no break of gauge at this border crossing, eventually both countries could achieve highest level of interoperability that is level C with mode 3 border crossing where trains do not stop at the border crossing and all the required control measures are accomplished at origin or destination station.

This example is just to show how rail interoperability can be gradually improved depending on the ambition and agreement between the countries. Therefore, agreeing on target level of interoperability would allow countries to plan actions according to the desired levels of interoperability. The first recommended action is summarised below:

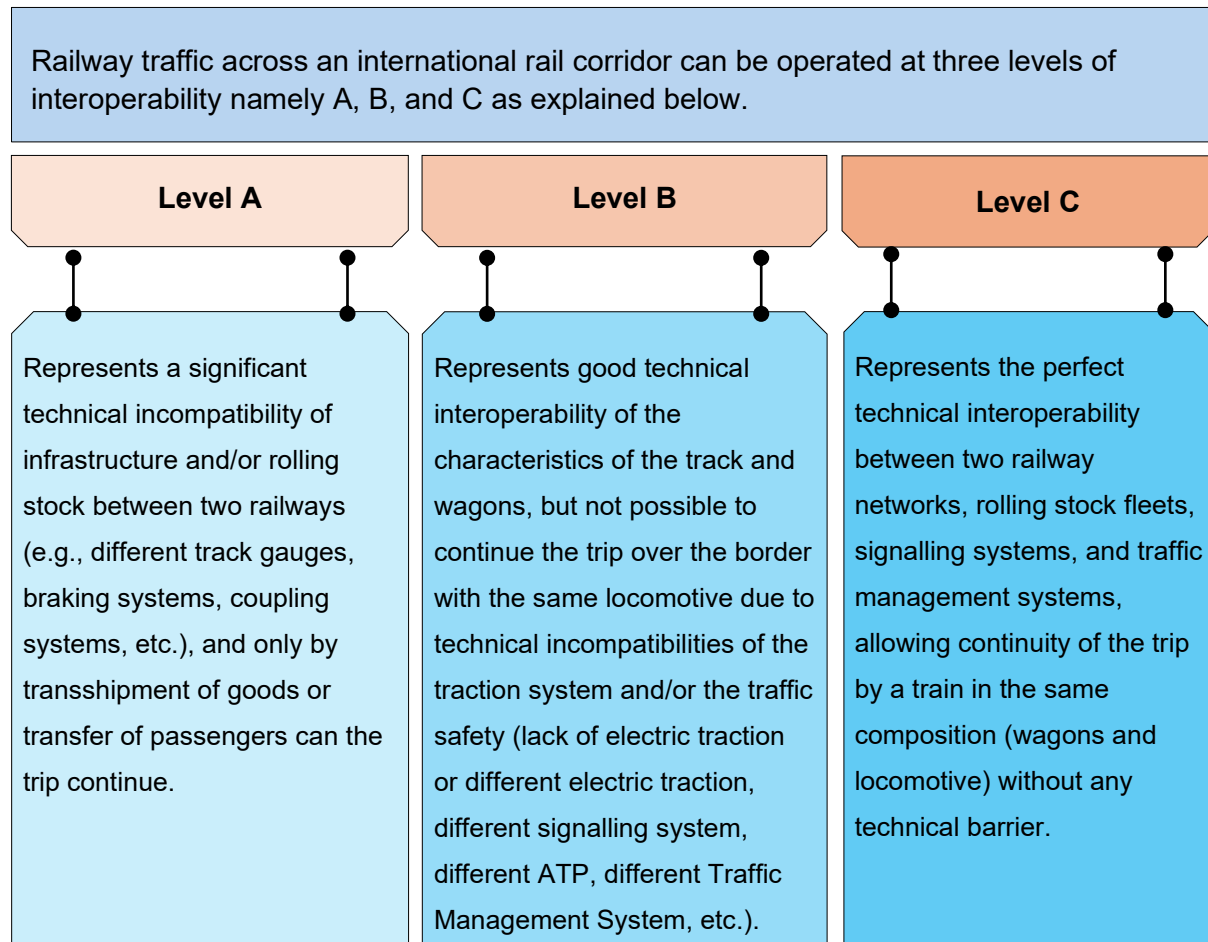
Action 1

Take stock of current levels and agree on a mechanism to establish targets for rail interoperability and mode of rail border crossings among ASEAN Member States

Implementation Pathway Action 1:

- ❖ The Action 1 implementation entails mapping the current and predicted (future) levels of interoperability and mode of rail border crossings among AMS through appropriate mechanism.
- ❖ This needs discussion between relevant AMS with their neighbour(s) with which it shares rail border crossing and consensus, on the desired/ level interoperability and mode of rail border crossing and agree on a timeline to achieve the desired levels.
- ❖ Subject to availability of resources and a request from ASEAN secretariat and/ or AMS, ESCAP can organise background study on this and facilitate expert discussions, negotiations and consultations on the current and desired levels of rail interoperability and on the mode of rail border crossings.

2. Addressing technical rail interoperability



For each of these levels of interoperability, there are technical parameters that need to harmonise before traffic at that level can be contemplated. The technical parameters for each level of interoperability can be grouped into two categories:

- specific to infrastructure
- specific to rolling stock

The values for all parameters below are recommended to be agreed upon separately for metre gauge lines and standard gauge lines. For realising level C all the parameters for B must be compatible and in addition following parameters also need consideration.

The technical parameters for rail infrastructure for Level B rail interoperability include:	The technical parameters for rail rolling stock for Level B rail interoperability include:
• Axle Load • Structure gauge • Passing siding length • Platform length • Platform height • Platform width • Smart infrastructure	• Loading Gauge • Maximum train length • Coupling systems • Brake Gear • Smart rolling stock
Additional technical parameters for rail infrastructure for Level C rail interoperability	Additional technical parameters for rolling stock for Level C rail interoperability
• Signalling system • Automatic train protection (Wayside Equipment) • Traffic management • Telecommunication technologies • Traction system	• Types of locomotives/train set • Locomotive/train set traction power • Maximum speed • Automatic train protection (on board equipment)

It also needs to be underscored that higher interoperability involves trade-off between costs and benefits. The higher the level of interoperability, the more will be the costs involved and the closer will be cooperation required from participating ASEAN Member States to implement those levels of interoperability. Given the complexity of issues involved in moving towards higher interoperability levels namely level B and more so for level C, the move need to be gradual and appropriately coordinated.

Therefore, it is recommended to constitute a Task Team on Railway Interoperability (TTRI), whose members are nominated experts designated by ASEAN Member States. Working under the coordination of the ARSWG, the TTRI will address priority and urgent issues related to railway interoperability to support the development of an integrated ASEAN rail network.

Its terms of reference could include such issues as technical interoperability: assessing the current and target level of interoperability and mode of border crossing at each border point.

On operational interoperability, building consensus on key operational parameters for operating trains and their values (e.g., train tonnage, train composition, speed of the train, traffic management, asset maintenance rules, the traffic safety, etc.) for the identified railway corridors.

Action 2

Use the platform of ASEAN transport sectoral bodies consisting of nominated rail experts from relevant ASEAN railway agencies to identify technical parameters to be standardised/ harmonised for agreed level of interoperability and develop action plans/agreements as needed for their implementation

Implementation Pathway Action 2:

- ❖ For implementing this action, the AMS can use the existing platform of ASEAN transport sectoral bodies.
- ❖ TTRI meetings may be held alongside meeting of the ARSWG or as needed to address technical, operational, legal, and interoperability issues.
- ❖ At AMS request and subject to resources, ESCAP can support TTRI through studies, expertise, and field visits.

3. Ensuring legal rail interoperability

In international transportation services, railways need a common legal framework to define:

- The relationships with the customers of railways
- The mutual relationships with other the railway operators involved in international transport

Relationships with the customers

The relationships of railways with the customers are defined by a contract between a specific customer and the railway company initiating the transport process:

For passenger transport:
the customer buys a ticket
representing the contract with
the railway operator carrying
the customer

For freight transport:
the customer signs a contract
of transport (consignment
note) with the railway
operator carrying the goods

The passenger ticket or the freight contract of transport is issued by the railway company operating at the trip's point of origin (expedition). Still, these documents must be valid up to the destination, no matter how many railway companies operate the transport.

For example, for a freight expedition on the central route of SKRL from Kunming (China) to Malaysia, railway companies from China, Lao PDR, Thailand, and Malaysia are involved from origin to destination. All railway operators engaged in providing that transport service along the route must follow same rules and accept the same responsibilities vis-à-vis the customer, as written in the signed transport contract with the railway of origin (in this case, the Chinese Railway Operator).

Similarly, a passenger buying an international ticket must be protected by the same contractual clauses throughout the entire trip up to the destination, no matter how many railway companies are involved in the transport.

In all cases of international transport, when more railway operators oversee the execution of transport services, the responsibilities must be transmitted from one railway operator to another. The duties to be followed by railway operators involved in international transport include:

- A single form of the contract of transport
- Compensation of customer in case of loss
- Liability for waste in transit
- Compensation for damage
- Compensation for exceeding the transit period
- Liability in case of death, or personal injury, to passengers
- Liability in cancellation, late running of trains, or missed connections

Relationships between the railways involved in international transport

To be able to follow uniform responsibilities vis-à-vis the customers, the railway companies involved in international transport across the rail network must agree on common procedures and rules of cooperation, as the following:

- Settlement of accounts for freight transport
- Apportionment of the carriage charge for passenger transport
- Right of recourse in case of payment of compensations for another carrier who produced a loss or damage
- Liability in case of loss of or damage to a wagon/coach belonging to another carrier
- Addressing the defective wagons/coaches on networks of other carriers

International Conventions for Railway Transport

Presently, there are two international rail organisations, OSJD and OTIF, which have put in place legal regimes to comprehensively address the issues presented above for international railway transport. The two organisations cover different regions of the world but cooperate in facilitating international transport. The two organisations defined uniform rules concerning the obligation of the carrier to transport the goods for reward to the place of destination.

The international conventions for rail transport include provisions for unique consignment note to destination, payment and costs, loading and unloading responsibilities, delivery of goods at destination, liabilities for loss or damage of goods, settlement of accounts between carriers (railway operators involved in the transport), liabilities in case of loss or damage of wagons.

The neighbouring railway operators belonging to the same organisation (OTIF or OSJD) use the same consignment note in international traffic, and all responsibilities and liabilities are commonly accepted by those railways.

At the border crossing between two railway operators belonging to two different organisations (OTIF and OSJD), the transcription of documents in the form that is acceptable to the receiving railway operator is necessary. OTIF and OSJD cooperate tightly, and they agreed upon a common CIM/SMGS consignment note currently in use on some international corridors; it has the scope to put in place a single legal regime from the Atlantic to the Pacific.

Table 1: OSJD and OTIF membership of ASEAN Member States and China

No.	Country	Member of International Rail Convention	
		OSJD	OTIF
1	Cambodia	No	No
2	China	Yes	No
3	Indonesia	No	No
4	Lao People's Dem. Rep	Yes	No
5	Malaysia	No	No
6	Myanmar	No	No
7	Singapore	No	No
8	Thailand	No	No
9	Viet Nam	Yes	No
10	Brunei Darussalam	No	No
11	Philippines	No	No

The common consignment note helps to avoid the reissuing of transport documents and, in doing so, simplifies customs clearance.

The common CIM/SMGS consignment note considerably increases the competitiveness of rail freight transportation. The CIM/SMGS consignment note is a generally paper based but attempts to issue in an electronic equivalent are also being considered so that it can be transmitted to authorities and other transport parties before the train arrives. The CIM/SMGS consignment note can be incorporated into digital solutions for international traffic management.

Joining one of the existing international railway conventions appears most appropriate way for the ASEAN railway operators to address the legal issues of international rail transport across the region and in relationships with the rest of Asia and Europe. Currently, only Lao People's Democratic Republic and Viet Nam are members of the OSJD. The rest of the ASEAN Member States are not member of any railway international organisation.

Table includes China (not a member of ASEAN), considering that the Chinese Railway system is the only point of connection of the ASEAN rail network with the rest of the railways in the world.

The data presented in Table 1 above suggests that the appropriate decision for the smooth development of international transport for ASEAN Member States would be to join OSJD. The decision is crucial for legal interoperability, but each ASEAN Member State must decide based on its own analysis.

Action 3

Consider joining the relevant rail organisations with the aim to harmonise the rail consignment note among ASEAN Member States aligning it with international good practice(s).

Implementation Pathway Action 3:

- ❖ Consignment Note is important document in international railway transport so far as it sets contractual relationship between the railway company/operator and the customer.
- ❖ On international rail corridor, legal interoperability is achieved when contractual relationships are harmonised across the countries.
- ❖ The Organisation for Cooperation between Railways (OSJD) provides such an arrangement and therefore AMS, that are currently not its member may consider joining this organisation.
- ❖ In addition, Intergovernmental Organisation for International Carriage by Rail (OTIF) is another rail organisation that provides rules and regulations on many aspects of international rail transport.
- ❖ ESCAP, subject to availability of resources, can facilitate discussions between these railway organisation and AMS as well as organise workshops/seminars for better understanding of OSJD and OTIF instruments that facilitate international railway transport.

4. Promoting electronic information exchange among railways and between railways and customs for efficient rail border crossing formalities

Inordinate delays at the railway border crossings reduce competitiveness of rail transport and therefore it is imperative to streamline border crossing formalities to increase reliability of rail services. Currently, most ASEAN Member States rely on paper-based documents to complete the border crossing formalities and as rail traffic increases this could become a choke point for rail traffic as paper-based formalities are generally inefficient. However, challenges in streamlining of customs formalities for rail are multifaceted, ranging from fragmented legal arrangements to paper-based information exchanges between stakeholders.

On top of that, regulatory compliance requirements differ between countries and there is lack of mutual recognition of control measures and joint control arrangements. Due to these challenges and despite rail is more secure, energy efficient and environmentally friendly form of transport than road, rail is not utilised to its full potential among ASEAN Member States.

Streamlining border crossing formalities for rail cargo affords numerous benefits to customs authorities, railway operators and their customers. It can significantly reduce transit times for rail cargo, enabling railway operators to increase the frequency of their service and decrease door-to-door delivery time for their customers.

From operational perspective, the absence of electronic information exchange between railway and customs authorities inhibits the implementation of automated risk management system, which are essential for minimising physical inspections of goods. Establishing such electronic information exchange between railways and controlling agencies, e.g., Customs and other government agencies, could help streamline border crossing formalities for international rail transport, thereby reducing time and cost, as well as reducing customs guarantee requirements.

ESCAP together with OSJD, developed a joint document entitled [Digitalisation- next steps for future international railway traffic](#). The document elaborates on the potential of electronic information exchange to streamline customs formalities in international railway transport.

ASEAN Member States could start working on solutions that promote electronic information exchange among railways and between railways and customs to complete regulatory formalities and operational requirements in international rail transport. Given the increasing importance of this issue, the Working Group on Trans-Asian Railway at its eighth meeting held in 2023 adopted a new annex to the intergovernmental agreement on Trans-Asian Railway on this matter.

The new annex containing guiding principles on electronic information exchange among railways and between railways and customs provides an overarching framework for countries to cooperate in developing seamless electronic information exchange practices along railway corridors.

Introduction of digital declaration and automated declaration processing can reduce the cost of compliance. Furthermore, it can help improve the reliability of rail services. Customs authorities can have access to reliable (automatically collected by the system) real time data about rail cargo, its status and location via dedicated online portal, enabling automated risk management and immediate action whenever necessary.

Streamlined border crossing formalities enable railway operators provide more consistent and predictable services to their customers, which helps build trust and loyalty. It would help rail to become more competitive and increase its modal share while increasing trade volumes and promoting economic integration and contributing to the ASEAN Economic Community (AEC) goals.

In recent years, the implementation of digital solutions by ASEAN Customs authorities has been accelerated due to the increasing demand for efficient and cost-effective transport services. The AMS have adopted various measures to facilitate intra-ASEAN trade, one of them is the ASEAN Customs Transit System (ACTS) – a successful case of harmonisation and digitisation of customs clearance formalities.

ACTS is based on the EU's best practice New Computerised Transit System (NCTS), which is mandatory for transit of goods in the EU and EFTA countries since 1st of July 2005. ACTS introduced single regional digital customs declaration, semi-automated and fully automated customs clearance procedures, suspension of duties and taxes and regional guarantee system for duties and taxes at risk during the transit journey.

Since ASEAN Member States are already implementing ASEAN Customs Transit System (ACTS) in road transport, it would be desirable to explore possibility of expanding it to rail. Streamlining customs formalities using ASEAN Customs Transit System (ACTS) would enhance operational interoperability among border agencies.

To adopt rail-based transit in ACTS requires a step-by-step approach. For the gradual shift towards digitally facilitated rail border crossing customs formalities using ACTS, the following step could be taken:

- **Assessing Current Processes and Practices**

Assess the current processes for rail border crossing customs formalities in AMS to map the data exchanged between railway, Customs and other border control authorities whether it is on paper or electronic. Map out the currently available electronic data exchange, such as CIM/SMGS consignment note, NCTS phase 5 transit declaration, and ACTS transit declaration, to identify common data elements and gaps.

- **Identifying and specifying changes required in the digital platform**

Detailed analysis of the changes required in the ACTS to implement and operationalise automated and simplified rail-based customs transit procedures, including specific changes in and additions to:

- Business process of ACTS
- Data model (electronic messages) of ACTS
- Supporting subsystems of ACTS, such as trader repository (TR), guarantee management system (GMS), reference data system (RDS), and user management system (UMS)

- **Updating the digital platform**

Design and develop the changes specified during the analysis of the changes required in ACTS

- **Training and capacity building**

Provide training and capacity building for customs authorities, transport authorities, railway operators, multimodal transport operators (MTO) and other relevant stakeholders on the use of the newly updated ACTS and associated manual procedures including:

- Develop procedural manuals for railway operators and MTO to be aligned to newly redesigned ACTS business processes and data model
- Update procedural manuals for Customs and Transport authorities in alignment to newly redesigned ACTS business processes and data model

- **Piloting the digital platform and manual procedures**

Implement a pilot project to test the newly updated ACTS in select AMS and gather feedback from customs, railway operators, MTO and other relevant stakeholders. The pilot project could be arranged along the Malaysia-Thailand-Lao PDR corridor, subject to relevant ASEAN decisions, and could include both pure rail-based movements of goods and movements of goods using multimodal transport by road and rail.

- **Gradual roll-out**

Based on the results of the pilot project, gradually roll out new version of ACTS to the relevant participating AMS, with a phased approach based on readiness of railway networks and willingness and capacity to implement the new regime.

- **Monitoring and evaluation**

Establish a monitoring and evaluation framework to track the progress of the digitalisation of rail border crossing customs formalities and adjust as needed.

- **Continuous support to live operations**

Engage in extensive and continuous outreach to private sector to increase the uptake of newly available transit scenarios. Provide comprehensive helpdesk support for all stakeholders using the system.

Action 4

Promote electronic information exchange among railway operators and between railway operators and customs authorities for streamlining and harmonising customs formalities including by using ASEAN Customs Transit System (ACTS)

Implementation Pathway Action 4:

- ❖ The implementation of this action entails two parallel steps, first, to promote electronic information exchange between railways of AMS, and second, among railways and customs.
- ❖ In this regard, the AMS, that are contracting parties to the intergovernmental agreement on Trans-Asian railway network should consider acceptance of new annex that provides for guiding principles on electronic information exchange among railway stakeholders.
- ❖ Moreover, the action would need proactive measures from AMS- as it involves engaging Customs authorities to streamline and harmonise customs formalities for international rail transport.
- ❖ Relevant ASEAN technical working groups related to customs and transport should continue efforts aimed at adopting ACTS for rail with the support of development partners and relevant international organisations as required.

5. Set up an institutional mechanism to support higher levels of rail interoperability among ASEAN Member States

ASEAN Member States have a significant advantage over other countries in Asia in developing an integrated, interoperable railway network. The existence of the ASEAN organisation with well-structured sectoral bodies and the political will has been facilitating effective decision-making. It can provide strong institutional basis to the initiatives required for achieving integrated railway system among ASEAN Member States.

ASEAN Member States have already started to finance construction/renewal and modernisation of various segments of their rail network. While doing so, the risks of unwittingly creating barriers to rail interoperability are real. To manage development

of the rail network among ASEAN Member States, need for an institution focused on elaborating and implementing uniform legal, technical, and operational frameworks for railway transport is apparent. Such mechanism can ensure that the rail network in ASEAN Member States is developed gradually to attain higher levels of interoperability.

ASEAN Member States have already set up a railway sub-working group to serve as coordination mechanism for enhanced cooperation on rail matters. It could add to its agenda to set up a task force to address the rail interoperability step-by-step, starting with the urgent technical interoperability issues and slowly increasing its remit as per the needs of railways.

In parallel, the ASEAN Railway Sub-Working Group (ARSWG) can prepare a larger political commitment to creating a dedicated ASEAN body to address rail interoperability issues. In this direction, the ASEAN Member States can learn from the experience of the European Union (EU) in harmonising rules and regulations for developing an integrated railway system across different countries.

In 2004 the Member States of the EU agreed to create European Union Agency for Railway (ERA), which started its activities in 2006 with overarching objective to improve rail competitiveness through higher rail interoperability of railway systems and pursuing a common approach to rail safety. ERA works cooperatively with railway stakeholders to develop economically viable common technical standards and safety measures.

ERA has advanced a uniform European signalling system (ERTMS) by developing TSIs for control, command, and signalling, alongside the necessary legislation. It has promoted efficient rail freight through digital logistics tools like route optimisation and load consolidation. Since 2019, ERA's one-stop shop has managed all applications for single safety certificates, vehicle authorisations, and ERTMS trackside approvals.

As is evident the constitution of ERA has been instrumental in promoting integration of European Railways leading to higher rail interoperability. Over the period of twenty years of its existence its activities have increased manifold.

The ASEAN Member States could consider establishing a similar agency as a dedicated entity for achieving a seamless, interoperable, and safe railway network among ASEAN Member States.

The Task Team for Rail Interoperability as envisaged under action 5 or another Task Team on developing institutional mechanism for rail interoperability could be constituted for taking necessary steps at ASEAN and national levels including:

- Agree on the necessity to establish ASEAN Rail Agency (ARA) or similar mechanism for addressing all issues related to the development of a safe, interoperable railway transport system among ASEAN Member States.
- Establish cooperation with the European Union – Agency for Railways and learn from their experience in rail interoperability and how it could be beneficial for AMS
- Elaborate on the legal framework for the creation of the new mechanism and getting the agreement from all involved ASEAN Member States
- Define the main functions of the new mechanism including in the fields of technical interoperability, safety certification, achieving convergence of national safety and operating rules of the ASEAN Member States
- Expand the organisational structure and financing option for the new mechanism
- Develop an action plan elaborating steps that gradually establishes the mechanism to function as an independent institution

Action 5

Develop an appropriate mechanism to foster deeper cooperation among railway agencies of AMS to address rail interoperability issue on continuing basis

Implementation Pathway Action 5:

- ❖ The implementation plan is embedded in the action itself and essentially entails AMS agreeing on a need for such a mechanism that can foster deeper cooperation among AMS on rail interoperability on continuing basis.
- ❖ As an initial step an ASEAN Center for Excellence in Rail can be set up to deliberate on these issues. Subsequently depending on needs of AMS, it will be desirable to coordinate with international organisations, particularly, European Union Agency for Rail to tap their expertise in setting up similar mechanism for ASEAN.

- ❖ The name, functions, organisational structure as well as funding of the new cooperation mechanism should be extensively deliberated among the AMS to ensure while they benefit from outside experience, the mechanism and its modalities are suited for and meets the needs of AMS in developing safe and interoperable rail system.

6. Deepening rail digitalisation among ASEAN Member States

Rail transport is experiencing a tidal wave of digital transformation driven by emerging digital technologies like artificial intelligence, fifth generation (5G) mobile technology, big data, cloud computing, the Internet of things, automation and blockchain. These new technologies can provide numerous benefits to augment rail competitiveness by enhancing operational efficiency, lowering energy intensity, enriching customer experience, and integrating seamlessly with other modes of transport.

The resilience shown by rail transport during the coronavirus disease (COVID-19) pandemic has provided additional impetus to digitalise rail and harness its numerous benefits. Improvements in the competitiveness of rail transport due to digitalisation would afford opportunities for increasing the freight transported by rail and pave the way for more sustainable freight transport to support the realisation of the Sustainable Development Goals.

Harnessing the opportunities arising from rail digitalisation, however, present considerable challenges given the differences in the status of rail development in ASEAN Member States. There are also considerable disparities in terms of research and innovation, digital skills and financial investments in rail digital infrastructure that need to be addressed.

At the eighth meeting of the Working Group on Trans-Asian Railway that took place in 2023, a Pacific was adopted by members of the Working Group. The Strategy 2030 comprises a guiding vision, six objectives, eight priority areas and five enablers, as well as implementing arrangements, including for measuring progress in rail digitalisation.

Digitalisation is no longer regarded as an optional measure but rather as a prerequisite for ensuring the competitiveness of rail transport. While some of the advantages of rail digitalisation is easily comprehensible, fully harnessing its benefits requires the implementation of comprehensive, sustained and coordinated measures at national and subregional levels.

The ASEAN Member States have the unique opportunity to develop a digital rail network as most investment in ASEAN rail is still being undertaken. It would be desirable that rail policy makers in ASEAN study various rail digital solutions and tools which could then be tailored to their unique requirements. Significant developments are underway in digital rail communication where the GSM-R based on 2G

technologies is heading towards obsolescence. Railway policy makers in ASEAN need to be aware of emerging technologies, including their advantages and disadvantages. UIC is developing a future rail mobile communication system (FRMS) being that is 5G compatible.

Similarly other communication technologies such as LTE-R are also being used extensively to meet the needs of digital rail. In addition, digital rail asset management provides opportunities for the increase asset utilisation by shifting from preventive to predictive maintenance practices.

There exists potential for rail managers in ASEAN to learn from good practices in this area. Equally important are developments in digital signalling that ASEAN railways need to be aware as they increase rail traffic on their networks.

Rail digitalisation would also need stronger cooperation among ASEAN Member States to address emerging from cyber threats.

The need for investment in digital assets would require more funding and ASEAN railways should explore all available funding sources including those available from multilateral agencies as the state funding would remain constrained.

In addition, railway personnel would require improved digital competencies to effectively operationalise digital rail operations. To support this, it is recommended that ASEAN Member States develop a region-wide ASEAN Rail Digitalisation Program (ARDP) that would enhance rail competitiveness and achieving the necessary levels of rail interoperability.

The ARDP should be developed jointly by ASEAN Member States and based on the Strategy 2030 on Accelerating Rail Digital Transformation in Asia-Pacific, with customisation to the needs and priorities of the ASEAN railways.

Action 6

Develop an ASEAN Rail Digitalisation Program (ARDP) to support rail interoperability at all levels

Implementation Pathway Action 6:

- ❖ ESCAP can help AMS and ASEAN in developing the ASEAN rail digitalisation program due to its extensive work in rail digitalisation. ESCAP members adopted the Strategy 2030 on Accelerating Rail Digital Transformation in Asia-Pacific region that has six objectives, eight priority areas and five enablers.

- ❖ The strategy also calls for developing subregional rail digitalisation strategies/plans to meet the specific needs of the countries. On request from AMS and/or ASEAN Secretariat, ESCAP could launch a dedicated project for developing an ASEAN rail digitalisation programme/plan.
- ❖ It would be developed through a bottom-up approach to have a better understanding of priorities and needs of rail digitalisation among AMS. The plan would aim to ensure that digitalisation acts as a leverage for enhancing rail competitiveness and encouraging modal shift in AMS.

7. Consider establishing a rail corridor management mechanism

Leveraging full benefits of Lao-China railway would need additional efforts by participating countries to shift international traffic to rail by formulating and implementing proactive policies. Rail managers need to be more innovative in addressing market needs and promoting door-to-door services.

Global experience shows that cross-border rail operations need closer cooperation and a transnational body to handle issues like customs, tariffs, and service marketing. An example is UTLC ERA, which offers integrated transport and logistics services via regular container trains along the Eurasian Rail corridor linking Kazakhstan, Russia, and Belarus. As per information available on its website: UTLC was registered by the Russian, Belarusian, and Kazakhstan National Railways on November 13, 2014.

The company was established to develop the transit potential and to increase traffic volumes along the East-West axis using the railway networks of the member countries by implementing high-tech logistics services that require an aligned policy to be adopted by railways and regulatory authorities in the 1,520 mm gauge territory².

Its services include provision of uniform rail tariffs, handling operations, and customs formalities. The company is owned jointly by railway operators of the three EAEU countries and acts to the interest of the rail corridor by providing dedicated services. Its efforts have led to continuous increase in traffic and reduction in time for transport along the rail corridor.

Corridor approach to facilitation of international railway transport was also identified as one of the areas for cooperation among member countries in the Regional Cooperation Framework for Facilitation of International Railway Transport that adopted in 2015 by an ESCAP resolution 71/7³.

² <https://www.utlc.com/en/about/>

³ <https://www.unescap.org/resources/regional-cooperation-framework-facilitation-international-railway-transport>

It alluded to various rail corridors identified by many organisations including the Economic Cooperation Organisation, the Organisation for Cooperation Between the Railways and the European Commission.

The efficient operation of international rail traffic enhanced coordination among involved stakeholders. To achieve these and to begin with, Malaysia, Thailand, and Lao PDR may consider establishing a rail corridor management mechanism for better coordination in improving cross-border railway operation of the railway corridor linking these countries. At a later stage, it may also consider options for other interested ASEAN Member States to join.

The management structure for the rail corridor must facilitate the cooperation among the countries on multiple issues including setting the goals for the development of infrastructure and of operations on the rail corridor as well as developing specific action plans on various aspects of interoperability or operation performance including measuring the results.

The current conditions in ASEAN railways require flexible adapted management structure to attain objectives of competitive rail transport in a more diverse legal, technical, and operational environment.

The first step for establishing a corridor management mechanism for the rail corridor will be developing and signing a memorandum of understanding to affirm political commitment and provide institutional basis for cooperation among countries.

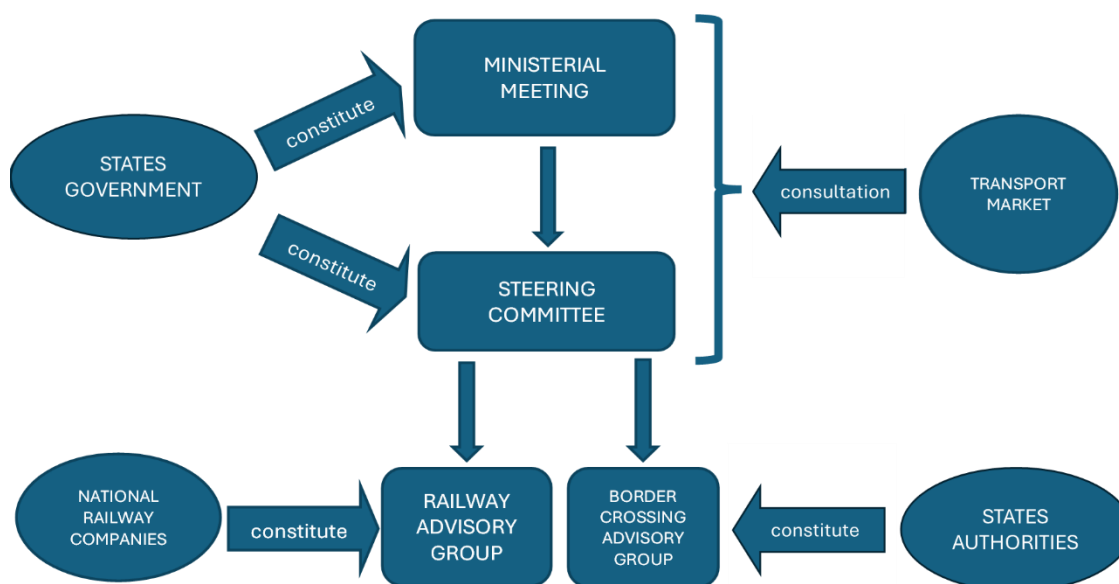
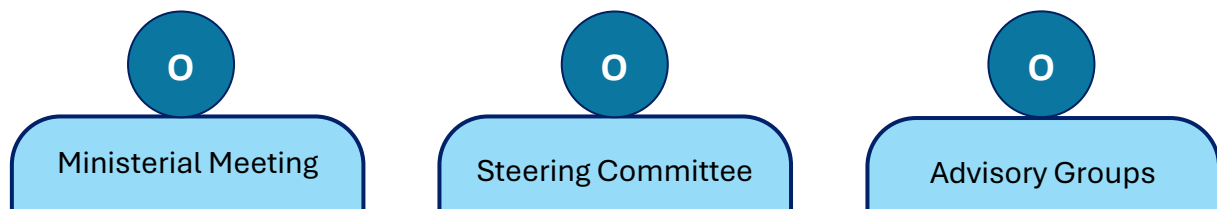


Figure 5: Proposed structure on corridor management mechanism

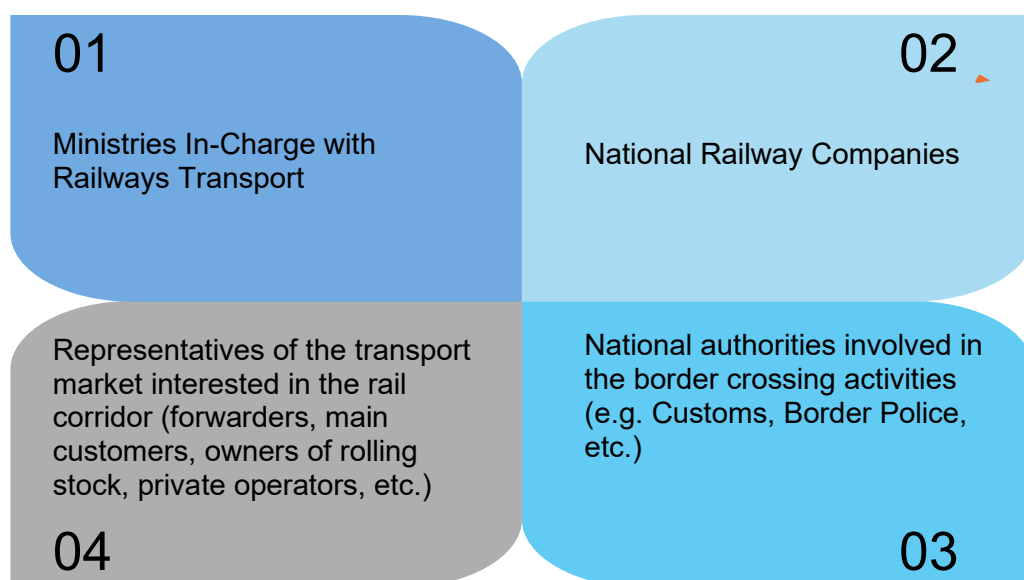
While encouraging cooperation, it is vital to preserve the independence of the countries in adopting the decisions related with the development of the rail corridor. This entails that: all decisions are taken by consensus, and all provisions of the MoU

are without prejudice to the competence of the States regarding the organisation of the railway transport services on their territory.

The governance of the rail corridor requires a clear and transparent management structure accepted by the countries. This document proposes a management structure based on three hierarchical levels:



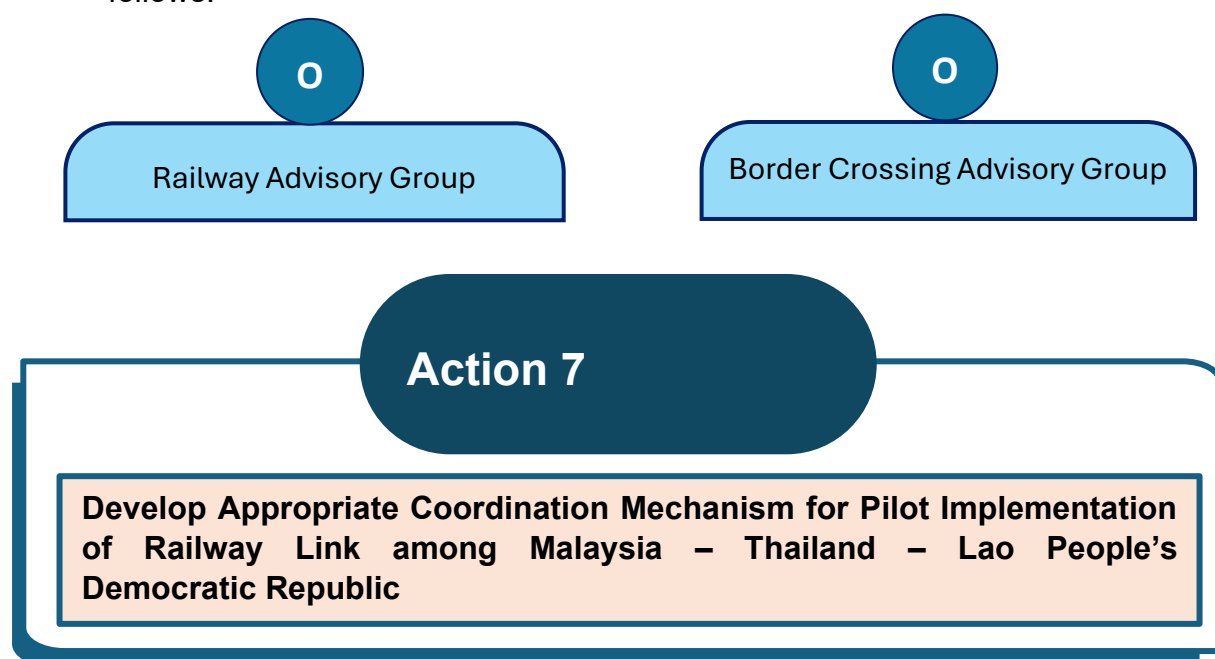
The proposed management structure of the rail corridor would be populated with appointed representatives from various entities of the three countries, as follows:



The rules for organisation and the attributes for each of the management layers of the rail corridor must be approved by the ministerial meeting. The following paragraphs summarise the main attributes of each of the management layers of the rail corridor.

- The Ministerial Meeting represents the highest authority in the management structure of the rail corridor. It is composed of the ministers in charge with the railway transport coordination in the countries and is chaired by one of the ministers by rotation every two years.
- The ministerial meetings take place annually to discuss and approve all major decisions related with the realisation and operation of the corridor.

- The Steering Committee of the rail corridor is the executive body of the ministerial meeting. In the interval of time between two consecutive ministerial meetings, the steering committee is fully in charge of the management of the activities on the rail corridor.
- The steering committee will coordinate all activities according with the mandate received from the Ministerial Meeting. It will supervise the activities of the Advisory Groups created to provide the professional support for the development of solutions to the specific issues related with the operation of traffic along the rail corridor.
- The Advisory Groups are ad-hoc structures created on voluntary commitment of the countries for addressing specific issues which require professional expertise.
- The steering committee has the decision power to recommend the creation of as many advisory groups as necessary for the resolution of the urgent tasks agreed on the annual action plan for the implementation of the rail corridor.
- Two advisory groups are recommended to be created at the initial stage of implementing the proposed management structure of the rail corridor, as follows:



Implementation Pathway Action 7:

- ❖ The implementation of this action can be supported by ESCAP based on its previous work with its member countries in establishing rail corridor management mechanism.
- ❖ Rail corridor mechanism will bring focus on the needs of the corridor including both hard and soft components as well as promoting and marketing the rail corridor to shippers.

- ❖ On the request from the AMS countries, this activity can be planned and will include undertaking a background study, documenting good practices, and a draft mechanism.
- ❖ The draft mechanism can then be negotiated by the AMS and finalised by organising a series of negotiating meetings facilitated by ESCAP.

8. Supportive legal and regulatory frameworks at national level to support rail interoperability

The draft mechanism can then be negotiated by the AMS and finalised by organising a series of negotiating meetings facilitated by ESCAP.

While ASEAN Member States may structure their railway transport markets according to their national agenda, the development of international railway transport requires compatible legal and regulatory frameworks across countries. Without such alignment, achieving higher levels of rail interoperability becomes difficult. Establishing these frameworks is a very important step, the next step involves engaging with the neighbouring countries to harmonise national strategies. Without coordination, misaligned strategies between neighbouring countries will hinder efforts to improve interoperability across the ASEAN region.

The legal and regulatory aspects that need to be considered, include following main aspects:

- Comprehensive review of existing national railway laws and regulations and amend them
 - a) to support the agreed interoperability targets for compatibility of rail infrastructure and rolling stock (list of agreed technical parameters); and
 - b) to streamline and harmonise procedures involving customs, freight, and passenger processes to reduce delays in international railway traffic.
- Develop processes for the licensing and certification of railway companies and of personnel hired on critical positions requiring safety (e.g., locomotive driver, traffic dispatcher, etc.) and make efforts to align such licensing and certification.
- Establish supportive national regulations that promote public-private partnerships in the rail sector, enabling the mobilisation of private sector expertise and resources to enhance rail interoperability.

In addition, the national legal and regulatory framework for rail should encourage the inclusion of good management practices of the rail sector, such as:

- Allow flexibility in setting up tariffs in consultation with relevant stakeholders for international expeditions, to achieve the necessary competitiveness on the market along the entire railway corridor.
- Improve safety management systems for railways (licensing of railway operators, safety certification, accident investigation).
- Establish clear governmental responsibilities for addressing the railway transport agenda and allocate adequate resources for financing the railway infrastructure and the social services for the transport of passengers by rail.
- Adopt compatible regulations on the rights of railway operators.
- Set up a national investigation body, railway regulator, and multi-ministerial group to facilitate cross-border and international railway traffic.

The scope of all legislative actions should be to implement the agreed levels of interoperability. Across an international route, it is possible to reach different levels of interoperability (LEVELS A, B, or C), depending on the political and economic relations between the neighbouring countries.

Action 8

Put in place a compatible regional as well as national legal and regulatory framework for the rail to support the agreed level of interoperability

Implementation Pathway Action 8:

- ❖ The implementation of this action is related to future levels of interoperability as agreed under Action 1.
- ❖ The regional as well as national legal and regulatory frameworks need to support the agreed levels of interoperability. For example, to achieve interoperability level C, the national legislation should support common technical specifications related to interoperability for rail infrastructure and rolling stock as indicated under Action 2.
- ❖ Similarly, if mode 2 of rail border crossing is agreed among countries, then the regulatory framework of the border agencies should allow them to execute controls in the customs territory of the neighbouring country.
- ❖ Under mode 3, border crossing controls are done at only at origin and destination and not all the border crossings are involved. Accordingly, the national legal and

regulatory frameworks of border agencies should support actions required for mode 3 border crossing.

- ❖ Moreover, for higher levels of interoperability, these frameworks should be compatible among the countries to achieve that level of interoperability.

9. Existence of different railway gauges in ASEAN Member States

The railway gauge is one of the most critical components of the technical interoperability of railways in the ASEAN region. When an international railway corridor comprises railway lines of different gauges, there is a severe challenge to the interoperability at the interconnection of two different gauge lines.

The traffic is fragmented at that point, and the train cannot continue its trip smoothly on the railway lines of a different gauge. Interconnecting different gauge lines requires equipment for handling the transshipment and generating additional costs in the transport process.

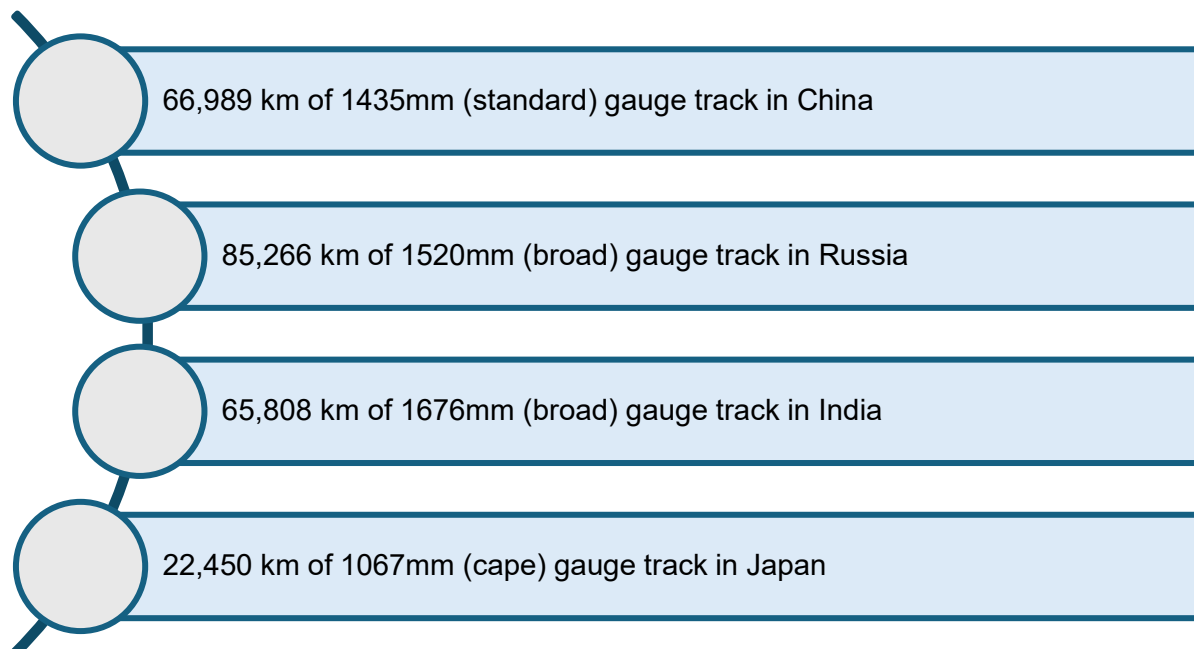
The rail network in ASEAN Member States is mainly composed of metre gauge lines with some standard gauge line in operation, notably the Lao-China line, and others either under construction or in design stage.

For ASEAN Member States in the mainland, rail operations along international rail corridors require creating interface with Chinese rail network which has a standard gauge network. Broadly there are four dominant track gauges around the World:



The standard gauge is used by about 55 per cent of the existing railways worldwide, while the broad gauge represents about 33 per cent, and the narrow gauge (cape+meter) represents about 12 per cent. In many cases, in the same region of the world or even in the same country, lines of different gauges have been built. For example, in Asia, there are, in total, five different railway gauges.

Four of the most important railways in the world are in Asia and own extended railway networks of different gauges:



ASEAN Member States have about 22,000 km of metre gauge and cape gauge railway lines. Although the standard gauge may have some advantages, like a larger market of suppliers of rolling stock and other assets, it is relevant to highlight that the railway gauge should not be considered as a barrier to the higher efficiency of railways.

Replacing the narrow-gauge lines with a new standard gauge will not by itself

- (a) increase the volumes of freight or passengers transported,
- (b) enhance the productivity of the staff and assets of railways, nor
- (c) decrease the cost of transport.

The narrow-gauge lines are not a handicap for providing efficient railway transport services. They can perform high capacity and fast operations when well operated. In some countries, high volumes are operated annually on the narrow (cape or metre) gauge lines: Japan, Taiwan, New Zealand, South Africa, and Australia. The analysis of rail network in ASEAN Member States show that the transport services shall be operated on different railway gauges (standard and metre) for many years ahead.

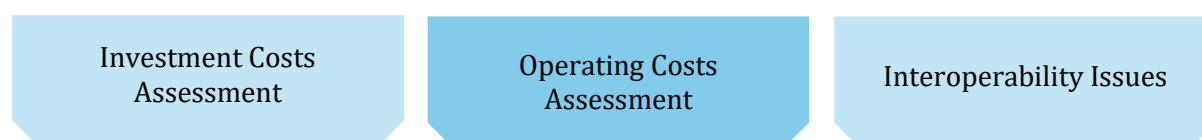
The international freight traffic will be mainly operated on the existing metre gauge lines, which will be doubled on many network segments, providing for higher transport capacity.

The passenger traffic will be operated on conventional standard gauge (Kunming-Vientiane, or future connections of Kunming with Hanoi and Mandalay), on standard gauge lines (in Thailand) and on existing metre gauge lines on all the remaining ASEAN Member States.

For evaluating the opportunity of decisions taken on track gauges, a detailed analysis of traffic volumes on each route is necessary, both for domestic and international flows of freight and passengers in the countries.

This analysis highlights the necessity of an in-depth assessment of decisions on future track gauge, due to coexistence of two gauges and two fleets of rolling stock. This assessment must consider the costs to budgets (capital and operational expenditure) vis-à-vis benefits. The final goal of the ASEAN Member States is to develop a functional and efficient railway network. Building railway infrastructure is not a goal in itself, whereas the goal is to achieve efficient and competitive railway transport services.

The three major aspects to consider when assessing the opportunity to build standard gauge lines are:



As stated above, the metre gauge can achieve comparable results in the operation of transport services. It is essential to assess when it is a good decision to build new lines with a standard gauge or to replace existing lines using the standard gauge.

In this analysis, the ASEAN Member States must pragmatically follow their economic development goals and carefully evaluate any investment decision in building new railway infrastructure, considering the economic and social impact of such decision on national and regional levels. Accordingly recommended action as follows:

Action 9

Decide track gauge issues on case-by-case basis after thorough consideration of comprehensive economic, social and environment impact assessment at both national and regional level, including considerations for rail interoperability

Implementation Pathway Action 9:

- ❖ Action 9 needs to be implemented by each AMS on case-by-case basis considering the multiple issues holistically to support the agreed levels of interoperability.
- ❖ As elaborated in the action, together with economic, social and environmental impact assessment, it would be important to consider the implications at the regional (Asia Pacific)/subregional (e.g., ASEAN) level including operating and maintenance costs.
- ❖ AMS could institute several feasibility studies on the proposed line(s) so that they have enough information to take a sound and well thought decision on the track gauge for new lines as well for modifying existing railway line(s).

10. Capacity building for enhancing rail interoperability

Enhancing the skills of railway officials would be key to strengthen rail interoperability among ASEAN Member States. The complexity and range of issues involved in rail interoperability would demand deeper understanding of the challenges involved and means to address them.

There will be pressing need to train staff in the use of digital technologies and adopting a more comprehensive approach to such training would enable rail organisations to attract and retain qualified and experienced talent. ASEAN railways could encounter multiple challenges as they aim to enhance the skills of their workforce, including resistance to change and lack of buy-in from staff.

Some railway organisations may lack the resources needed to provide comprehensive skills training. There is also a skills gap between younger and older railway officials, with the former being generally more comfortable with new technologies but having less decision-making authority. Capacity-building for rail interoperability would require action at many levels.

At the national level, comprehensive efforts should be made to develop curricula and foster a research environment that supports the development of such skills and encourages innovation. ASEAN railways should also consider establishing dedicated programmes, core groups and centres of excellence to enhance the skills of their rail personnel.

At the ASEAN level, the capacity-building initiatives for railways personnel could be supported through the development of an ASEAN capacity-building programme for rail interoperability supported by a regional pool of rail experts.

Action 10

Strengthen capacity building for rail interoperability for the ASEAN Member States in partnership with relevant international organisation

Implementation Pathway Action 10:

- ❖ ESCAP together with the ASEAN Secretariat can implement this action. ESCAP can provide technical support including discussing and finalising capacity building issues on rail interoperability together with the AMS and identifying relevant experts.
- ❖ Based on the availability of resources and formal request from AMS, it could consider financially supporting organisation of such workshop(s).
- ❖ To run the capacity building programme on rail interoperability on a continuing basis, partnership with other donors and development partners should be considered.

11. Financing for rail interoperability

As per Asian Transport Outlook in 2021, the availability of heavy rail infrastructure in Southeast Asia stood at an average of 35 km per million population, falling significantly short of the rest of Asia's 99 km per million (109 km including HSR), especially compared to East Asia's 108 km per million (135 km including HSR).

Similarly, the urban rail availability in the subregion remains limited, serving only about 1.7 kilometres per million urban residents. This is significantly lower than the Asia-Pacific average of 6 kilometres per million and less than East Asia's nearly 11 kilometres per million.

This alludes to substantial need for rail investment in the Southeast Asia. Financing rail infrastructure has traditionally been done through government support but many of the recent high speed rail projects in AMS have been financed with substantial amount of debt.

Financing rail projects with high amount of debt is fraught with risk of adverse macro-economic impacts that could spill over to other countries should the project does not goes as planned. Therefore, it is important for AMS to expand their understanding on emerging opportunities and diversify the source of financing for rail investments.

Involving private sector in rail financing through well-developed public private partnership models with improved risk sharing options should be considered a priority by the AMS. In this regard, the AMS should consider developing supporting legal and regulatory framework on public private partnerships.

Due to rail's low carbon footprint, climate finance has opened a new window of opportunity for financing rail infrastructure. This includes accessing climate funds, carbon finance markets, and green commercial financing.

Green loans and bonds can finance green investments, for example, electric locomotives. Sustainable commercial finance is growing rapidly, just the green bonds issued in 2022 which amounted to 487\$ billion⁴. The borrowers must be creditworthy for such financing and where they are not, this can encourage measures to improve corporate governance of railways.

Multilateral development banks can continue to support rail infrastructure investment through multi-currency loans, grants, equity, guarantees and co-financing. International development agencies are also important source of infrastructure finance such as loans and grants.

Given that the railways in AMS are undergoing rapid expansion, it would be crucial to undertake a comprehensive study on the financing needs of the railways in AMS along with possible sources of financing including consideration of a financing modality for rail at ASEAN level.

Action 11

Undertake Comprehensive Assessment of Financing Requirements of Railways of ASEAN Member States elaborating upon possible financing options

Implementation Pathway Action 11:

- ❖ ESCAP in cooperation with the World Bank as well as other development partners can organise a comprehensive assessment study on the financing needs of the railways of AMS along with possible financing options, particularly elaborating the emerging sources to finance rail investments.

⁴ <https://blogs.worldbank.org/en/transport/how-mobilise-climate-finance-railways>

12. Challenges in developing high-speed rail in AMS

Due to its long term multiple positive spillovers including sustainable mobility, the high-speed rail (HSR) has attracted considerable attention among many countries in Southeast Asia.

Though not considered a HSR line in terms of UIC definition, the China-Laos railway, operationalised in 2021, has reduced the travel time from Vientiane to the Chinese border from 15 hours to less than four hours, opening new opportunities for trade and tourism for Lao People's Democratic Republic as well as for other countries in Southeast Asia. The railway line that cost around USD 6 billion is expected to serve as a key artery linking countries in Southeast Asia with China and onwards to countries in North and Central Asia.

The Jakarta-Bandung 142 Km HSR in Indonesia was operationalised in October 2023 reducing the time between two cities to under one hour from two to three hours previously. Thailand's HSR plans include four lines to be developed during this decade. In December 2024. Viet Nam's national assembly approved developing 1,541 km long north-south high-speed rail costing nearly USD 67 billion. The construction on this project is expected to start in 2027 and basically finish in 2035.

The rapid developments on high-speed railway have thrown multiple challenges for AMS that include land acquisition issues, technology selection, environmental concerns, financing HSR projects, debt sustainability, access to technology, human resource readiness, efficient management & operation of large scale HSR projects, harnessing full potential of HSR spillovers, policy coordination with air transport, managing large scale rail infrastructure projects. Also, public sentiments and acceptance of large scale HSR project as well as effective government to government coordination is crucial, if the line involved is cross-border.

Compared to purely domestic HSR projects, the business cases for implementing HSR for AMS could be significantly strengthened by accounting for the wider socio-economic benefits particularly for cross-border operations that provide access to much of the ASEAN market. Close cooperation among AMS in conceptualising and developing HSR systems is essential to support full rail interoperability.

This cooperation can range from:

Strong	Active coordination on development planning and timelines as well as on alignment of legal, operational and technical frameworks compatibility to ensure full interoperability including development of Master Plan
Medium	Coordination with intention to enable full interoperability over time, though efforts may be phased or limited in scope
Low/ Basic	Limited engagement, primarily through sharing of experiences, lesson learnt or best practices

Other potential collaboration and cooperation is to develop ASEAN-based HSR standards and technologies to allow seamless integration and adoption. Accordingly recommended action for efficient development of high-speed railway

Action 12

Establish an appropriate mechanism to deepen collaboration on HSR development in AMS

Implementation Pathway Action 12:

- ❖ For this action, implementation would depend on the level of collaboration on HSR envisaged by AMS.
- ❖ A closer cooperation could entail developing an ASEAN Master Plan on High-Speed Rail, that can among others, elaborate cooperation on such areas as network development, coordinated infrastructure development, operations and maintenance, standard setting as well as financing strategies.
- ❖ Less strong form of cooperation could include sharing experiences; learning from each other; capacity development and other such areas as considered appropriate by AMS on HSR development within the existing platform provided by the ASRWG.
- ❖ ESCAP, together with the development partners can support AMS under both forms of cooperation on HSR development.

13. Harnessing full potential of urban rail transit in AMS

AMS have experienced rapid urbanisation and rising income levels in the recent years with almost half of the population in these countries living in urban areas that is expected to rise to 66 per cent by 2050.

This is expected to triple the demand for urban transit between 2015 to 2050. Urban rail transit systems play a vital role in rapidly growing cities of AMS in dealing urbanisation challenges as congestion, pollution and emission.

Statistics from Asian Transport Outlook indicate that Southeast Asia's urban rail network was about 587 kilometres in 2021 and dominated by metro systems (94 per cent), is concentrated primarily in Singapore (39 per cent), followed by Malaysia (26 per cent) and Thailand (16 per cent)⁵.

Overall, the urban rail availability in the subregion remains limited, serving only about 1.7 kilometres per million urban residents. This is significantly lower than the Asia-Pacific average of 6 kilometres per million and less than East Asia's nearly 11 kilometres per million⁶. Over 80 urban rail projects with estimated investment of USD 270 billion are planned in AMS by 2027⁷.

While development of urban rail transit provides opportunities to address many of the urbanisation challenges, efficient development of urban rail transit would need sustained efforts and cooperation among AMS in addressing challenges related to financing, technical expertise, land acquisition, modal integration, safety and security, mainstreaming new technologies, integration of green initiatives for developing efficient urban rail transit.

Action 13

Institutionalise experience sharing and capacity building for urban rail development in ASEAN Member States

⁵ Institute for Transportation and Development Policy. (2020, October 11). Rapid Transit Database. I. <https://itdp.org/rapid-transit-database/>

⁶ Estimated using Institute for Transportation and Development Policy. (2020, October 11). Rapid Transit Database. I. <https://itdp.org/rapid-transit-database/> ; United Nations Department of Economic and Social Affairs Population Division. (2022). World Population Prospects 2022. <https://population.un.org/wpp/>

⁷ <https://southeastasiainfra.com/rail-development-in-asean-role-of-national-and-state-governments/>

Implementation Pathway Action 13:

- ❖ The implementation pathway for this is to use of ASEAN's existing platform provided by the ARSWG by regularly organising a dedicated session devoted exclusively on the developments in urban rail transit in AMS detailing, among others, on good practices, challenges faced and identifying common issues for norm setting as well as for capacity building.
- ❖ In addition, based on the request from an AMS on specific issue(s) related to capacity building on urban rail, ESCAP in partnership with relevant stakeholders can organise related studies followed by seminar/workshop as deemed appropriate.

14. Enhancing transport sustainability among ASEAN member states

The rapid growth in demand for transport in the AMS will bring proportionate increase in carbon emissions, air pollution and road congestion accentuating the negative externalities of transport. The existing policies and measures are expected to play a significant role in curbing these negative externalities from transport.

However, ambitious policies will be necessary to achieve targets in reducing emissions and pollution in line with Paris Agreement that limits global warming to 1.5 C compared to pre-industrial levels. To achieve this the agreement calls for reduction on greenhouse gas emissions and importance of net zero emissions.

Promoting rail transport is clearly among the more pragmatic policy options to achieve these objectives of the agreement. Due to its low carbon footprints and energy efficiency, rail can meet rising demand for transport among AMS, while keeping transport negative externalities under check.

Moreover, the widening gap in infrastructure investment with ASEAN's road network expanding annually at 3.2 per cent as compared to 1.5 per cent for rail needs reorientation. It appears that it has already started to change with many AMS making investments in improving their rail networks.

To propel sustainable growth among ASEAN Member States- a resilient low carbon transport system is urgently needed. Railways in ASEAN constitute about 2.6 and 3.6 per cent respectively of passenger and freight demand and emit about 1.1 per cent of carbon emissions and consume one per cent of energy indicating the potential to enhance role of rail in meeting transport demand.

However, increasing role of rail transport among AMS is not going to be straight forward and would need consistent and sustained efforts by AMS and development

partners. It would need a multipronged approach focusing on rail infrastructure as well as on operational aspects at all levels, urban, national and international.

One of ways to improve modal share of rail is through higher efficiency and reliability of rail operations that this Strategic Plan aims to achieve. Its implementation would make rail more economical and reliable for shippers-making shift to rail a reality.

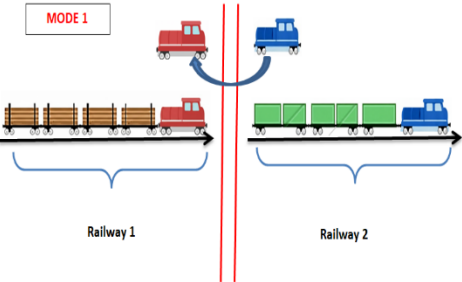
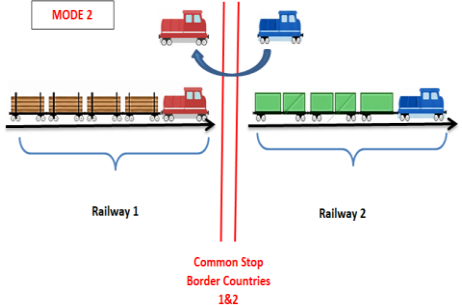
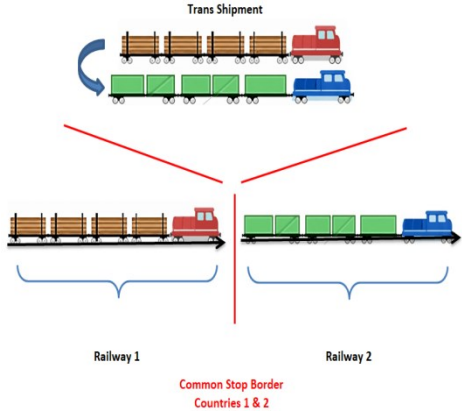
Action 14

Promote rail through proactive policy measures to enhance sustainability of transport in AMS

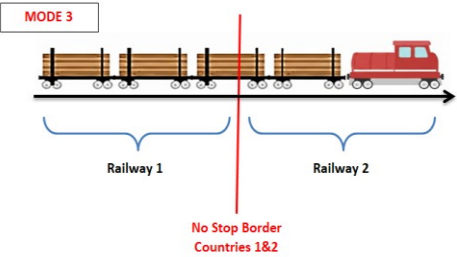
Implementation Pathway Action 14:

- ❖ The implementation pathway for this action is for AMS to prioritise the actions elaborated in this strategic plan and take them up for implementation through an Action Programme.
- ❖ ESCAP in partnership with relevant stakeholders would support implementation of the strategic plan through an Action Programme to enhance efficiency of rail transport increasing rail's modal share thereby promoting a more climate friendly transport in AMS

4 ANNEX 1 – Rail Interoperability Levels and Border Crossing Modes

No	Border Crossing Scheme	Agreed Legal Framework	Level Inter-operability	Border Crossing Mode	Description of the Achieved Interoperability
1	 MODE 1 Railway 1 Railway 2	NO			Harmonised legal environment between the two railways does not exist and international trains cannot be operated. Technical and operational harmonisation are irrelevant in this case.
2	 MODE 2 Railway 1 Railway 2 Common Stop Border Countries 1&2	YES	LEVEL A	MODE 1 or MODE 2	Harmonised legal environment between the two railways is in place. The train stops at the common border station agreed upon by the two neighbouring countries. The wagons of the exit railway cannot operate on the network of entry railway. The freight is reloaded in the wagons of the entry railway and a new train with a locomotive from entry railway is composed. Border crossing procedures are developed by the authorities of the two states in parallel or consecutively.
3	 Trans Shipment Railway 1 Railway 2 Common Stop Border Countries 1 & 2	YES	LEVEL B	MODE 1 or MODE 2	Harmonised legal environment between the two railways is in place. The train stops at the common border station agreed upon by the two neighbouring countries. The track gauge of the two railways is different, and bogie change is necessary at the border station. The locomotive

					of the entry railway will replace the locomotive of the exit railway. Border crossing procedures are developed by the authorities of the two states in parallel or consecutively.
4	MODE 1 Railway 1 Railway 2 Stop Border Country 1 Stop Border Country 2	YES	LEVEL B	MODE 1	Harmonised legal environment between the two railways is in place. The train stops consecutively at the border stations of each country for border crossing procedures. The technical parameters of the two railways allow only wagons to continue the route. Locomotive of the entry railway will replace the locomotive of the exit railway.
5	Trans Shipment Railway 1 Railway 2 Common Stop Border Countries 1 & 2	YES	LEVEL B	MODE 2	Harmonised legal environment between the two railways is in place. The train stops at the common border station agreed upon by the two neighbouring countries. The technical parameters of the two railways allow only the wagons to continue the route. The locomotive of the entry railway will replace the locomotive of the exit railway. Border crossing procedures are developed in parallel by the authorities of the two states in one single point.

6		YES	LEVEL C	MODE 1	Harmonised legal environment between the two railways is in place. The technical parameters and operational rules are fully compatible. The train can continue smoothly the route without stopping at the border.
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5 ANNEX 2 – Brief description of OTIF and OSJD

Intergovernmental Organisation for International Carriage by Rail (OTIF)

The scope of the *Intergovernmental Organisation for International Carriage by Rail* (OTIF) is to promote, improve and facilitate, in all respects, international traffic by rail.

To achieve the above, a uniform law system is established, and support is given to implementing and developing it. These uniform rules cover the following fields of law:

The contract of carriage of passengers and goods in international traffic by rail between the member states, this system of law is also applicable to international carriage subject to a single contract

The contract of use of wagons as means of transport in international rail traffic

The contract of use of infrastructure in international rail traffic

The carriage of dangerous goods

OTIF also carries out other activities concerning:

Provisions on interoperability and technical harmonisation in the railway field

Technical approval of railway material intended for use in international traffic

Contribution to the facilitation of border crossing in international carriage by rail

On 1 May 1985, the Convention concerning International Carriage by Rail was agreed upon by the member states, and the Intergovernmental Organisation for International Carriage by Rail (OTIF) was born. Further significant modification of COTIF was brought about by the Vilnius Protocol of 3 June 1999 (1999 Protocol), which entered into force on 1 July 2006. The Organisation's headquarters are in Berne (Switzerland).

The uniform rules currently applicable to international carriage by rail for the COTIF countries are contained in the Appendices to COTIF:

Appendix A	Uniform Rules concerning the Contract of International Carriage of Passengers by Rail (CIV)
Appendix B	Uniform Rules concerning the Contract of International Carriage of Goods by Rail (CIM)
Appendix C	Regulation concerning the International Carriage of Dangerous Goods by Rail (RID)
Appendix D	Uniform Rules concerning Contracts of Use of Vehicles in International Rail Traffic (CUV)
Appendix E	Uniform Rules concerning the Contract of Use of Infrastructure in International Rail Traffic (CUI)
Appendix F	Uniform Rules concerning the Validation of Technical Standards and the Adoption of Uniform Technical Prescriptions applicable to Railway Material intended to be used in International Traffic (APTU)
Appendix G	Uniform Rules concerning the Technical Admission of Railway Material used in International Traffic (ATMF)

At present, OTIF has 51 Member States in Europe, North Africa, and the Near East: Afghanistan, Albania, Algeria, Armenia, Austria, Azerbaijan, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iran, Iraq, Ireland, Italy, Jordan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Monaco, Montenegro, Morocco, Netherlands, North Macedonia, Norway, Pakistan, Poland, Portugal, Romania, Russia, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Syria, Tunisia, Turkey, Ukraine, and United Kingdom.

The Uniform Rules created by OTIF are currently applicable to international rail transport on railway infrastructure of about 250,000 km and to complementary carriage on 17,000 km of shipping lines and inland waterways, as well as prior or subsequent domestic carriage by road.

Organisation for Cooperation between Railways (OSJD)

OSJD addresses the following activities:

Development and improvement of international railway transportation with the traffic between Europe and Asia in the first place, including combined transportation

Development of consentaneous transport policy in the field of international railway traffic

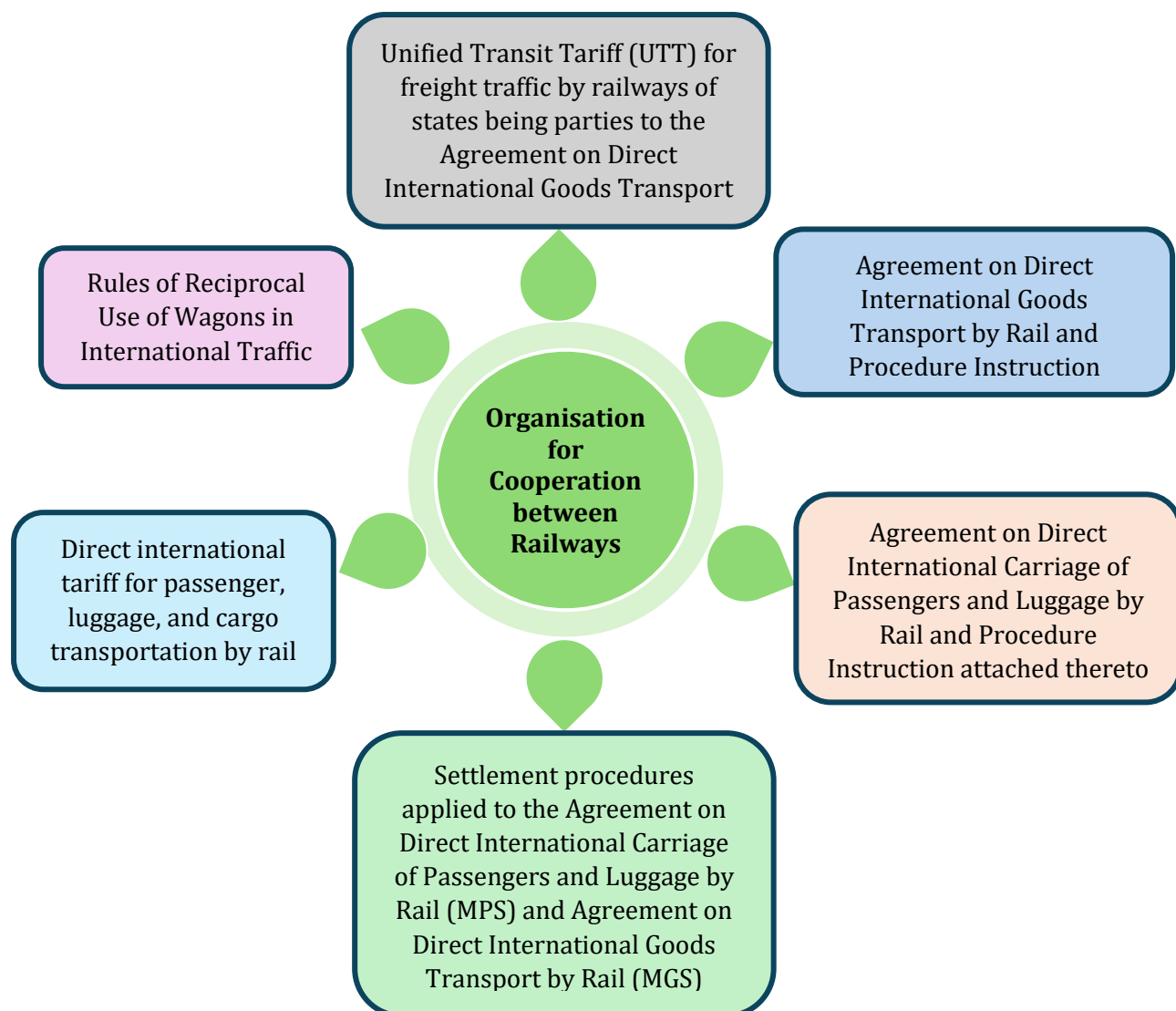
Cooperation for the solution of the problems connected with the economic, information, scientific, technological, and ecological aspects of railway transport

Development of measures aimed at the increase of railway transport competitiveness compared with other modes of transportation

Cooperation in the field of railway operation and technical matters connected with the further development of international railway traffic

Collaboration with other international organisations engaged in railway transportation matters, including those of combined transport

OSJD adopted by consensus a series of documents related to the improvement of international transport law for facilitating international carriage of passengers and freight traffic, starting with:



Having been established over 50 years ago, OSJD carried out both active and fruitful activities despite difficulties due to the complicated international situation. The specific nature of the approach of activities at OSJD based on collegial railway problem handling allowed it to retain its status as a recognised international institution despite significant political changes in Europe and Asia.

The new geopolitical environment formed in the 90s of the 20th centuries required coordinated activities by all participants of the international railway traffic to ensure regular transcontinental rail communication between Europe and Asia. Many countries joined OSJD after 1990, and Germany, France, Greece, and Finland are observer states now.

Presently, the OSJD has 29 members, including Azerbaijan, Albania, Afghanistan, Belarus, Bulgaria, Estonia, Hungary, Vietnam, Georgia, Iran, Kazakhstan, China, Republic of Korea, Cuba, Czech Republic, Kyrgyz Republic, Latvia, Lao PDR, Lithuania, Moldova, Mongolia, Poland, Russia, Romania, Slovak Republic, Tajikistan, Turkmenistan, Uzbekistan, Ukraine.

The railway network of the OSJD member countries amounts to 336 thousand km of railway lines of various gauges, on which are carried annually more than 5.5 billion passengers and 5.6 billion tonnes of goods.

6 ANNEX 3 – OSJD Railway Corridors

In 2009 within the framework of the OSJD Commission on Transport Policy and Development Strategy the development of the subject “OSJD Railway Transport Corridors and their parameters” was completed.

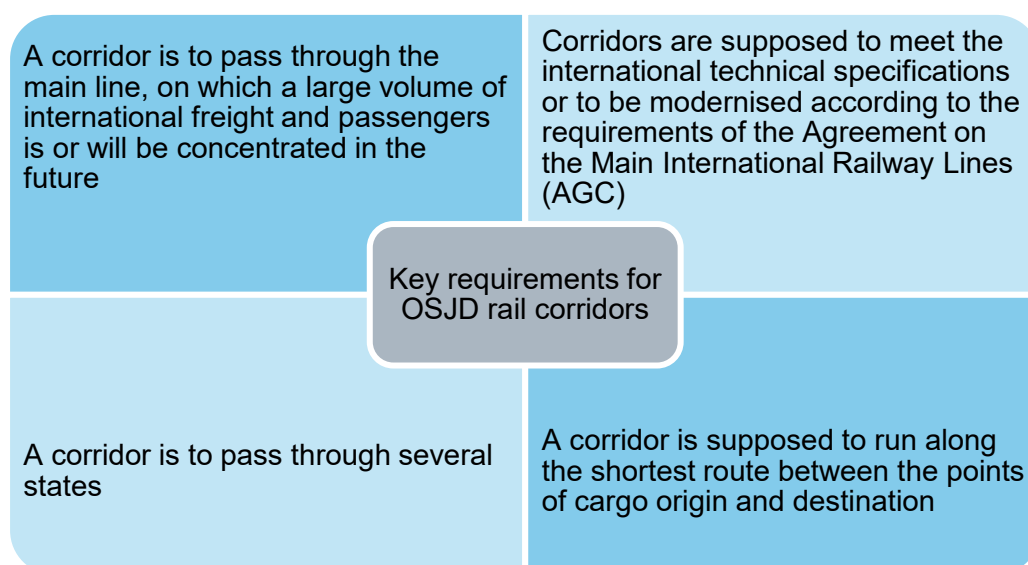
The experts and representatives of the following OSJD member countries took part in the development process: Azerbaijan, Belarus, Bulgaria, Hungary, Vietnam, Georgia, Iran, Kazakhstan, China, Democratic People's Republic of Korea, Kyrgyzstan, Latvia, Lithuania, Moldova, Mongolia, Poland, Romania, Russia, Slovak Republic, Tajikistan, Turkmenistan, Uzbekistan, Ukraine, Czech Republic, Estonia, as well as representatives of UNESCAP, SNCF, and Deutsche Bahn AG.

The materials of the European transport corridors, adopted in Helsinki, Crete and St. Petersburg, memoranda on OSJD corridors 3 and 5, materials on the TRACECA corridor, Trans-Asian Railway, developed by the UNESCAP were used for creation of the OSJD Railway Transport Corridors.

While elaborating the corridor transport network the following specifications were considered: Railway Transport Corridor is a set of ground railway lines and rail-water crossings with modern equipment, designed to concentrate in them international transit traffic with minimum time for delivering cargos and passengers, high operational and economical performances.

OSJD Corridors are three directions: Latitudinal direction (East – West); Meridional direction (North – South); And those, occupying intermediate position between the corridors of latitudinal and meridional directions.

Key requirements for OSJD rail corridors:



Thirteen OSJD Railway Transport Corridors have been adopted. Each rail corridor expands the main technical characteristics of sections of a corridor as well as operational performance including such areas as. traction and weight standards; bottlenecks; main stations; container terminals; border crossing points along the corridor; traffic volumes; administrative subordination; transit area served by railway; transport law and tariff.

Implementation plan for a memorandum on cooperation in the field of technical, operational and commercial development of the railway corridor has also been developed for some rail corridors.
