Workshop Japan Quality Road Infrastructure Development

4-6 March 2025, Tokyo, Japan

Ministry of Public Works and Transport of LAO PDR
Department of Roads

Presentation on

Issues and Challenge for Climate Resilient Road Infrastructure in Lao PDR

CONTENTS

1. INTRODUCTION

1 Name of Participants

1. Mr. Phitsaphonh Philavong, Deputy Director of the Department of Roads;
2. Mr. Phoutthaphong Pharanhok, Staff of the Department of Roads.

2 Name of Country

- Lao People Democratic Republic

3 Name of Organization/Department

- Department of Roads, Ministry of Public Works and Transport

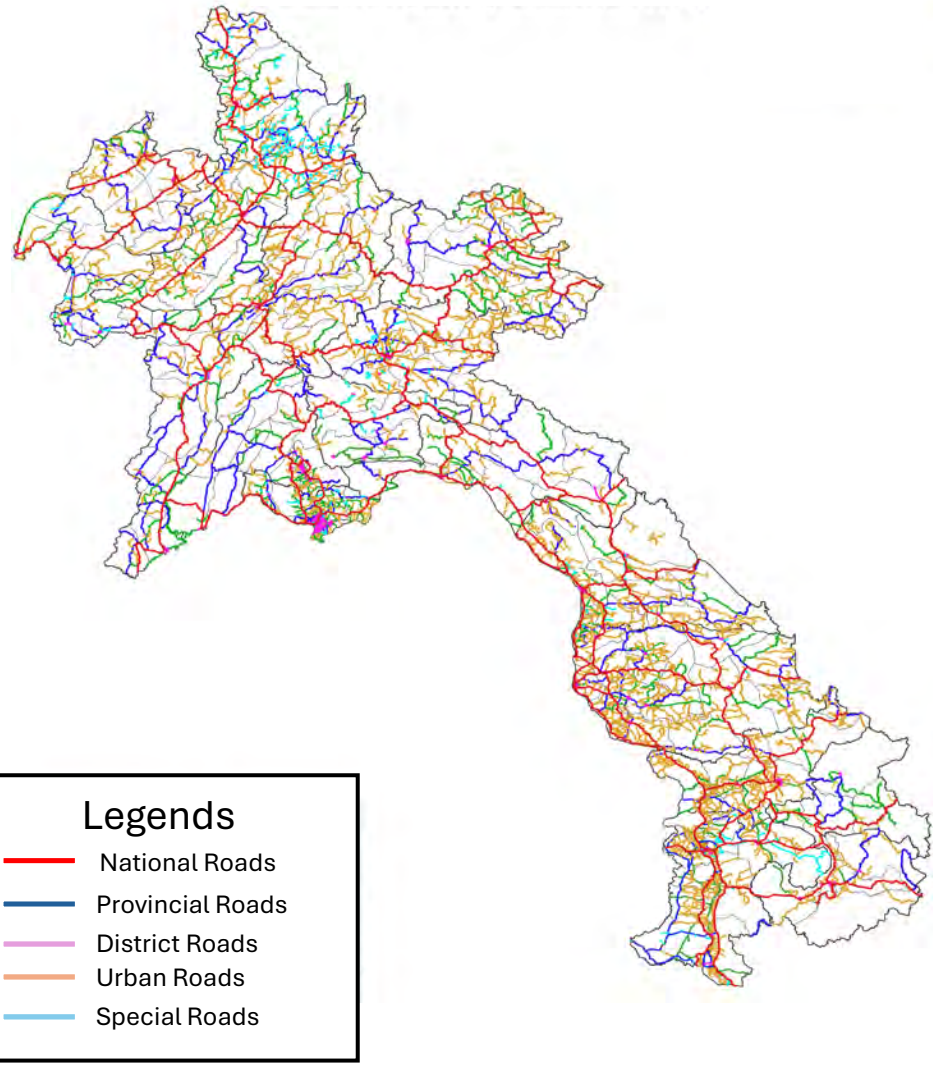
4 Role and responsibility

- The Department of Roads is responsible for every aspect of roads and bridge construction, maintenance, road network planning strategy, coordination with all government sectors, doners and works under the Ministry of Public Works and Transport.

2. GENERAL INFORMATION OF LAOS

- **Lao People's Democratic Republic**
  - **Capital:** Vientiane
  - **Population:** 2022 estimate 7,749,595
  - **Official languages:** Lao
  - **Density:** 26.7/km^2 (69.2/sq mi)
  - **GDP :** 2023 estimate Total $74.309 billion / 2100 USD per Capita
  - **Currency:** Kip (₭) (LAK)
- Laos is the only landlocked country in Southeast Asia that relies heavily on land transport 98% and 86% of freight transported over the road network.
- 70% of the land is mountainous, and many roadways have been built over mountain ranges.

3. TYPE OF ROAD IN LAOS



- The Total length of Laos road network is 59,963.61 km with 1.45% paved with concrete, 12.03% with asphalt concrete and 75.77% with double bituminous surface treatment and 10.75 with gravel road.
- **The roads in the LAO PDR are classified into 6 categories such as:**

  (1) National Roads, (2) Provincial Roads, (3) District Roads,
  (4) Urban Roads, (5) Rural Roads, (6) Special Roads

Road Type	Surface Type (km)					
	Concrete	Asphalt	DBST	Gravel	Earth	Total
National Road	167.42	1,139.04	5,439.37	855.67	278.69	7,880.19
Provincial Road	140.50	103.30	2,455.75	4,899.52	1,054.27	8,653.34
District Road	115.52	-	986.02	4,596.26	1,753.54	7,451.34
Urban Road	320.62	172.45	1,521.47	1,479.92	770.77	4,265.23
Rural Road	105.62	4.00	1,114.85	12,015.66	12,372.24	25,612.37
Special Road	60.45	11.53	360.60	1,369.36	4,299.20	6,101.14
Total Road	910.13	1,430.32	11,878.06	25,216.39	20,528.71	59,963.61

4. ASEAN HIGHWAY IN LAOS PDR

NR No.	AH No.	Distance (km)	Surface Type	Loading Capacity Ton/Axle	Remarks
3	AH.3	200.70	Asphalt Concrete	11	20.4 km is Cement Concrete
13N	AH.12	625.8	DBST	9.1	70Km of the road section from Vientiane to Phonhong is design for 11 Ton/Axle
13S	AH.11	831.1	Asphalt Concrete DBST	9.1	From Km 71-346 Bolikhamsay to Khammouan Province is design for 11 Ton/Axle
8	AH.15	131	DBST	9.1	79.4 km is Asphalt Concrete
9	AH.16	236.6	Asphalt Concrte	11	13 km is Cement Concrete
12	AH.131	145.6	DBST	11	Under Improving
2E, 2W	AH.13	190.3	DBST	9.1	Under Improving for 11 Ton per Axel
18	AH.132	111.9	DBST	9.1	107.8 km of the road is design for 7 Ton/Axle

5. NATURAL DISASTER OCCURRED AND CHALLENGE IN LAOS

Laos suffered from many natural disasters almost every single year in the last decade, creating a considerable negative impact, primarily on the road sector and other transportation facilities, Here are some of the previous storm and typhoon incidences in Laos:

2008, the Kamuli storm caused heavy rainfall and flooding, affecting 228,320 people and causing 4.4 million USD in road damage

2011 Nok Ten storm impacted 12 provinces in northern and central, affecting 500,000 people and incurring 2.2 million USD in road sector damage.

5. NATURAL DISASTER OCCURRED AND CHALLENGE IN LAOS

2018 Serntin Storm caused road damage from landslides and flooding in the northern and central, causing 10 million USD in road damage.

2019 Vipha storm impacted the three Southern provinces with the total amount of 9 million on road damage.

5. NATURAL DISASTER OCCURRED AND CHALLENGE IN LAOS

2022 Tropical Storm Mulan produced heavy rains and floods in 29 districts in the North and costed 2.5 million USD damaged on road sector.

In 2024, Typhoon Yagi hit northern Lao PDR, producing a massive flooding and affecting up to 200,000 people. The typhoon also caused $5 million in road damage.

6. INTERNATIONAL PARTNERSHIP IN LAOS TO DEVELOP CLIMATE RESILIENT ROAD DESIGN METHOD.

Climate change and human activity have resulted in multiple natural catastrophes in Laos, inflicting considerable damage to transportation infrastructure. As a result, Laos has partnered with many international partners and funders on multiple projects that employ a range of road structures to withstand and extend the life of the road, including the World Bank, NDF, ABD, EIB, AIIB, NEDA, JICA, and KFW. Here are the successful examples that are currently being implemented in Laos:

6.1. The Southeast Asia Regional Economic Corridor and Connectivity started from 2022 to 2028 (SEARECC)

Overview

1. The Project's purpose is to boost regional and domestic trade, as well as transportation links, along Southeast Asia's East-West route.
2. To improve the climate resistance of National Road No. 2W and 2E and local roads in the five northern provinces.

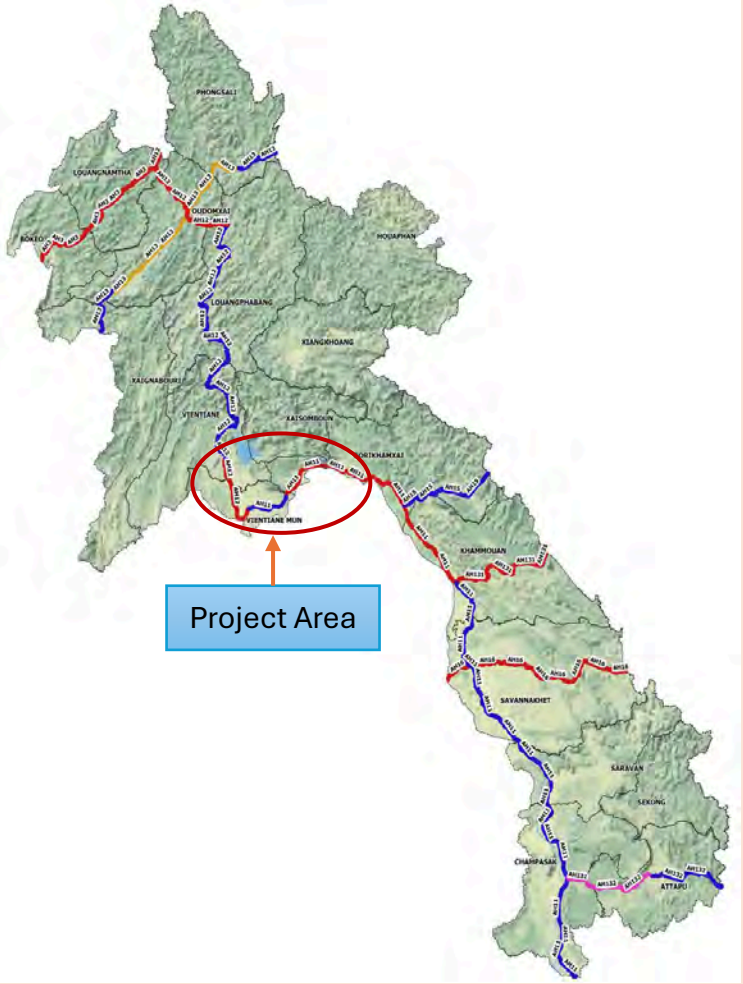
Implementation Method

1. Improve and maintain the condition, safety, and climate resilience of NR 2W and 2E to meet Asian Highway Class III standards.
2. OPBRC is used for this project with a 3 - year implementation term for construction and 7 - years for operations and maintenance.

New Initiatives for of climate resilience

1. Analyzes future climate predicts to assess floods and landslides, as well as previous data on extreme rainfall events for reducing flooding.
2. Provide government and stakeholder training on contingency plans so that they can respond promptly to emergencies and prepare for natural disasters.
3. The bridges along the road constructed to resist future flood levels, with a 15% increase higher than historical data.

6. INTERNATIONAL PARTNERSHIP IN LAOS TO DEVELOP CLIMATE RESILIENT ROAD DESIGN METHOD.



6.2 Laos - National Road 13 N and 13 South Improvement and Maintenance Project.

Overview

1. The National Road 13N and 13S Improvement and Maintenance Project for Laos aims to promote transportation connections by repairing and upgrading the road that forms the major road network of the Lao PDR.

2. Enhancing connectivity and supporting inclusive economic growth of the country.

Implementation Method

1. The project provides support for managing OPBRC implementation 3-year improvement and 7-year maintenance.

2. Conducting the traffic safety awareness campaigns, enforcing overloading control, enhancing environmental and social monitoring, and supervising road improvement and maintenance works.

New Initiatives for of climate resilience

The project follows:

1. Environmental and social safeguards by developing Environmental and Social Impact Assessments (ESIA),

2. Environmental and Social Management Plans (ESMP)

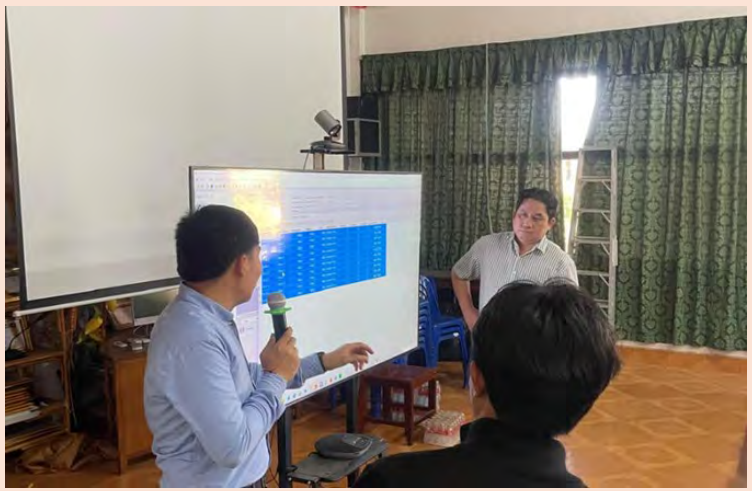
To help to reduce any negative consequences, particularly when coping with natural disasters.

6. INTERNATIONAL PARTNERSHIP IN LAOS TO DEVELOP CLIMATE RESILIENT ROAD DESIGN METHOD.

The purpose of LRSP 2 is to enhance local road maintenance in Laos in order to provide consistent connectivity between local roads and national roads, as well as effective disaster and emergency responses. The project focuses on climate-resilient road maintenance in six provinces of Laos. The project's main strategy is given below:

6.3 LAOS ROAD SECTOR PROJECT 2

- Provide training on road maintenance processes, emergency preparedness measures, and the use of tools such as PROMMS and RMS for data updates, as well as frequent road structure monitoring when the road infrastructure is in poor condition.
- Provide training programs for provincial staff to assist them understand and implement climate-resilient road design comprehensively.



6. INTERNATIONAL PARTNERSHIP IN LAOS TO DEVELOP CLIMATE RESILIENT ROAD DESIGN METHOD.

The Lao Road Sector Project 2 (LRSP2) also use other methods to enhance the climate resilience of road infrastructure in the project provinces such as:

6.3 LAOS ROAD SECTOR PROJECT 2

Each project province employs technical consultants who have been engaged to give support and provide quality control throughout project implementation, such as improving road infrastructure and enhancing culvert installation to better handle climate-related pressures and floods.

Utilizing performance-based maintenance (PBC) to ensure that road improvements in each project province to fulfill certain performance criteria over time, hence enhancing sustainability and long-term functionality.

7. Expectation from the Workshop and Future method for Climate Resilience Road Design

- To see and obtain the knowledge about innovative technologies, particularly from Japan and the participating countries.
- To exchange information about the materials that can withstand severe temperatures, particularly in hot climates, as well as adopting more natural-based solutions to build flood-resistant roads.
- To exchange knowledge on how to develop an action plan when dealing with climate change.
- Road maintenance with new innovative high-quality materials.
- Road and Bridge design, Pavement management and road construction management.
- To obtain knowledge about the mechanism how to secure the Source of funding for road and bridge building and maintenance.

THANK YOU