NEPAL
DEPARTMENT OF ROADS (DOR)
DEPARTMENT OF WATER RESOURCES AND IRRIGATION (DWRI)
ROADS BOARD NEPAL (RBN)

THE PROJECT
FOR
OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD (PHASE 2)

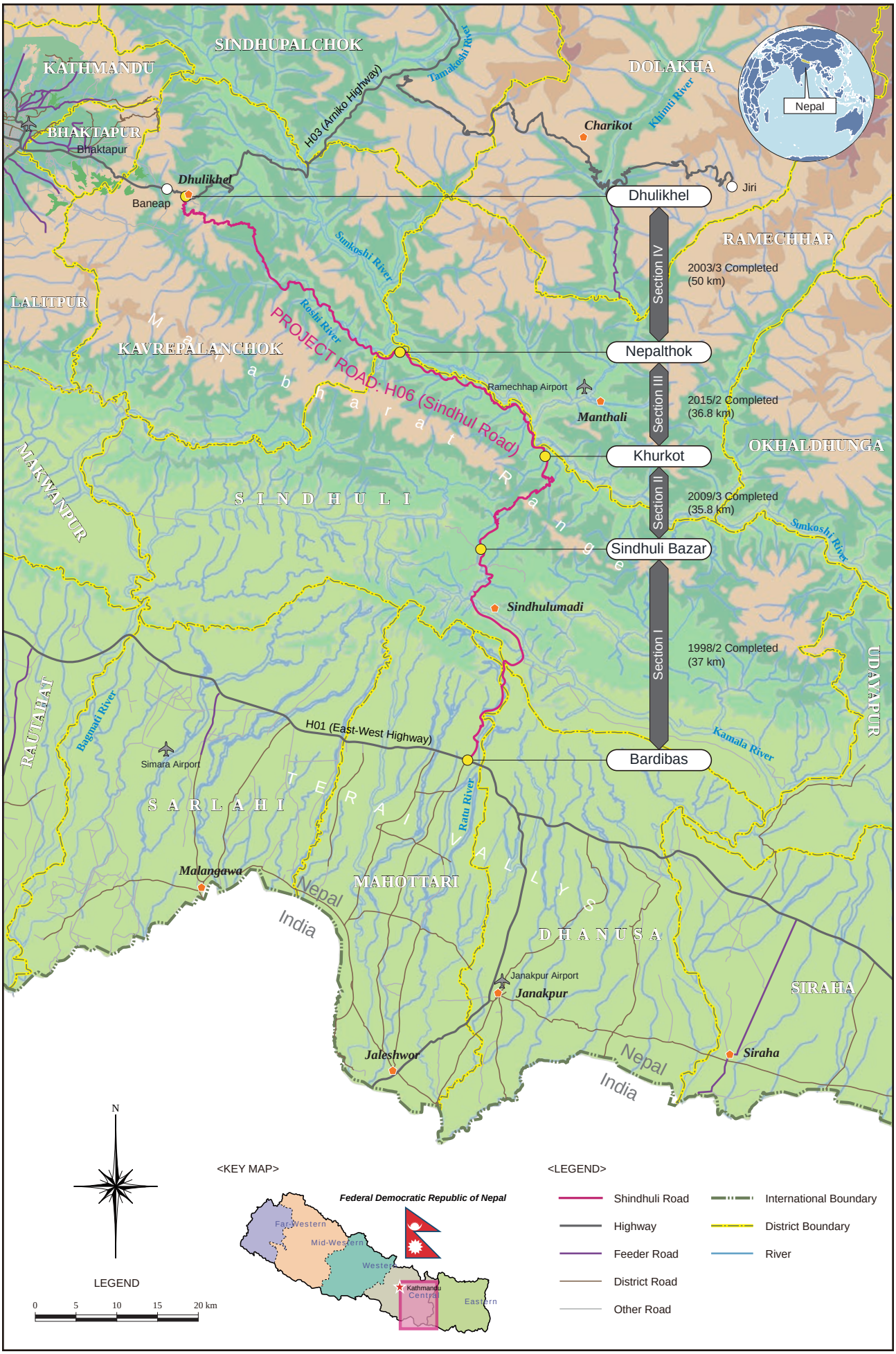
PROJECT COMPLETION REPORT

FEBRUARY 2023

JAPAN INTERNATIONAL COOPERATION AGENCY（JICA）

NIPPON KOEI CO., LTD.
METROPOLITAN EXPRESSWAY CO., LTD

IM
JR
23-003



LOCATION MAP OF SINDHULI RAOD PROJECT

ABBREVIATIONS

ALB	**Automatic Lane Barrier**
ANPR	**Automatic Number Plate Recognition**
ARMP	**Annual Road Maintenance Plan**
AVC	**Automatic Vehicle Classification**
Ch	**Chainage**
CP	**Counterpart**
DAC	**Development Assistance Committee**
DCID	**Development Cooperation Implementation Division**
DOR	**Department of Roads**
DOTM	**Department of Traffic Management**
DHM	**Department of Hydrology and Meteorology**
DWRI	**Department of Water Resources and Irrigation**
EIS	**Emergency Information System**
EMP	**Environmental Management Plan**
ETC	**Electronic Toll Collection**
GIS	**Geographic Information System**
GON	**Government of Nepal**
HETC	**Hybrid Electronic Toll Collection**
HMIS	**Highway Management Information System**
IFRC	**International Federation of Red Cross and Red Crescent Societies**
ITS	**Intelligent Transport Systems**
JCC	**Joint Coordination Committee**
JICA	**Japan International Cooperation Agency**
LSD	**Lane Side Display**
MoPIT	**Ministry of physical Infrastructure and Transport**
OBC	**Optimum Bitumen Content**
O/M	**Operation and Maintenance**
PDM	**Project Design Matrix**
POS	**Point of Sales**
Pre-F/S	**Pre-Feasibility Study**
R/D	**Record of Discussion**
RBN	**Roads Board Nepal**
RCSB	**Reinforced Concrete Continuous Slab Bridge**
RFID	**Radio Frequency Identification**
ROW	**Right of Way**
SDDSDRP	**Suryabinayak-Dhulikhel, Dhulikhel-Sindhuli-Bardibas Road Project**
SDI	**Surface Distress Index**
SROM2	**The Project for Operation and Maintenance of the Sindhuli Road phase2**
TAR	**Traffic Accident Ratio**
WBS	**Work Breakdown Structure**

Table of Contents

List of Figure

List of Tables

Project Completion Report

I. Basic Information of the Project

1. Country

Nepal

2. Title of the Project

The Project for Operation and Maintenance of the Sindhuli Road Phase 2 (herein after referred as “the Project”)

3. Duration of the Project (Planned and Actual)

Planned: 36 months

Actual: 48 months

Due to the COVID-19 pandemic, some of the project activities had been suspended for a certain period. In order to achieve the project purpose, it was considered that the duration of the Project is needed to be extended by one (1) year, based on the discussion in the 4th Joint Coordination Committee held on December 21, 2020, to secure sufficient time for conducting continuous activities of the Project.

4. Background (from Record of Discussions(R/D))

The Sindhuli Road was constructed under Japanese grant aid as a trunk road connecting the capital city of Kathmandu and the Terai Plain, southern part of Nepal. The Sindhuli Road (160 km) was fully opened in March 2015. It is a mountain road that passes through a steep terrain with an altitude difference of 1,000 meters. Therefore, technical cooperation aiming for the safe and smooth road traffic of “The Project for Operation and Maintenance of the Sindhuli Road” (herein after referred to “Phase 1”) was conducted from 2012 to 2015 (4 years). As a result, the road maintenance system as well as road traffic management system of the Sindhuli Road were established and the road disaster prevention technology of DOR and DWRI was strengthened.

However, after completion of Phase 1, due to the rapid increase of traffic volume after the full opening of the Sindhuli Road, many new issues have emerged, such as the damaged road pavement between Nepalthok to Dhulikhel (Section 4), damages in the causeway, and the increase in road traffic accidents. For such reason, “the Project for Operation and Maintenance of the Sindhuli Road Phase

2" was requested from the Nepalese side aimed at solving these new issues and problems fully utilizing the technology established in Phase 1.

5. Overall Goal and Project Purpose (from Record of Discussions(R/D))

Overall Goal: The safe and smooth road traffic along the Sindhuli Road is maintained.

Project Purpose: The overall operation and maintenance system of the Sindhuli Road is strengthened.

6. Implementing Agency

Department of Roads (DOR)

Department of Water Resources and Irrigation (DWRI)

Roads Board Nepal (RBN)

II. Results of the Project

1. Results of the Project

1-1 Input by the Japanese side (Planned and Actual)

(1) Amount of input by the Japanese side:

Planned: JPY 238,213,720

Actual:　JPY 366,961,620 (8th Amendment Contract Price)

(2) Expert dispatch: 15 persons

The inputs of the JICA Experts are shown in Table 1.

Table 1 JICA Experts Inputs

	Position	*Name*	*Planned MM*	*Accumulated MM*
1	Chief Advisor / Road Administration	Hiroki SHINKAI	19.50	19.61
2	Deputy Chief Advisor / Road O/M Planner 1	Motoki IWAMARU	18.80	19.06
3	Road Structural Planner (Predecessor)	Hiroshi FUJISAWA	13.25	13.22
4	Road Structural Planner (Successor)	Tomokuni HAYAKAWA	5.05	6.30
5	Traffic Safety Measures / Traffic Safety Education / Project Coordinator	Bindu Shamsher RANA	11.30	11.30
6	Pavement Quality Control	Izumi MIDORIKAWA	5.90	4.15
7	Hydrologic Analysis / Flood Control	Khadananda LAMSAL	1.00	1.00
8	Road Structural Design	Ramesh Prasad KOIRALA	7.10	7.10
9	Road Disaster Prevention / EIS	Akhilesh Kumar KARNA	3.90	3.90
10	Toll Road System / Pre-F/S of Rest Area	Kiyoshi NARITA	4.20	4.20
11	ETC 1	Noboru KONDO	1.20	1.27
12	ETC 2	Ryohei HAYASHI	1.50	1.47
13	Coordination / Procurement / Social	Keita IRINO	1.00	1.00

	Environmental Analysis (Predecessor)			
14	Coordination / Procurement (Successor)	Natsuko SAGAWA	2.80	2.92
15	Road O/M Planner 2	Hikaru TANAKA	1.00	1.00
		Total	97.50	97.50

Source: JICA Expert Team

(3) Receipt of training participants:

1) Technical Training in Japan

- Period: November 2 to November 17, 2019
- Participants: 9 persons (from DOR, MoPIT, DWRI, and RBN)
- Major Training Components:
  - i) Toll Road System & Traffic Safety Management (Lecture)
  - ii) Toll Operation System Including Toll Plaza, Parking Area Facilities, etc. (Lecture)
  - iii) Toll Operation System Including Toll Plaza, Parking Area Facilities, etc. (Observation)
  - iv) Road Disaster Prevention/Disaster Countermeasure Technology (Lecture)
  - v) Maintenance of Bridge Structure (Lecture)
  - vi) Highway Infrastructure Maintenance Technology (Lecture)
  - vii) Quality Control and Management of Road Pavement (Lecture)
  - viii) Introduction of a Long Tunnel Technology at Sin-Tomei Expressway (Lecture and Observation)
  - ix) Formulation of Action Plan
  - x) Preparation for Action Plan
  - xi) Presentation

2) Technical Training on “Asphalt Concrete Mix Design and Quality Control in Pavement Construction” (in Nepal)

- Period: February 14 to February 18, 2021
- Participants: 13 persons (from DOR)
- Major Training Components:
  - i) Pavement Condition of Sindhuli Road Project (Lecture)
  - ii) Introduction of Flexible/Bitumen Pavement (Lecture)
    - Selection of Binder
    - Test of Aggregates and Binder
    - Marshall Procedure of Mix Design

- Determination of Job Mix Formula

iii) Examination of Aggregates and Binder
iv) Determination of Theoretical Grading (Lecture)
v) Selection of Mix Proportion and Preparation of Different Mixes (Lecture)
vi) Marshall Procedures and Necessary Tests of Marshall Specimens (Lecture)
vii) Field Visit to Sindhuli – Bardibas Road (Observation)
viii) Exam of Marshall Stability and Flow
ix) Mix Design Calculations, Determination of Job Mix Formula of Mix Design and Finalization of Optimum Bitumen Content (OBC) (Lecture)
x) Presentation and Submission of Mix Design Calculations and Discussion of Results

3) Road Safety Awareness Training for School Teachers (in Nepal)

- Period: June 3 and June 5, 2022
- Participants: 50 schoolteachers (from 30 different schools located in Sindhuli Road corridor)
- Major Training Components:
  i) Outline of SROM2 Project
  ii) Techers Knowledge and Attitude Test on Road Behavior Through Self-Administered Questionnaire
  iii) Road and Road Safety Status of Nepal (Lecture)
  iv) Introduction on BP Highway and Road Traffic Crash Problem in BP Highway (Lecture)
  v) Presentation on the Main Causes of Road Accident (Specific to Accident in Sindhuli Road) (Lecture)
  vi) Example Lectures of Traffic Safety Awareness to be Practiced at Each School (Lecture)
  vii) Presentation of Traffic Signs and Signals (Lecture)
  viii) Introduction of Equipment / Material to be Distributed for School Children
  ix) Feedback from Teachers

4) Domestic Technical Tour at Nagdhunga Tunnel Construction Project (in Nepal)
   - Period: June 1, 2022
   - Participants: 10 persons (from DOR)
   - Major Training Components:
     i) Lecture by Consultant Team
     ii) Site Visit to Tunnel Construction Site

5) Traffic Safety Workshop (in Nepal)
   - Period: December 16, 2022
   - Participants: 66 persons (from JICA Nepal Office, MoPIT, DOR, RBN, DOTM, World Bank Nepal, Asian Development Bank Nepal, WHO Nepal, Nepal Red Cross Society, IFRC, and Traffic Police Office)
   - Major Training Components:
     i) Outline of Sindhuli Road Project
     ii) Outline of The Project for the Operation and Maintenance of the Sindhuli Road Phase 2
     iii) Road Safety Status of Nepal
     iv) Traffic Volume Trends and Traffic Accident Situation on BP Highway
     v) National and BP Highway Accident Cost
     vi) Traffic Safety Management Plan for BP Highway
     vii) Knowledge Sharing of Road Safety Awareness Training for School Teachers
     viii) Group Work: Group Discussion and Preparation of Presentation
     ix) Presentation of Group Work 1: Traffic Accident Analysis with Referring to Accident Record, Vehicle Speed and Road Geometry
     x) Presentation of Group Work 2: Countermeasure Against Traffic Accident on BP Highway
     xi) Presentation of Group Work 3: Approaches for Sustainable Safety Awareness Activity
     xii) Question and Answer
     xiii) Feedback (Questionnaire)

6) Training on Planning and Design Manual of Reinforced Concrete Continuous Slab Bridge (RCSB) and Workshop on Pilot Project (Nepal)

- Period: October 12-14, 2022
- Participants: 24 persons (from DOR)
- Major training components is shown as below:
  i) Outline of SROM2 Project
  ii) Introduction of Low-cost Bridge - Why RCSB is selected
  iii) Bridge Site Selection, Hydrological and Hydraulics Background
  iv) Quality Control & Record Keeping
  v) Staging Design
  vi) Site Visit to Pilot Bridge (Bhyakure, Mamti and Ghyampe)
  vii) Site Visit to Mulkot Bridge, Observation of Section 3 Road
  viii) Group Work and Presentation Related to Bid Documents and Procurement Method (Contractors)
  ix) Group Work and Presentation Related to Quality Control Method, Management, and Progress Control Method

(4) Equipment provision:

Equipment were provided as shown in Table 2.

Table 2 Equipment Provision

No.	Item	Quantity	
		Planned	Actual
1	Network HDD	1	1
2	Projector	1	1
3	Video Camera	1	1
4	Multi-Function Printer	1	1
5	PC	3	3
6	Anti-Virus Software	9	-
7	Auto CAD LT	3	-
8	Acrobat	1	-
9	UPS	3	3
10	Ink Jet Printer	1	1
11	Furniture	1	-

Source: JICA Expert Team

(5) Overseas activities cost:

None

1-2 Input by the Nepalese side (Planned and Actual)

(1) Counterpart assignment:

Counterpart assignment is summarized in Table 3.

Table 3 Counterpart Assignment

Organization	Position	Name	Period	
			From	To
DOR/DCID	Dupty Director General	Mr. Arjun Jung Thapa	25th April 2019	21st December 2020
	Project Director	Mr. Ram Hari Pokharel	30th July 2021	Present
	Sr. Divisional Engineer	Mr. Rupak Raj Bhandari	26th September 2019	2nd JCC only
		Mr. Ashish Thapa Magar	21st December 2020	30th July 2021
		Mr. Prakriti Pokharel	1st August 2022	Present
DOR/ SDDSBRP	Project Manager	Mr. Surya Bahadar Bhat	25th April 2019	21st December 2020
		Mr. Rabindra Lal Das	30th July 2021	Continued from 5th JCC
	Sr. Divisional Engineer	Ms. Radhika Prajapati	25th September 2022	Present
	Engineer	Ms. Shila Shrestha	25th April 2019	26th September 2019
		Ms. Bimala Dhami	25th April 2019	26th September 2019
		Ms. Gitanjali Koirala	21st December 2020	Present
		Mr. Sadhusaran Purbe	-	-
		Mr. Chhabi Paudel	25th April 2019	21st December 2020
		Mr. Trilok Ghimire (DCID)	25th December 2020	5th JCC only
		Mr. Karna Singh Khatri	2nd March 2022	6th JCC only
		Mr. Ananta Baral	7th December 2021	Present
		Mr. Gyanendra Prasad Kalauni	7th December 2021	Present
DWRI	Dupty Director General	Mr. Pradeep Thapa	25th April 2019	30th July 2021
		Mr. Sanjeeb Baral	1st August 2022	Present
	Sr. Divisional Engineer	Mr. Basudev Timilsina	25th April 2019	26th September 2019
		Mr. Birendra Yadav	26th September 2019	30th July 2021
	Engineer	Mr. Krishna Bahadur Pandey	25th April 2019	26th September 2019
		Mr. Mukesh Pathak	26th September 2019	30th July 2021
RBN	Exective Director	Mr. Krishna Singh Basnet	25th April 2019	26th September 2019
		Mr. Sushil Babu Dhakal	21st December 2020	-
		Mr. Sagar Gnawali	30th July 2021	-
		Mr. Prem Prakash Khatri	28th January 2022	31st July 2022
		Mr. Sagar Gnawali	1st August 2022	19th September 2022
		Mr. Ganesh Bahadur K C	20th September 2022	Present
	Technical Director	Mr. Sagar Gnawali	Commentment	2021 July
	Senior Engineer	Mr. Sanu Babu Prajapati	Commentment	Present

Source: DOR, DWRI, and RBN summarized by JICA Expert Team

(2) Provision of offices, etc.:

Offices provided by the Nepalese side are shown below.

1) Due to the Gorkha Earthquake last 2015, DOR was unable to provide the necessary office space because of the shortage of office space for DOR including its headquarters. Therefore, the JICA Expert Team (JET) worked in a rented office for 46 months.
2) Temporary workspace was provided by RBN for the convenience of activities related to toll road.
3) DOR provided the venue of the JCC meeting and seminars.

(3) Other items borne by the counterpart government:

1) Costs of Pilot Project Construction: NRS 166,644,047.79

Table 4 Features of Pilot Project

Description	Ghyampe	Mamti	Bhyakure
Location	Ch 111 + 400	Ch 113 + 900	Ch 119 +700
Contract Details:	Construction of Prestressed Concrete (PSC) Post – tensioned 2 webbed slab bridge on Ghyampe Khola (L-40m)	Construction of RCC Continuous Slab over Mamti Bridge (L=40 m)	Construction of Prestressed Concrete (PSC) Post – tensioned 2 webbed slab bridge on Bhyakure Khola (L-40m)
Contract Identification no:	SDSBR-33701132 – 2077/78-027	SDSBR-33701132 – 2077/78-028	SDSBR-33701132 – 2077/78-029
Name of Contractor	M/S Pacific Engineering Company Pvt .Ltd.	M/S Jaya Bishnu – Immanual – Gaurimai JV	
Contract Amount (NRS)	51,690,619.84	62,293,156.48	52,660,271.47
Contract Agreement Date	Oct 01, 2021	Oct 01, 2021	Oct 01, 2021
Intended Completion Date	Sept 30, 2023	Sept 30, 2023	Sept 30, 2023

Source: DOR edited by the JICA Expert Team

1-3 Activities (Planned and Actual)

(1) Results of Activities

Activity results are summarized as follows:

Output-1: Capacity to operate and maintain the Sindhuli Road is improved.

<u>Activity 1.1: Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI, and RBN</u>

- Implementation plan for Phase 2 was drafted with DOR, DWRI, and RBN in April 2019, and after the discussion about the Pilot Project implementation plan in 2nd JCC meeting, it was formulated.

<u>Activity 1.2: Prepare the Annual Road Maintenance Plan (hereinafter ARMP) including the budget in accordance with the implementation plan for the Phase 2</u>

- DOR classifies “Maintenance” in 5 types (Routine, Recurrent, Periodic, Preventative, and Emergency) and its definition is as follows.
  - Routine: Maintenance which is required continually on every road because of environmental degradation, whatever its engineering characteristics or traffic volume. (e.g. grass cutting, drainage clearing,

maintenance of bridge and culvert, maintenance of road facility)

- Recurrent: Maintenance which is required at varying intervals during the year with a frequency that depends mostly on the volume of traffic using the road. (e.g., repairing potholes, rut, road edge or shoulder, crack)
- Periodic: Maintenance which is required only at intervals of several years. (e.g., repainting of steel structure, refilling of shoulder, repainting of road sign, resurfacing)
- Preventative: Maintenance which is required to adapt the road to the changing nature of the slopes and streams. (e.g., slope netting, masonry wall, revetment, gabion wall and check dam installation)
- Emergency: Maintenance which is needed to deal with emergencies and problems calling for immediate action when a road is threatened or closed. (e.g., removal of debris and other obstacles, placement of warning sign and diversion works)

- Main contents of Annual Road Maintenance Plan ("ARMP") in the DOR is allocated budget, which is calculated based on road information such as length of each section and pavement conditions (Surface Distress Index (SDI) and International Roughness Index (IRI)).
- Objectives of ARMP in Sindhuli Road is as follows.
  - The main objective of the yearly planning is to reduce total transport cost by implementing planned maintenance scheme of various activities of Routine, Recurrent and Periodic Maintenance.
  - To identify the quantity of Recurrent and Specific Maintenance works to be done by the Project and estimate the required budget.
  - Prioritize the essential works to be done under Recurrent and Specific Maintenance works.
  - Screening and planning of the Periodic Maintenance.
  - Preparation of work implementation calendar as well as planning of vehicle and equipment.
- Allocated budget was likely to be insufficient for the Sindhuli Road Office, as the office is installing traffic safety facilities and overlay pavement based on the Phase 1 policy, and budget for the pilot project of three bridge construction is also required. Therefore, ARMP was developed with the JET advise DOR of taking the necessary action to implement this project without hindrance.
- Allocated budget from FY 2018/2019 to FY 2021/2022 is summarized in the following table. The allocated budget for FY 2020/2021 was decreased due to

the COVID-19 pandemic. However, the budget increased in FY 2021/2022. Toll road maintenance budget is added from FY 2020/2021 by the introduction of toll road collection in the Sindhuli Road.

Table 5 Annual Budget of ARMP from FY2018/2019 to FY 2022/2023 (NRS)

Source of Budget	Maintenance Activity	Allocated Budget for FY2018/2019	Allocated Budget for FY2019/2020	Allocated Budget for FY2020/2021	Allocated Budget for FY2021/2022	Allocated Budget for FY2022/2023
RBN	Routine Maintenance	18,974,000	21,475,000	17,715,000	17,715,000	40,400,000
	Recurrent maintenance	21,314,000	17,000,000	7,352,000	7,352,000	4,000,000
	Periodic Maintenance	80,000,000	112,861,860	65,100,000 146,840,000	265,140,000	47,200,000
	Emergency Maintenance	500,000	2,000,000	3,440,000	2,500,000	3,600,000
	Specific Maintenance	10,000,000	10,513,170	10,000,000	10,000,000	16,100,000
	Road Traffic Safety works	4,000,000	4,903,050	6,200,000	4,000,000	2,500,000
	Bridge Maintenance	-	-	-		
	Bio-Engineering	-	-	-		2,000,000
	Reactive Maintenance	-	-	-		
	Responsive Maintenance	-	-	-		
	Road Side Maintenance	-	-	-		
	Rehabilitation	-	-	-		
	Toll Road Maintenance			78,070,000	90,270,000	
GON (DOR Budget)	GON budget is for on going Project having activities such as reconstruction/Rehab, resettlements,major repair works including administrative expences	359,200,000	465,700,000	245,000,000	630,000,000	683,300,000
Total		493,988,000	634,453,080	579,717,000	1,026,977,000	799,100,000

* Expenditure for this periodic maintenance works was paid by Central Regional Office, DOR, GON for its 90% and by World Bank for its 10%.

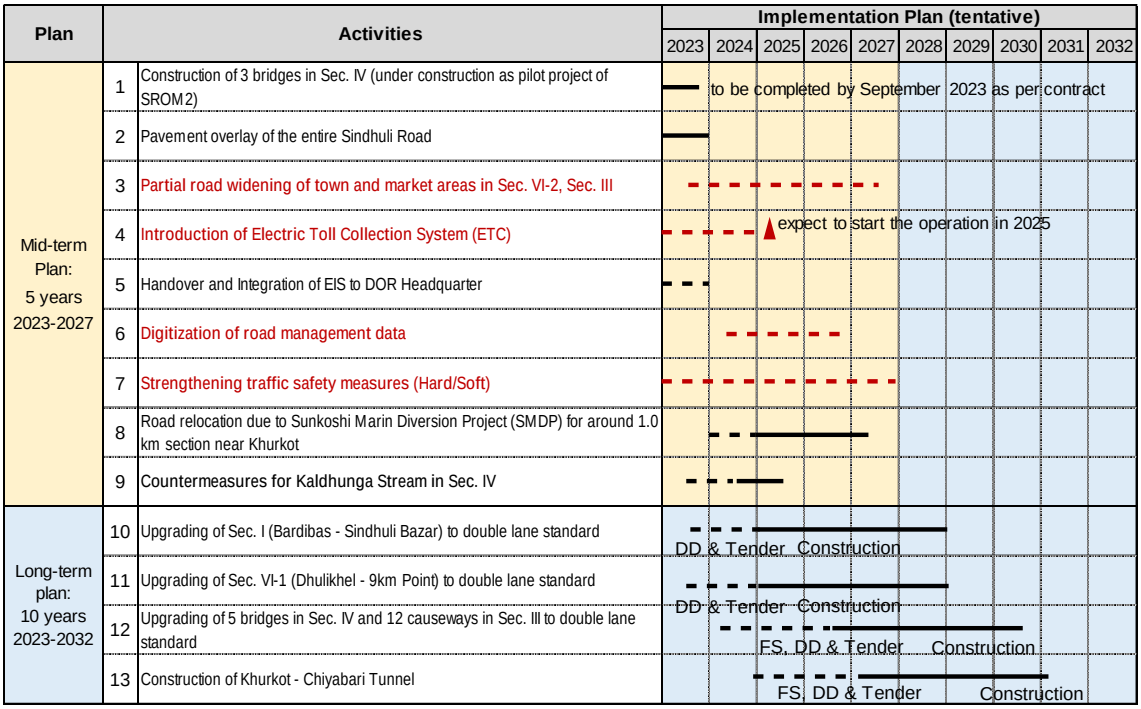
Source: ARMP edited by the JICA Expert Team

Activity 1.3: Formulate the Mid/Long-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project

- Mid/Long-term operation and maintenance plan was prepared in December 2022 which is the end of the Project and contents was confirmed between JET and CPs at 8th JCC meeting. After discussion with DOR, Mid/Long-term operation and maintenance plan was finalized and re-submitted to DOR. DOR and other CPs will conduct maintenance work along Sindhuli Road based on the plan after the Project end.
- In the Mid/Long-term operation and maintenance plan, projects to be implemented in the mid-term (5 years) and long-term (10 years) plans, respectively, were formulated on the premise that the Sindhuli Road would not

be a main trunk road connecting Kathmandu and the Terai Plains in the future, but a supplement to the Fast Track Project Road, maintaining stable road functions in terms of safety and transportation. The main contents of the Mid-term and Long-term plans and the proposed implementation schedule are shown in Figure 1.

- Regarding budgetary measures to implement the plan, it is assumed that the contents of the Mid-term plan are of a scale that can be covered by Nepalese funds and can be covered by appropriations in the ARMP. However, Nepal has no knowledge of the introduction of a toll road system written in the Mid-term plan, so that technical assistance is required. The Long-term plan, on the other hand, is of a scale that will require international donor support.



Source: JICA Expert Team

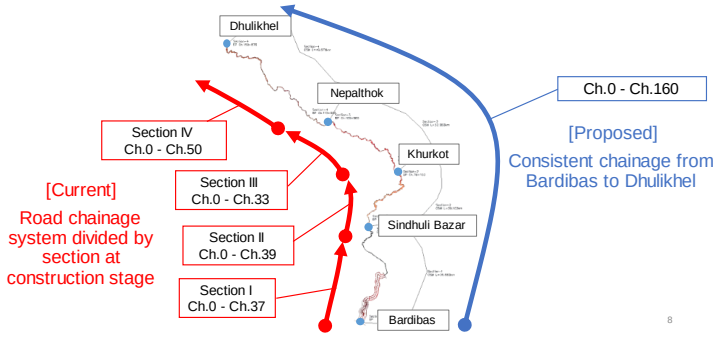
Figure 1 Implementation Schedule of Mid/Long-Term Operation and Maintenance Plan

Activity 1.4: Update the hazard map and road inventories of the Sindhuli Road

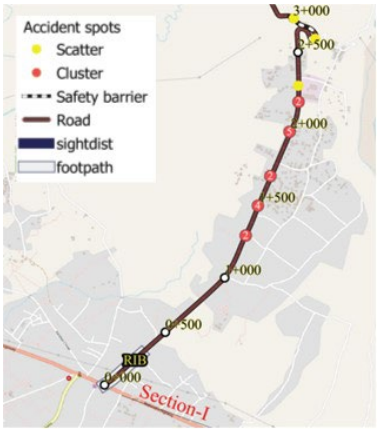
- JET has collected the current road inventory and hazard map and verified. Then, it was found that the data was not in a useful state for routine road management. The road chainage system of the Sindhuli Road was reviewed. Based on the construction period, the road chainage has been divided into

four, and each section has its individual road chainage starting from zero. Since each Section has an individual road chainage from CH0+000, 4 identical chainage are generated, making it difficult to determine the location of the Sindhuli Road, which is necessary for data management and traffic control.

- Although the DOR side was aware of the need to establish new chainage when they started maintenance activities after the completion of the Sindhuli Road, they continued their daily maintenance activities without any change.
- In view of this situation, JET proposed that chainage used in hazard maps and road inventory should be used continuously from Bardibas to Dhulikhel to ensure smooth maintenance activities of the Sindhuli Road in the future. And proposed chainage is that Bardibas should be the starting point (CH0+000) and Dhulikhel should be the ending point (CH 160+000) in the project.
- For a more efficient management in the future, it was proposed that various road information related to road management shall be collected in a single format, such as road chainage, pavement conditions, hazard information, and traffic safety. The key to realizing that ideal system is the introduction of a digitized integrated map. JET proposed during the 6th JCC meeting to aim for the development of this system in the mid-term plan.
- The digitalized road inventory is expected to be used for various activities. This is not only for road maintenance and repair, but also for planning road safety facilities.
- Regarding the updating of hazard maps and changing the road chainage in the road inventory, it was proposed that the relevant system development be developed and maintained in the Mid-term operation and maintenance plan. It is agreed with DOR that the changes will be made collectively when the above-mentioned digitization is done.



Management Method of Road Chainage



Proposed Road Inventory Map

Source: JICA Expert Team

Figure 2 Proposed Road Inventory

Activity 1.5: Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP

- Routine, periodic, specific, and emergency maintenance works have been conducted according to the ARMP and its definition is written in Activity 1.2. Road maintenance work conducted by DOR is shown in Figure 3 and detail works are written as follows.
  - Figure 6-1: The following is a picture of drainage ditch cleaning activities conducted as part of the routine maintenance. The length workers shown in Figure 4 are assigned to the areas they are in charge of at road chainage section, and they routinely clean the areas they are in charge of.
  - Figure 6-2: This is a photo of pothole repair as part of recurrent maintenance. When a pothole or other damage is discovered by the Length Worker during routine maintenance, repair work is planned and contracted to a local contractor for repair several times a year.
  - Figure 6-3: This is an example of how paved roads are resurfaced as part of periodic maintenance. Until the resurfacing cycle is set by Nepalese standards, resurfacing is to be done every 5 years in Terai and every 6 or 7 years in other hill.
  - Figure 6-4: This is an example of emergency maintenance, which is the removal of sediment that has flowed due to a landslide or other disaster. Emergency maintenance involves deploying the necessary personnel and

equipment to lift road closures as soon as possible, and constructing temporary detour routes to allow traffic to pass through.

1. Routine Maintenance

2. Recurrent Maintenance

3. Periodic Maintenance

4. Emergency Maintenance

5. Emergency Maintenance

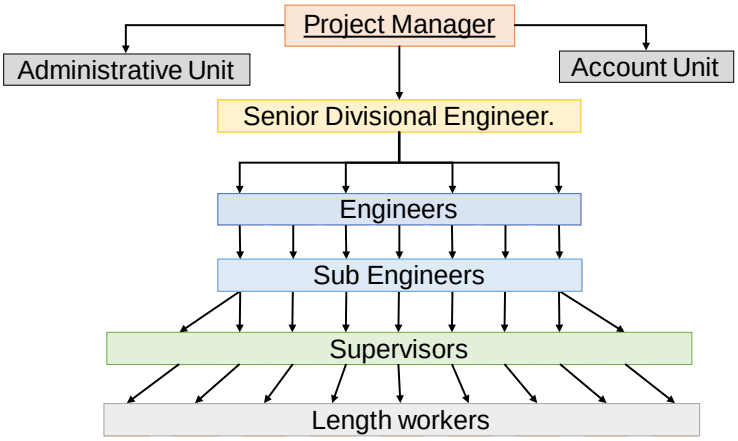
6. Example of Slope Protection Work

Source: JICA Expert Team

Figure 3 Road Maintenance Work by DOR

- The organization chart for road maintenance activities of the Sindhuli Road Office is shown in Figure 4. The Project Manager oversees the entire project. Three or four engineer classes are assigned and are responsible for each

road section or major construction project. In addition to maintenance during normal times, the engineers and sub-engineers are responsible for mobilizing the necessary equipment and personnel in the event of an emergency. In the event of a road disaster or road closure, the engineers, with the approval of the project manager, instruct their respective section supervisors to carry out maintenance and repairs or to open the road. In addition, hired local worker (length workers), who are assigned to each road section of several kilometers, are in charge of daily inspections and cleaning.



Source: ARMP edited by the JICA Expert Team

Figure 4 Organization Chart for Sindhuli Road Office

Activity 1.6: Conduct improvement works of the Section 4 of the Sindhuli Road by a pavement overlay including a partial widening

- Overlay Pavement

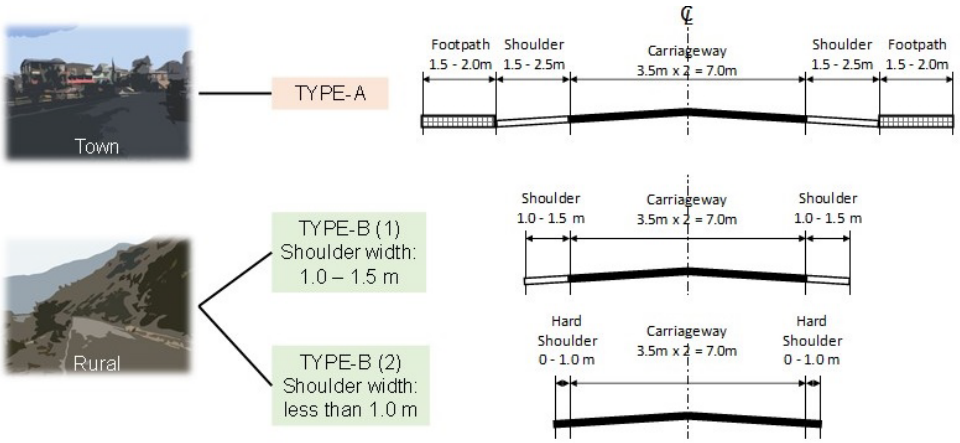
- DOR conducts an annual survey of the Pavement Surface Damage Index (SDI), which indicates the degree of damage to the pavement surface, and reflects the degree of damage in its pavement rehabilitation plans. SDI is measured by using teams of individuals who drove across every mile of pavement to be measured. Speeds were usually quite slow (on the order of 16 km/hr (10 mph)) and measurement was done visually. In Sindhuli Road, a simple asphalt pavement called DBST is applied to reduce construction cost at the time of construction phase. Particularly in Section 4, due to the increase in traffic volume and the time that has passed since the pavement was laid, potholes, cracks, and peeling of the pavement is observed. Therefore, Sindhuli Road Office is proceeding with the overlay pavement work with asphalt concrete in Section 4 as the priority section in accordance with the

ARMP.

- Asphalt Pavement technical lectures were conducted in July 2019, and the technical report was submitted in July 2019. Technical training on “Asphalt Concrete Mix Design and Quality Control in Pavement Construction” was conducted from February 14 to February 18, 2021 with 13 persons from DOR. As of the time of project completion, 44 km of pavement overlay works in Section 4 have been completed.
- At the time of completion of this project, the pavement overlay work in Section 4 (60 km), from Dhulikhel to Bakundebesi (25 km), has been completed, and the remaining section from Bakundebesi to Nepartok (35 km) will be implemented in the Mid-term Plan after completion of this project.

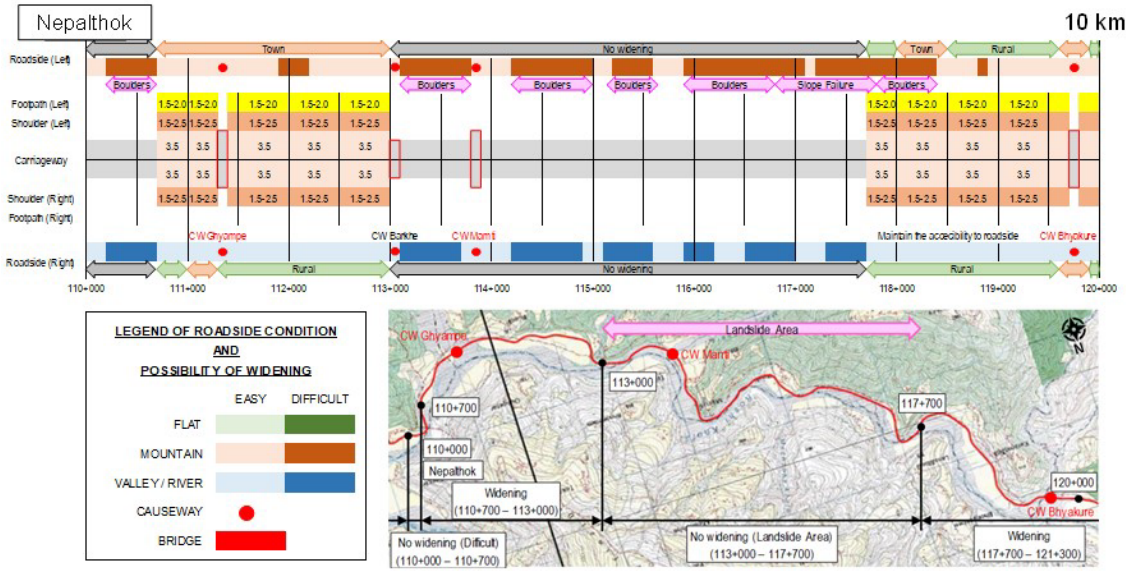
➢ Partial Widening

- The partial widening in this project was envisioned to improve the sight distance on the inside of the curve at the curved section. However, after discussions with DOR immediately after the start of this project, it was confirmed that DOR envisioned more large-scale widening of Sindhuli Road, including double lane. Since it was difficult to implement the widening intended by DOR in this project due to budget and process constraints, this project conducted a preliminary study on the technical feasibility of partial widening based on the road conditions.
- Preliminary survey was firstly conducted to identify the possible section of partial widening for Section 4 in September 2019 and show the future direction of road widening. After this, the survey coverage length was expanded to the entire section of the Sindhuli Road, and the comprehensive report entitled “Preliminary Survey Report for the Road Improvement Plan” was prepared and submitted to DOR in March 2020.
- Since the traffic volume on the Dhulikhel - Bakundebesi section of the Section 4 is already far exceeding the traffic capacity of a 1.5-lane road, JET proposes the early conversion to double lanes on the 9 km section from Dhulikhel in the Mid-term plan after the completion of this project. In order to prevent further damage of the road, the pavement condition is proposed to be continuously checked, and repair work is proposed to be carried out while potholes are small (before the damage becomes more extensive).



Source: JICA Expert Team

Figure 5 Recommended Widening Pattern



Source: JICA Expert Team

Figure 6 Example of Application Cross Section Type

Activity 1.7: Conduct countermeasure works against water-induced disasters beyond the right of way by DWRI

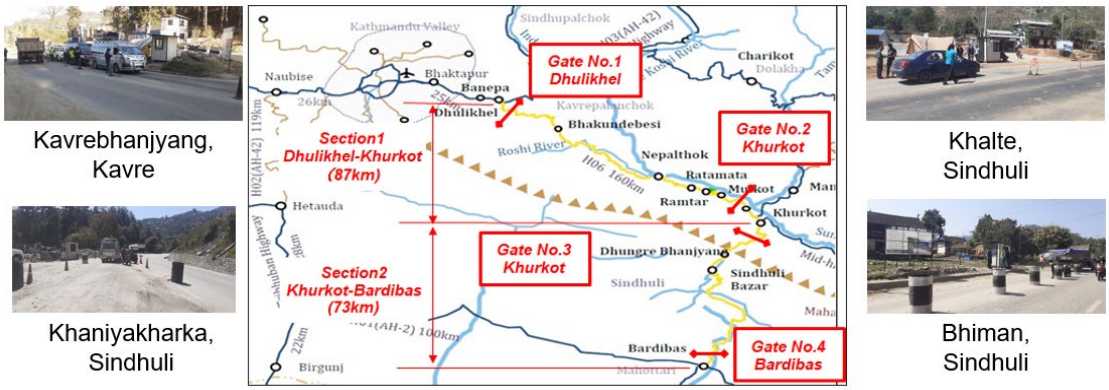
- Bhalu Bridge which is located along Sunkoshi River (Section 3) has concern of slope failure as Figure 7. To prevent collapse of embankment, slope protection work was conducted by DWRI. Thus, bank protection works at Gwang River in Section 1 were also conducted with DOR and DWRI during the Project period.

Source: JICA Expert Team

Figure 7 Slope Protection Work at Bhalu Bridge

Activity 1.8: Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN

- On April 15, 2019, GoN decided to introduce toll road system on 11 major routes across the country to secure road maintenance budget. The Sindhuli Road was selected as one of these routes, and the toll road system was introduced in September 2019 in two sections. The first section is from Dhulikhel to Khurkot (for approximately 90 km) and the second section is from Khurkot to Bardibas (approximately 70 km).



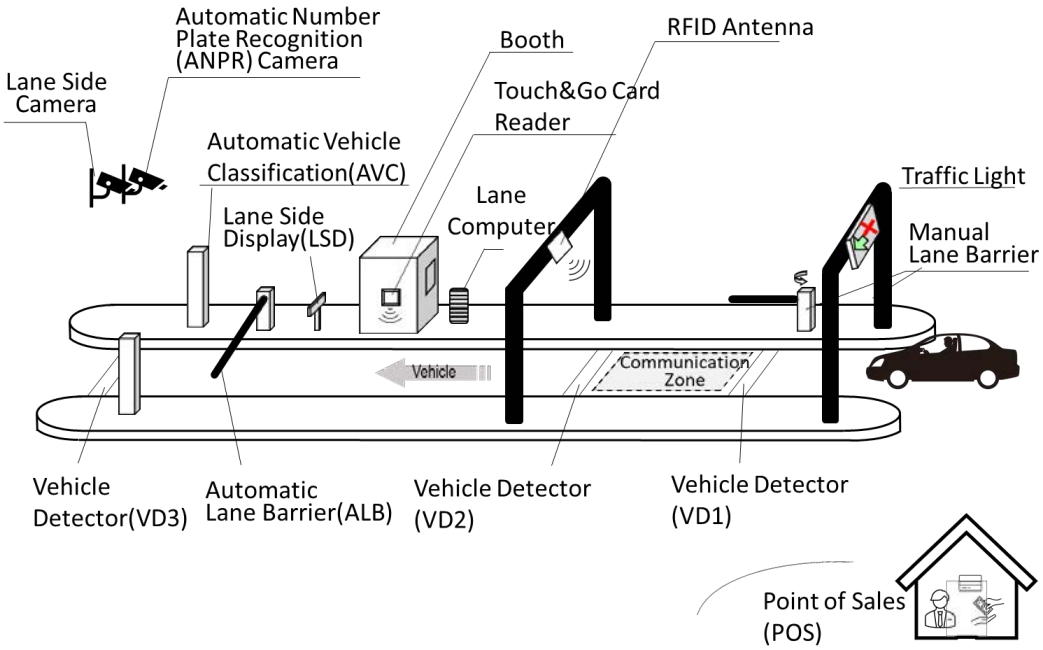
Source: JICA Expert Team

Figure 8 Toll Road System in Sindhuli Road

- On September 16, 2020, RBN announced the bidding for the Electronic Toll Collection (ETC) system named Hybrid Electronic Toll Collection (HETC), but the bidding was canceled on July 1, 2021. With this situation, RBN requested

JICA to support the introduction of the ETC system in the 6th JCC meeting held on March 2, 2022.

- The survey was conducted to collect information to introduce the ETC system, which is most suitable in Nepal. The remarkable conditions of the Sindhuli Road for introducing ETC are the existence of mix road users of roadside residents and through traffic. The proposed system consists of two different passing methods for exempt and non-exempt vehicles, as represented in the illustration below. “Touch & Go” system is adopted for the collection from non-exempt vehicles, while exempt toll fee for residents is applied using RFID method.



Source: JICA Expert Team

Figure 9 Proposed ETC System in Sindhuli Road

Activity 1.9: Convene regular meetings and monitoring for road operation and maintenance

- Monthly joint meetings and joint site visits were held to share the progress and issues related to each activity. Since it has become difficult to hold frequent meetings due to the COVID-19 pandemic, JET has shared progress through online meetings and verified on-site situation through the use of drones.

Internal Meeting

Joint Site Visits

Source: JICA Expert Team

Figure 10 Photo of Internal Meeting and Joint Site Visits

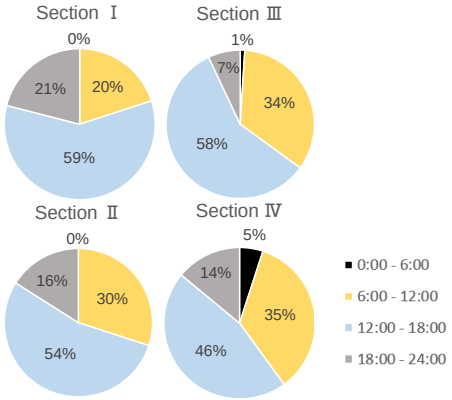
Output-2: Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.

Activity 2.1: Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents

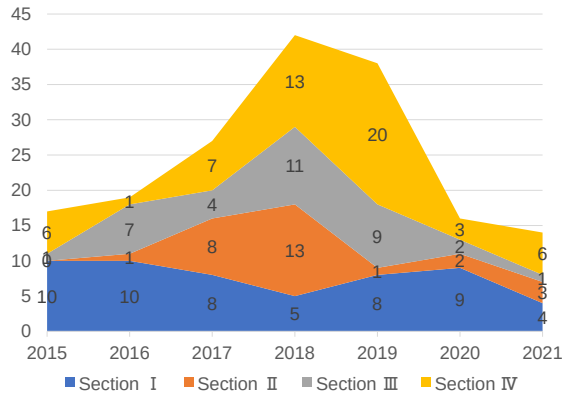
- The JET has collected, and organized data sheets of each individual accident record prepared by the local traffic police. Collected road accident data was from the year 2015 to 2022. Based on the location information recorded in the accident sheet, the accident locations were put into a GIS-based map to visualize the frequent accident spot.
- Although the cause of each accident cannot be exactly identified, according to the hearing from Traffic Police, DOR and local residents, it was pointed out that many of the causes were due to over speeding by drivers in addition to road structural problems. Analyzing from the accident record, motorcycle accidents in Section 1 where topographic is flat and easy to over speeding are the most cases.
- Compared with the time zone, most of the accidents happened in the daytime (6am to 6pm). It could say that the accident number has consistency with hourly traffic volume. Furthermore, in urban area, traffic accident ratio increased at nighttime when visibility is poor, and the characteristics is different from Sindhuli Road.
- These result is reported in the JCC meeting and traffic safety workshop.

Plotting of traffic accident location

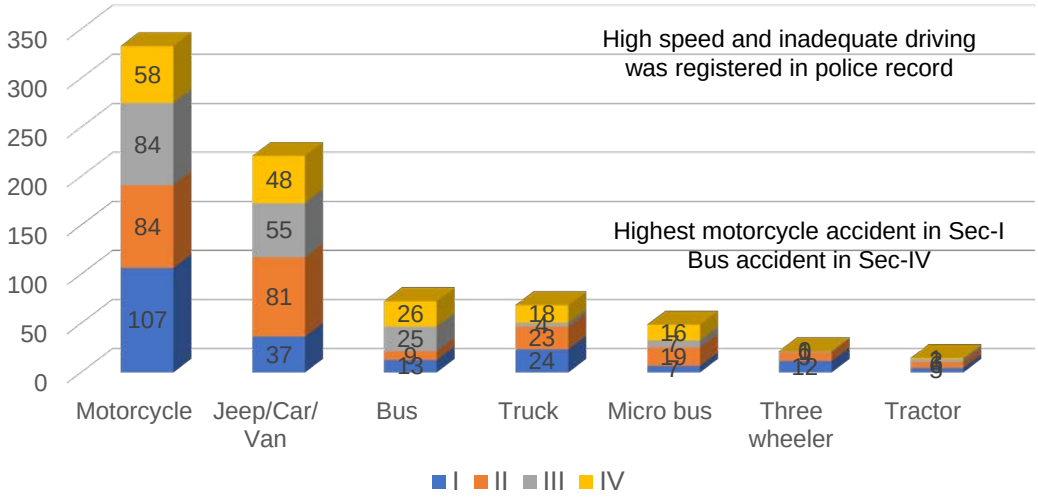
Accident of head-on collision



Distribution of traffic accident by hour



Fatal accident number by year/section



Traffic accidentnumber by vehicle type/section

Source: JICA Expert Team

Figure 11 Occurrence Rate of Traffic Accident in Sindhuli Road

Activity 2.2: Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay-by, etc.) in accordance with the above analysis and the Road Safety Management Plan

- Traffic safety management plan, which was prepared in Phase 1, was revised according to the current traffic condition. The result was summarized as “Traffic Safety Improvement Plan” and submitted in September 2022 to DOR.
- In Phase 1, road safety measures such as intersection improvements, Road Information Board (RIB) installation, solar stud, bus lay-bys, and sidewalks were proposed and implemented specifically for the Section 4. Therefore, in Road Improvement Plan, it is proposed each section with the objectives of reducing head-on collisions, reducing vehicle falls, driving comfort, and improvement of pedestrian safety. The proposals for each section are summarized below (Extract of traffic improvement plan are summarized in Table 6).
  - Section 1: Partial widening, securing footpath
  - Section 2: Installation of stopping lay-by due to restriction of topographic condition
  - Section 3: Installation of stopping lay-by due to restriction of topographic condition
  - Section 4: Partial widening, improvement of sight distance, removal of plants, installation of curve mirror, installation of vehicle fall prevention facility and stopping lay-by
- From the proposed Road Improvement Plan, installation of footpath are conducted in the Project period. Footpath installed in Section 1 is shown in Figure 12.
- For others, such as partial widening or road safety facilities are proposed to conduct in Mid/Long-term operation and maintenance plan.

Source: JICA Expert Team

Figure 12 Footpath Installed in Section 1

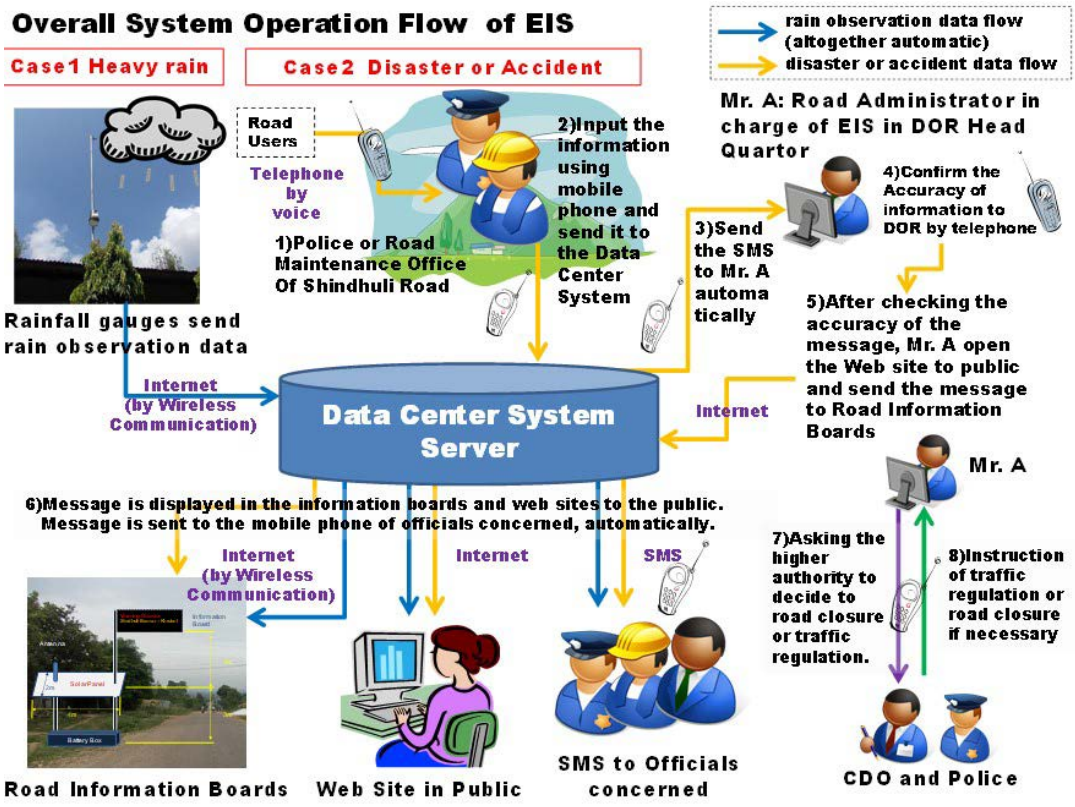
Table 6 Example of Traffic Safety Improvement Plan (Section 1)

Chainage	Road Shape	Existing Facility	Accident-Prone Vehicle Type	Accident Number (2015 to 2021 June)	Fault of the Accident	Remarks/Recommendation
0 to 5	Gentle curve, Sharp bend at (CH 2+700) and 4 lane carriage way 0+000- 0+400 m)	Foot path/Bus lay-by (300m) /traffic sign, Road marking crash barrier in some location	13 Motorcycle	15	High speed, drivers' negligence, no walkway (footpath) for pedestrian	(High Pedestrian flow up to 2+500), Additional foot path, improvement of alignment at 2+500, speed limit sign (40 Km) and repair of crash barrier at CH 2+700
5 to 10	Curve and sharp bend at (CH 5+950)	Road pavement (fair) traffic sign, delineators, crash barrier (some location), Zebra crossing in some location	21 Motorcycle	36	High-speed, head-on collision, no walkway (footpath) for pedestrian	Guard blocks/crash barrier, speed limit sign (40 Km)
10 to 13	Curve section	Poor road pavement, no traffic sign and two zebra crossings only	10 Motorcycle	15	High-speed, head-on collision	Install speed reduction, warning sign and road markings
33 to 35	Curve section (Entering to Sindhuli Bazar)	Poor road pavement, few traffic sign and crash barrier	Light vehicle	9	High speed, reckless driving	Install gate way entry sign (Before entering to urban area), 25 Km speed limit sign

Source: JICA Expert Team

Activity 2.3: Operate and maintain the EIS (Emergency Information System) and provide the additional EIS along the Sindhuli Road for convenience of road users

- EIS which was installed in Phase 1 consists of three components, namely: 1) Data server, 2) Automatic rainfall stations, and 3) RIB and overall system was planned to be operated as Figure 13. The operation and management of the EIS was supposed to be carried out by the Sindhuli Road Office, however, an investigation revealed that it was not being operated properly. The direct causes were damage to automatic rainfall gauges, inadequate communication facilities, and damaged batteries. In addition, there was no person in charge of EIS management for a period of time, resulting in a lack of succession, and as a result, RIB messages were missing or the same messages were always displayed.



Source: JICA Expert Team

Figure 13 Overall System Operation Flow of EIS

- Issues on EIS were identified and measures for the improvement of the situation were suggested to DOR at the beginning phase of the Project. Details of issues and the measures were presented to DOR in November

2021 as named of Assessment of the EIS status, issues and recommended measures for restoration. In particular, the project was to add batteries and solar panel facilities, connect to the wire network, and update inverters and telecommunication facilities, depending on the condition of each location. However, these facilities were not updated and proper operation of the EIS resumed during the project period.

- The EIS was proposed to be handed over to the central unit of DOR, such as the Highway Management Information System (HMIS) during the JCC meetings. The purpose and objectives of the handover are as follows:
  1) The EIS consists of a data server to host the system on the web (internet). When the EIS was installed, the DOR did not have proper server infrastructure. That was the reason why the data server was not handed over to DOR. Currently, DOR has good server infrastructure, which can host the contents of the data server. Therefore, as envisaged in the beginning, the system should be operated under the responsibility of the central unit of DOR.
  2) Different projects and divisions under DOR have installed RIBs. The Sindhuli Road cannot look after the RIBs. Therefore, the central unit must look after these RIBs as well as all the EIS infrastructures to be installed in the future.
  3) Central unit of DOR can also plan the future expansion of EIS as recommended during Phase 1 and Phase 2.
- A letter was sent on November 23 2022 to the Project Director (DDG and DCID) for the handover of EIS to the DOR central unit. The Project Director sent a letter on November 27 2022 to the Planning and Monitoring Branch of DOR requesting to take further steps regarding the handover. Further discussions will take place with the concerned authorities and a handover plan will be suggested to DOR.
- Two additional RIBs were proposed to be installed at Khurkot to serve the road users along the Sindhuli Road as well as those coming from Mid-Hill Highway. The exact location of the two RIBs was suggested by visiting the site along the Sindhuli Road Project. An estimate for the construction of RIBs was submitted to the DOR (Sindhuli Road Project) based on the completion of the installation work in February 2022.

Additional Installation of RIB (Khurkot)

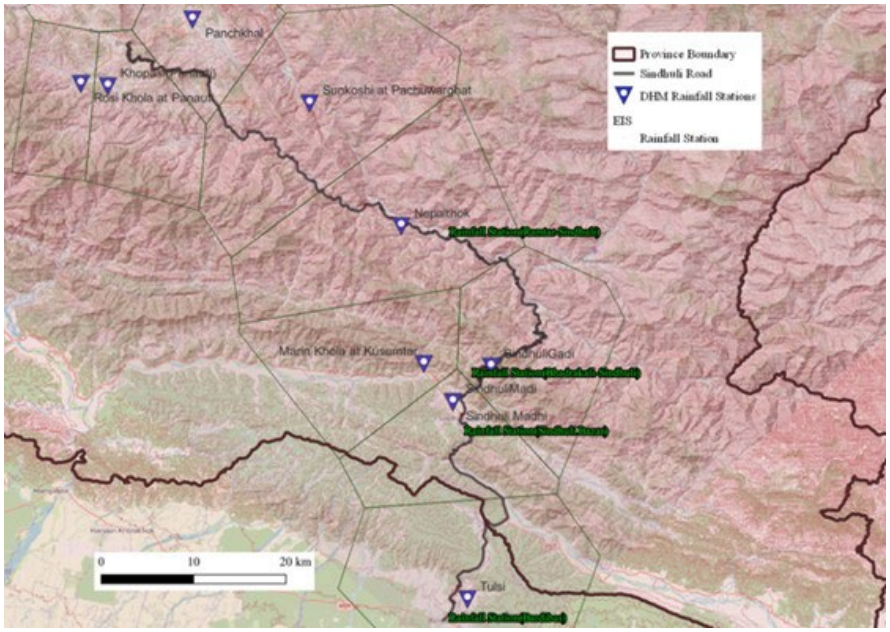
Photo after Installation of RIB

Source: JICA Expert Team

Figure 14 Additional Installation of RIB

Activity 2.4: Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local authorities

- During Phase 1, rainfall station was installed at the location shown in Figure 15. While studying the issues of EIS, these rainfall stations were found to be not working for many years. The main cause was judged that not placing the responsible person or not sufficient management system for rainfall station. In response to the issues of EIS, suggestions were made to the Sindhuli Road Project to improve management and maintenance system of the rainfall stations.
- The existing criteria for the rainfall-based warning system is based on Japanese standard and criteria itself is sufficient. Therefore, it is efficient to repair the rainfall station as soon as possible and collect the data continuously for 5 to 10 years. From the collected data, warning criteria shall be reviewed.
- On the other hand, it is necessary to review the warning criteria to have a versatility system considering future expansion of EIS to trunk road. From the above point of view, it is proposed that DOR needs to cooperate with Department of Hydrology and Meteorology (DHM) to reflect rainfall characteristics of all over Nepal by utilizing nation-wide rainfall data collecting from rainfall station which DHM has.



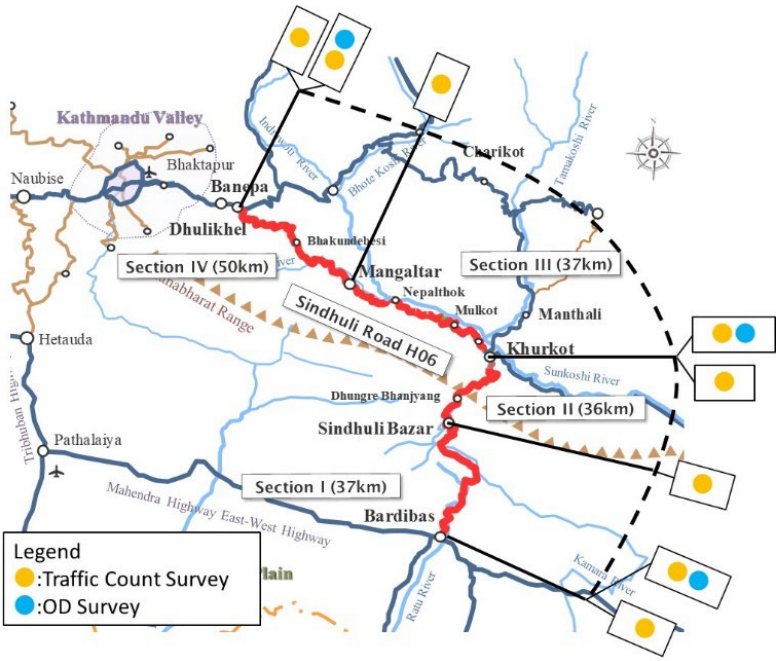
Source: JICA Expert Team

Figure 15 Location of Rainfall Station to be Applied in Sindhuli Road

Activity 2.5: Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.)

- Traffic survey along the Sindhuli Road was conducted twice, in June 2019 and May 2022. After the survey finished, report was submitted to DOR and JICA.
  - Final Report of Traffic Survey 2019 (August 2019)
  - Final Report of Traffic Survey 2022 (August 2022)

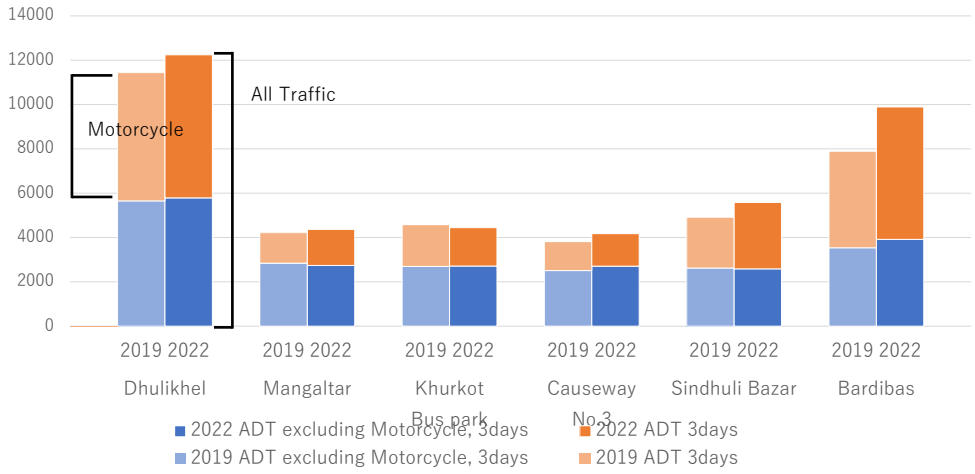
- Traffic count survey, Origin-Destination survey, and speed running survey were conducted. Location map of traffic survey is shown in Figure 16.



Source: JICA Expert Team

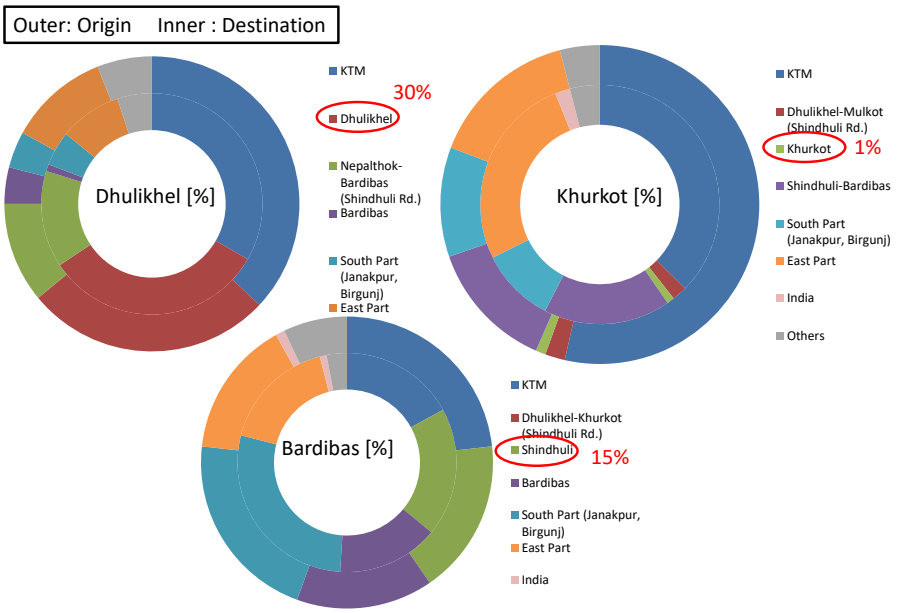
Figure 16 Location Map of Traffic Survey (Traffic Count Survey, OD Survey)

- Traffic volume comparison (2019 vs 2022) is shown in Figure 17. Almost half of the vehicle type is motorcycle. In comparison of traffic volume of 2019 and its 2022, traffic volume increased about 7% in Dhulikhel and about 25% in Dardibas.
- OD survey results are shown in Figure 18. At Dhulikhel where the entrance of Sindhuli Road, about 30% of origin and destination traffic could confirm. On the other hand, at Khurkot, most of the traffic is long distance transportation which the origin or destination is distant area such as Kathmandu, Bardibas or east part of Nepal.



Source: JICA Expert Team

Figure 17 Traffic Volume Comparison (2019 vs 2022)

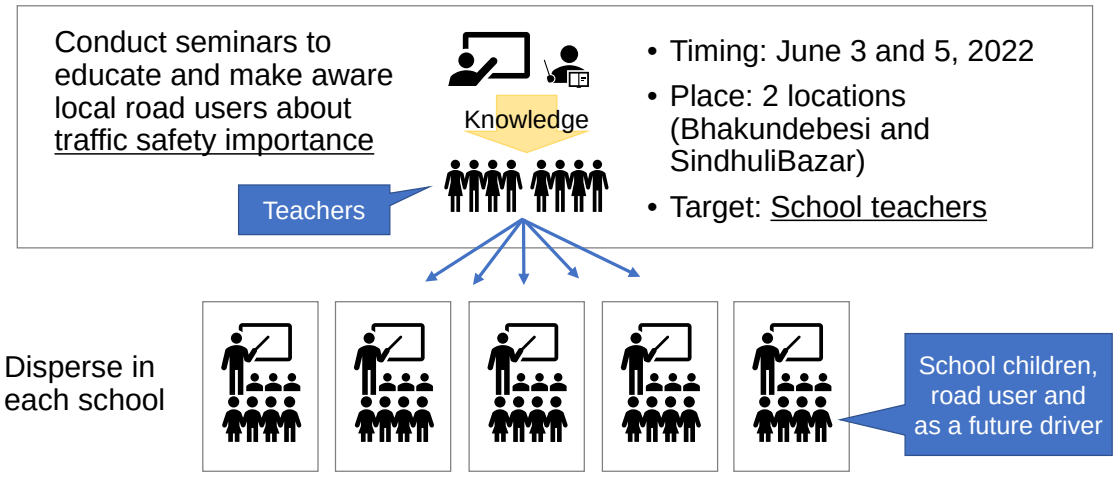


Source: JICA Expert Team

Figure 18 Detail of OD Survey

Activity 2.6: Prepare the education materials (e.g., leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct awareness and education activities (e.g., education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities

- Presentation material and movie for traffic safety campaign based on actual traffic safety countermeasure or traffic accident data in Sindhuli Road was prepared.
- Road Safety Awareness Training for School Teachers was conducted on June 3 and June 5, 2022 for 50 school teachers (from 30 different schools located in the Sindhuli Road corridor). As shown in Figure 19, purpose of the seminar is by conducting traffic safety seminar to schoolteachers will make continuous traffic safety campaign to school children, road user and as a future drier based on “Training of Trainers” concept.



Source: JICA Expert Team

Figure 19 Outline of Training for School Teachers and Concept of Training of Trainers

- The following educational materials were prepared and distributed to the schoolteachers along the Sindhuli Road. Education materials distributed to schoolteachers and seminar photo are shown in Figure 20.
  - Play card set: Containing 15 different color play cards with different road safety slogans with interactive cartoons pictures
  - Poster: Displaying different road traffic signs and signals
  - USB stick: Containing all the PPT materials, audio, and video clips used in the training program
  - T-shirt: Printed with road safety slogan and photogram of Sindhuli Road
  - Book: How to use the road safety published by DOR

Play card

Poster/T-shirt

Seminar

Group Photo

Source: JICA Expert Team

Figure 20 Education Materials and Photos of Seminar

Activity 2.7: Conduct a sharing workshop on road traffic safety

- Traffic safety workshop was conducted jointly with DOR and JET on December 16, 2022. There were 66 participants from the MoPIT, DOR, RBN, DOTM, Traffic Police Office, World Bank Nepal, Asian Development Bank Nepal, WHO Nepal, Nepal Red Cross Society, and IFRC.
- The program was set to be able to understand the road safety status of Nepal and its traffic safety management plan. Thus, a group work was conducted to consider and discuss traffic accident analysis, countermeasures against traffic accident, and sustainable safety awareness activity in the Sindhuli Road. Participants and organizers also had a discussion regarding the future traffic safety in the Sindhuli Road.

Groupwork

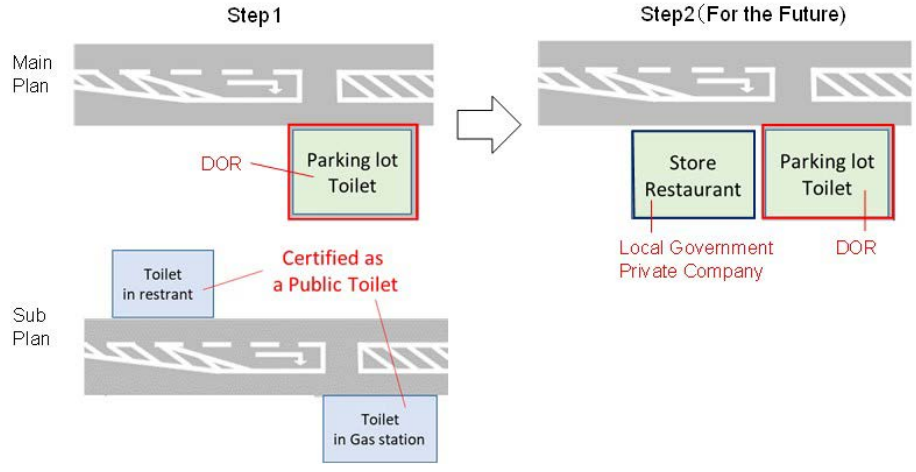
Group Photo

Source: JICA Expert Team

Figure 21 Photo of Traffic Safety Workshop

Activity 2.8: Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road

- In the future, it is recommended to install a “Michi-no-Eki” along the Sindhuli Road. This is a multi-purpose facility that serves not only for tourists but also for social and economic activities in the local community.
- Pre-feasibility study was conducted for providing roadside facilities with the following concept:
  - The Rest Area will be a multi-purpose facility that will contribute to the social and economic activities of residents as well as tourists.
  - Provide good quality resting facilities as road traffic safety facilities for road users considering domestic and foreign tourists.
  - Proposed Facility Expansion Plan by step
    Step 1: parking lots and toilets are provided as road traffic safety facilities.
    In the future
    Step 2: stores or restaurants are provided as profitable facilities.
  - Implementation Plan: Operation and maintenance of the installation are performed by DOR, the local government, and private companies. Four locations along the road were proposed as potential sites. The most promising site was proposed near Kulkot bus stop, a major transportation hub at the intersection of the Sindhuli road, the Kulkot-Mantari road, and the Mid-Hill Highway.



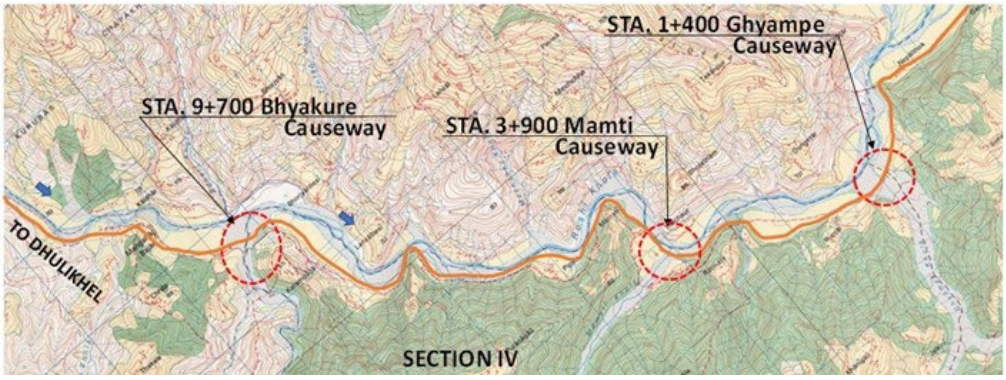
Source: JICA Expert Team

Figure 22 Development Plan of Rest Area

Output-3: Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.

Activity 3.1: Conduct the site survey of the Sindhuli road and select the sites for pilot project

- Damaged sites of causeway/roadway in Section 4 of Sindhuli Road were recognized in 2017 through the preliminary survey for the Project for the Operation and Maintenance of the Sindhuli Road Phase 2 and proposed restoration on R/D in April 2018.
- Three damaged causeways, in the Ghyampe, Mamti, and Bhyakure Khola sites, were selected to be upgraded to bridges (as requested by DOR) at the 1st JCC meeting.
- DOR requested from the JET that these pilot projects shall consider bridge structures based on the Nepal Standard Design Specifications and transfer the bridge technology including bridge design.



Source: JICA Expert Team

Figure 23 Location Map of Pilot Project at Section 4

Activity 3.2: Conduct the natural condition surveys including EIA, Topo and geological investigations

- After the preliminary evaluation for the site selection from five candidate sites, topographical survey was conducted at the sites of Ghyampe Khola (Ch.111+400), Mamti Khola (Ch.113+900), and Bhyakure Khola (Ch.119+700) from May to July 2019.
- Geological investigation was conducted 2 borings at Bhyakure Bridge and Ghyampe Bridge, respectively. At both location, gravel is recognized until 16m and ground water level was 12.5m, respectively.
- The hydrological and hydraulic study, planned flood volume estimate and debris flow analysis for three bridge sites were conducted. The results were approved by DOR.

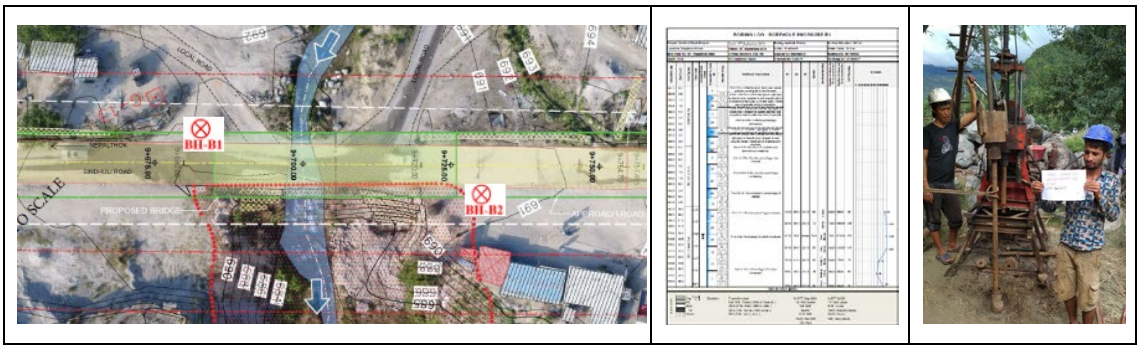
- Initial Environmental Examination (IEE) for the construction of the Ghyampe, Mamti, and Bhyakure bridges, including approach roads, was conducted and approved by MoPIT on April 24, 2022. Most of the adverse impacts identified in the IEE were limited to the area and duration of construction, and with implementation of the proposed mitigation measures, there was assessed to be no risk of residual impacts on the physical, biological, socioeconomic, and cultural environment of the subject area.

Table 7 Quantity of Survey (for 3 Bridges)

Item	Qty.
Preparation of Work	1 LS
Benchmark Installation	12 nos.
Topographic Mapping	0.249 Sq. km
Cross Sectional Survey	3,200 m
Preparation of Report	1 LS

Source: JICA Expert Team

Figure 24Survey Photo and Final Outcome



Source: JICA Expert Team

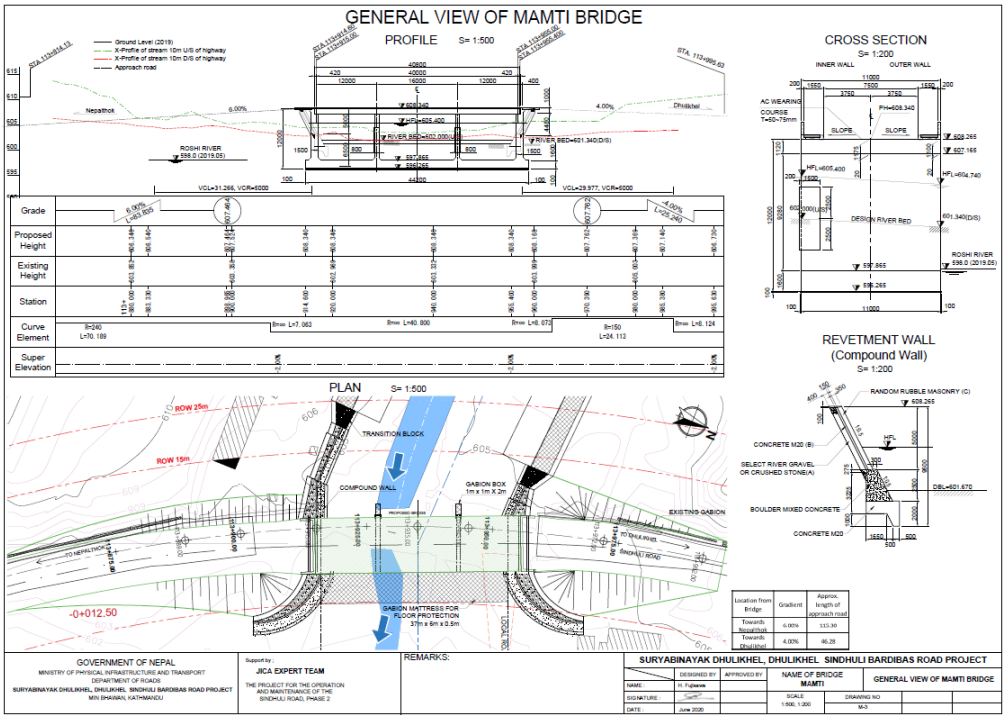
Figure 25 Outline of Geological Survey (Location, Borehole Log and Survey Photo)

Activity 3.3: Prepare the design, cost estimation and tender documents for the pilot project

- Based on Activity 3.2, basic bridge concepts such as bridge length, clearance under the girder, river training work, and bridge types were considered by the JET.
- RC continuous slab bridge was selected for Mamti Khola, and the PC simple span girder bridge was adopted for Ghyampe and Bhyakure Khola.
- The JET assisted DOR in the preparation of the detailed design, cost estimate,

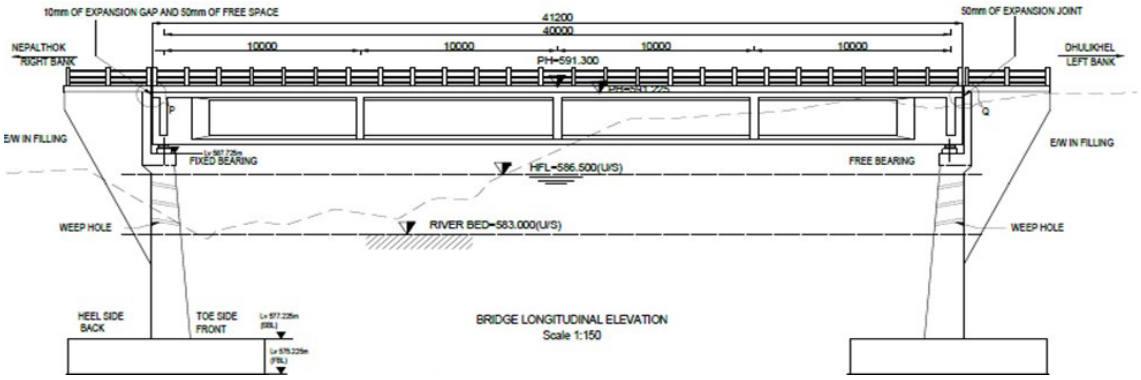
preparation of tender documents, procurement of the contractor(s), and construction supervision of the three projects.

- Bridge design report was submitted in March 2020 and approved by DOR.



Source: JICA Expert Team

Figure 26 General View of Mamti Bridge



Source: JICA Expert Team

Figure 27 Longitudinal Elevation of Bhyakure Bridge and Ghyampe Bridge

Activity 3.4: Implementation of the pilot project in collaboration with DWRI

- The pilot project has originally been planned as causeway rehabilitation by DOR and river training work by DWRI. Because the river training work was considered as a package of the bridge construction work, all the components of the pilot project were conducted by DOR.
- Tender of the pilot project was conducted from June 2021 and the contractor(s) were selected in September 2021.
- Schedule and present status (January 2023) are presented in Table 8.
- The construction period for the pilot project (3 bridges: Mamti, Ghyampe, and Bhyakure), which started in October 2021, is 2 years and is scheduled for completion at the end of September 2023. At present (end of February 2023), the remaining contract period is about 7 months, but except Mamti Bridge, construction of the remaining two bridges is experiencing significant delays. JETt advised DOR to provide guidance and warnings to the contractors. Based on the progress at this point, it is assumed that the remaining two bridges other than the Mamti Bridge will be difficult to complete within the construction period.

Table 8 Schedule and Status of the Pilot Project (January 2023)

Contract Details	Date of Contract Agreement	Contract Duration (months)	Major Work	Progress Status as of Jan. 2023
Construction of Prestressed Concrete (PSC) Post-tensioned 2-webbed Slab Bridge on Ghyampe Khola	29-Sep-21	24	40-m bridge	Foundation excavation
Construction of RC Continuous Slab Bridge over Mamti Khola	28-Sep-21	24	40-m bridge	Pier and abutment in final stage
Construction of Prestressed Concrete (PSC) Post-tensioned 2-webbed Slab Bridge on Bhyakure Khola	28-Sep-21	24	40-m bridge	Detour constructed and foundation excavation started

Source: JICA Expert Team

Activity 3.5: Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project

- JET served as advisors to DOR's pilot project, consulting with DOR during the planning, design, and construction phases of the project and transferring technology as on-the-job training.
- In particular, in the early stages of construction, a joint consultation was held with DOR, JET, and the contractor to clarify their respective roles and authorities, and to discuss and share project construction issues, quality control, and construction management methods using the S-curve, which were then reflected in the subsequent operational management of the project.
- The JET planned and conducted drone surveillance of the progress of the pilot project before the monthly site monitoring with DOR. The results of the drone surveillance were summarized as “Findings and Recommendations” and were subsequently provided to the contractor(s).
- During bridge construction, a detour road across the river channel was necessary to maintain current traffic during construction, however, there was concern that the detour road would be washed out due to the fact that the construction work crossed over the rainy season. For this reason, drone monitoring was conducted to provide guidance on the proper maintenance and management of the detour route.
- The JET analyzed the drone survey video of every month and advised the method of the work with advisory notes.
-

Drone Recording

Discussion with Contractor

Source: JICA Expert Team

Figure 28 Site Visit Report

Table 9 Records of Drone Survey and Advisory Notes Issued

	Drone Monitoring			Findings and Recommen-dations	Monthly Site Monitoring	Technical Advisory	
	Ghyampe	Mamti	Bhyakure			Date	Issue
Oct 2021	(Commencement of work Oct 01)						
Nov 2021					Nov 21	Nov 21	Asking for submission of S-curve
Dec 2021	Dec 19	Dec 14	Dec 15	Dec 28		Dec 01	Submission of S-curve (Ghyampe)
Jan 2022	Jan 16	Jan 15	Jan 14	Jan 24	Jan 06		
Feb 2022	Feb 23	Feb 21	Feb 22	Feb 28	Feb 04	Feb 09	Concreting of Mamti Bridge
Mar 2022	Mar 31	Mar 29	Mar 30	Mar 31	Mar 30	Mar 30	Deck slab construction of Mamti Bridge
Apr 2022	Apr 15	Apr 14	Apr 16	Apr 20	May 03	Apr 25	Excavation sequence of Bhyakure and Ghyampe Bridge
May 2022	May 19	May 18	May 20	May 23	May 31		
Jun 2022	Jun 25	Jun 23	Jun 24	Jun 28	Jun 30		
Jul 2022	Jul 20	Jul 20	Jul 22	Jul 25	N/A		
Aug 2022	Aug 20	Aug 29	Aug 21	Aug 26	N/A		
Sep 2022	Sep 21	Sep 23	Sep 22	Oct 04	N/A		
Oct 2022	N/A	N/A	N/A	N/A	N/A	Oct 12	Design of staging (Training and Workshop)
Nov 2022	Nov 07	Nov 05	Nov 06	Nov 16	N/A		

Source: JICA Expert Team

Activity 3.6: Prepare the manual about the planning, investigation, and design method of the causeway rehabilitation

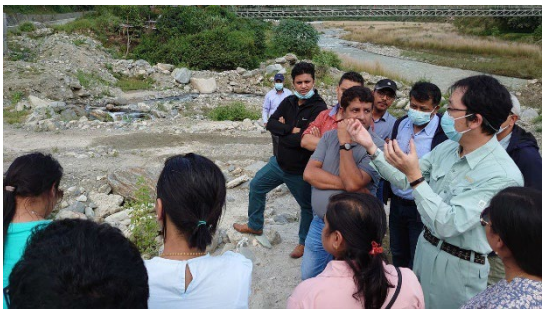
- Although the RC continuous slab bridge used in the Mamti Bridge has not been applied in Nepal in the past, the DOR strongly requested a planning and design manual because this structure type has significant advantages in terms of construction and cost in fan-shaped areas in mountainous regions and is expected to be widely applied in the future.
- At the process of preparing the manual, JET discussed and exchange opinions with DOR. The manual (first edition) was submitted in December 2021, and Final ver. “PLANNING AND DESIGN MANUAL FOR RC CONTINUOUS SLAB BRIGE” which add 3types of general plan was submitted in December 2022.

- Contents of the manual is as follows.

1. INTRODUCTION
2. ADVANTAGE OF THE RC CONTINUOUS SLAB BRIDGE (RCSB)
3. SITE CONDITION SURVEY FOR BRIDGE LOCATION
4. PLANNING OF RCSB
5. STRUCTURAL DESIGN OF RCSB
6. SUPPLEMENTAL INFORMATION

Activity 3.7: Conduct sharing workshops on pilot project

- Based on Activity 3.6, “Training on Design Manual of Reinforced Concrete Slab Bridge (RCSB) and Workshop on Pilot Project” was held on October 12 to 14, 2021 with the participation of 24 engineers from DOR.
- Contents of the workshop are presented in Section II. 1. 1-1. (3) 6).



Site Explanation at Mamti Bridge

Group photo at Workshop

Source: JICA Expert Team

Figure 29 Pilot Project Workshop

Activity 3.8: Conduct a technical study tour in Nepal

- The following tours were conducted in this Project. Details of each tour are provided in Section II. 1. 1-1. (3) 2) & 4) in this report.
  - Technical Training on Asphalt Concrete Mix Design and Quality Control in Pavement Construction
  - Domestic Technical Tour at Nagdhunga Tunnel Construction Project

Asphalt Concrete Mix Design Seminar

Tunnel Construction Site Visit

Source: JICA Expert Team

Figure 30 Photos of Technical Study Tour in Nepal

2. Achievements of the Project

2-1 Outputs and Indicators

The achievement level of each output is presented in Table 10. Five out of eight indicators achieved 100%.

(1) Indicator 2-1 could not reach 100% because EIS required proper and timely maintenance for smooth operation.

(2) Indicator 3-1 could not reach 100% because the construction of the bridge pilot project will be completed after the Project completion.

(3) Indicator 3-2 could not reach 100% because DOR was not actively involved in catching up the pilot project construction schedule.

From the evaluation of the indicators, the achievement level of all three outputs is rated as “high.”

Table 10 Outputs and Achievement Levels

Outputs	Indicators		Achievement Level
	Target Values	Achieved Values	
Output 1			
Capacity to operate and maintain the Sindhuli Road is improved.	1-1. Routine, recurrent and periodic maintenance are conducted properly in accordance with the Annual Road Maintenance Plan (ARMP).	・ Allocated maintenance budget used properly in accordance with ARMP.	100% (High)
	1-2. Specific and emergency maintenance for disaster including emergency response is conducted timely and properly.	・ Roadside protection work and traffic safety work were conducted at 35 locations during the project period. ・ Emergency facilities has mobilized timely and road closure did not continue more than 11 hours.	100% (High)
	1-3. Toll collection system is introduced in the Sindhuli Road in cooperation with DOR and RBN.	・ Toll collection system has been installed. Moreover. A preliminary study has been carried out for introduction of latest ETC system.	100% (High)
Output 2			
Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.	2-1. Emergency Information System (EIS) is operated and managed properly in sustainable manner.	・ It required proper and timely maintenance for smooth operation. The DOR head office intervention is required.	30% (Low)
	2-2. Road safety management is undertaken in accordance with the Road Safety Management Plan.	・ Based on the Road Safety Management Plan prepared in Phase 1, road safety is managed. Revised Road Safety Management Plan was prepared according to the current situation.	100% (High)
	2-3. Awareness and education activities of traffic safety are undertaken by using the developed education materials.	・ Road safety awareness training for schoolteachers were conducted at two locations and education materials were distributed to participants (teachers). ・ Traffic safety workshop was conducted successfully.	100% (High)
Output 3			
Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.	3-1. The Pilot Project for restoration of the damaged causeway is undertaken during the Project period in cooperation with DOR and DWRI.	・ Construction work of Pilot Project for the three bridges started from September 2021. Progress of the Mamti Bridge is around 50% in construction, while the other two bridges did not show remarkable progress except detour work, river protection work, and earth work.	50% (Poor)
	3-2. The Project related issues including causeway disaster countermeasures are presented by individual counterpart at the workshops and the Joint Coordinating Committee (JCC) meetings.	・ At design stage, river treatment for pilot project sites was presented by DWRI at JCC meeting. ・ Detour road management during construction period was presented by DOR engineers at pilot project workshop. Detour road functioned well during rainy season. ・ Construction progress was delayed.	80% (Fair)

Source: DOR, DWRI, RBN, and JICA Expert Team

2-2 Project Purpose and Indicators

(Target values and actual values achieved at completion)

The achievement level of the project purpose is evaluated using certain established indicators.

Project Purpose: The overall operation and maintenance system of the Sindhuli Road is strengthened.

Indicator-1: A road closure caused by disasters does not continue for more than one day unless unexpected situation happens.

Road closure data by section and year since 2019 when the Project was initiated is summarized in Table 11. 13 road closures have confirmed durations and the road closure finished within 11 hours for all cases. On the other hand, there is no road closure duration data for 22 cases.

Table 11 Road Closure Duration (2019-2022)

	Sec. I				Sec. II				Sec. III				Sec. IV				TOTAL
	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022	
Less than 1day	0	1	0	0	0	2	0	1	0	7	0	0	0	1	0	1	**13**
More than 1day	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
No closure time written	0	1	0	0	0	0	0	0	0	0	2	0	0	1	17	1	**22**
TOTAL	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**1**	**0**	**7**	**2**	**0**	**0**	**2**	**17**	**2**	**35**

Source: DOR and the JICA Expert Team

All road closure durations with confirmed data were less than one day. However, more than half of the data do not have confirmed road closure duration. As a consideration for the lack of records of the road closure duration, it could be that the closure duration was so short that no records were made, but the time period and section (construction section 4 in 2021) where no data was available was concentrated. From this, it is highly possible that this is due to information management and sharing by the person in charge of construction Section 4 at that time.

Therefore, the achievement level of this indicator can be said to be 100% if only the data with road closure time is considered, however, since there are many missing data and there is no evidence to conclude that the missing data are short of road closure time, the achievement level of this indicator is set at a fair of about 50%.

Indicator-2: Surface distress index (SDI) on Sindhuli road keeps in less 2 points (in good condition) through a whole year.

The SDI value indicates the degree of pavement surface damage and is the number used by DOR to estimate ARMP for each road. SDI is conducted annually

and rates the pavement surface damage for each arterial roadway in five levels. The 2019-2022 SDI for Sindhuli Road is shown in Table 12, with the exception of FY 2020/2021, where the SDI remains below 2.0, indicating the need for continuous pavement improvement.

Since 75% of the indicators have been achieved, the degree of achievement is considered high.

Note: DOR plans to complete the overlay of the entire Sinzli Road in FY2023, and after the overlay, the SDI value is expected to remain below 2.0 points.

Table 12 Summary of SDI (2019/2020 – 2022/2023)

	2019/2020	2020/2021	2021/2022	2022/2023
Bardibas - Rato River	0.50	1.85	1.92	2.00
Rato River - Chure Temple	0.75	2.00	2.00	2.25
Chure Temple - Sindhuli	1.35	1.86	2.32	2.48
Sindhuli - Khurkot	0.97	2.32	1.61	0.95
Khurkot - Barkhe Khola	0.51	2.13	2.24	2.11
Barkhe Khola - Dhulikhel	2.32	2.85	2.11	2.50
Average of the year	**1.13**	**2.23**	**2.00**	**1.93**

Source: ARMP edited by the JICA Expert Team

Indicator-3: A cooperative framework and the division of the responsibilities between DOR and DWRI at the Ministry level are institutionalized.

In Phase 1, the project was institutionalized through a Minutes agreement between DOR and DWRI at the ministry level. In Phase 2, based on DOR's request, DWRI implemented revetment measures for river erosion along the Gwang River in Section 1, and revetment measures for the Bhalu Bridge substructure along the Sunkoshi River in Section 3. In addition, the Sindhuli Road needs to be realigned for 1 km due to the flooding of a section of the Sindhuli Road caused by the Sunkoshi Marin Diversion Multimurpose project around Kulkot, which DWRI is currently constructing, and DOR and DWRI need to cooperate to implement this project. Based on these circumstances, it can be said that the cooperation and division of responsibilities at the provincial level has been maintained, and the achievement level of Indicator-3 is considered high (100%).

3. History of PDM Modification

(1) One of the “Objectively Verifiable Indicators” of the Project’s overall goal that had not yet been determined is established with mutual confirmation as the

"Traffic accident ratio (number of traffic accident per vehicle-km) in the year 2015 in all sections is reduced by 30% by 2023."

(2) Based on the discussion in the 4th JCC meeting, the duration of the Project has changed from three to four years due to the COVID-19 pandemic.

(3) Based on the amendment of the R/D, which is effective as of February 2021, the Objectively Verifiable Indicators of Output 3 should be amended as follows:

The indicator of original PDM:
"3-1. The pilot project for restoration of the damaged causeway is undertaken and completed in cooperation with DOR and DWRI."
was amended as follows:

"3-1. The pilot project for restoration of the damaged causeway is undertaken during the Project period in cooperation with DOR and DWRI."

4. Others

4-1 Results of Environmental and Social Considerations

According to the approved report for the Brief Environmental Study for bridge construction, the immediate beneficial impact from the pilot project during the construction phase is employment opportunities for the local population. For the implementation of these three bridges, about 21,510 man-days of unskilled and 5,918 man-days of skilled human resources are required.

Most of the identified environmental adverse impacts are locally confined and are limited to the construction period. With the set of proposed mitigation measures, the identified adverse impacts can be minimized and/or compensated. There is no risk of residual impacts on physical, biological, socio-economic, and cultural environment of the project area while implementing the proposal.

An Environmental Management Plan (EMP) has been proposed with the identified issues, possible effects and impacts, measures for their mitigation, and monitoring method and schedule. In addition, the agencies responsible for executing the environmental mitigation measures and monitoring have been

identified as part of the EMP. The tentative costs for the monitoring of EMP is estimated at NRS 450,000.

4-2 Results of Considerations on Gender/Peace Building/Poverty Reduction

Gender consideration was reviewed in the Pre-F/S of the rest area. In the roadside situation of the Sindhuli Road, although restaurants and gas stations have toilets, it is pointed out that there are few quality toilets for women and road users. Considering the current situation, the concept of the rest area in the Sindhuli Road is proposed as follows:

- Step 1: To provide parking and toilets for all road users.
- Step 2: To provide shops and restaurants considering the middle class and all road users.
- The maintenance and management of the facilities will be carried out by DOR, the local government, and private companies.

4-3 Result of Technical Training in Japan

Technical training was conducted to introduce Japanese technologies including toll road system, overlay of pavement, road information management and traffic safety measures, roadside station, future technology of ITS and autonomous driving, long tunnel and bridge technologies, and other technologies through lectures and site visits. An outline of the training is shown in Section II, 1-1, (3).

As a result, each person is highly motivated to participate in the training program, and it can be said that a positive effect can be expected to be implemented top-down based on the knowledge gained from the training.

Lecture of Toll Fee Collection System

Site Visit of Hydraulic Model Experimental Facility

Site Visit of Toll Fee Collection Facility

Group Photo

Source: JICA Expert Team

Figure 31 Technical Training in Japan

Table 13 Schedule of Technical Training in Japan

The Project for Operation and Maintenance of the Sindhuli Road Phase 2

Itinerary of Japan Technical Tour（Tentative）

（2 weeks x Proposed participants : 10 person）

2019/10/2

Date				Program	Place	Location	Accommodation
1	Nov. 3	Sun		Depart from Kathmandu	-		Flying Overnight
2	Nov. 4	Mon		Arrive at Tokyo	-	Tokyo Area	Hotel Villa Fontaine Tokyo - Otemachi
3	Nov. 5	Tue	AM	Courtesy Visit & Orientation of Technical Training	JICA Tokyo		Hotel Villa Fontaine Tokyo - Otemachi
			PM	Toll Road System & Traffic Safety Management (Lecture)	Tokyo Metropolitan Expressway Co. (MEX)		
4	Nov. 6	Wed	AM	Toll Operation System Including toll plaza, Parking Area Facilities, etc. (Lecture)	Tokyo Metropolitan Expressway Co. (MEX)		Hotel Villa Fontaine Tokyo - Otemachi
			PM	Toll Operation System Including Toll Plaza, Parking Area Facilities, etc. (Observation)	MEX's Facilities (Saitama Pre.)		
5	Nov. 7	Thu	AM	Road Disaster Prevention / Disaster Countermeasure Technology（Lecture）	Research and Development Center of Nippon Koei		Hotel Villa Fontaine Tokyo - Otemachi
			PM	Maintenance of Bridge Structure（Lecture）	Nippon Koei Headquarters		
			--	NK Courtesy Call & Welcome Party	Hotel Grand Palace		
6	Nov. 8	Fri	AM	Highway linfrastructure Maintenance Technology（Lecture）	Tokyo Metropolitan Expressway Co., Ltd.(MEX)		Hotel Villa Fontaine Tokyo - Otemachi
			PM	Quality Control and Management of Road Pavement (Lecture)	Nihon Road Co., Ltd.(Central Labor.)		
7	Nov. 9	Sat	AM PM	Holiday			Hotel Villa Fontaine Tokyo - Otemachi
8	Nov. 10	Sun				Nagoya Area (Gifu)	Hotel Route Inn Gifuhashima Ekimae
9	Nov. 11	Mon	AM	Slope Countermeasrue of Moutain Road /Toll Road System（Lecture and Observation）	Japan Automobile Road Corporation (Ibukiyama Driveway)		Hotel Route Inn Gifuhashima Ekimae
			PM	Rest Area(Michino-Eki)（Observation）	Kaidu Municipal Government (Tsukiminosato-Nannou)		
10	Nov. 12	Tue	AM	Travel to Shizuoka		Shizuoka	Grand Hotel Kanachu Hadano
			PM	Contract Management of Maintenance Work of National Road（Lecture and Observation）	Shizuoka National Highway (MLIT)		
11	Nov. 13	Wed	AM	Introduction of a Long Tunnel Technology at Sin-Tomei Expressway (Lecture and Observation)	Central Japan Expressway	Tokyo Area	Hotel Villa Fontaine Tokyo - Otemachi
			PM	Travel to Tokyo			
				Formulation Action Plan	JICA Tokyo		
12	Nov. 14	Thu	AM	Preparation for Action Plan	JICA Tokyo		Hotel Villa Fontaine Tokyo - Otemachi
			PM	Presentation	JICA Tokyo		
13	Nov. 15	Fri	AM PM	Depart from Tokyo (7 Persons)			Flying Overnight (7 Persons) /Hotel Villa Fontaine Tokyo - Otemachi (2 Persons)
14	Nov. 16	Sat		Arrive at Kathmandu(7 Persons) /Depart from Tokyo (2 Persons)			--
15	Nov. 17	Sun		Arrive at Kathmandu (2 Persons)			--

Abbreviation: JICA: Japan International Cooperation Agency
MLIT: Ministry of Land, Infrastructure, Transport and Tourism
MEX: Tokyo Metropolitan Expressway Co. Ltd.
NK: Nippon Koei Co., Ltd.

Source: JICA Expert Team

III. Results of Joint Review

1. Results of Review Based on DAC Evaluation Criteria

This section reviews the implementation results of the Project from the perspectives of six DAC evaluation criteria, which are shown in the table below.

Table 14 Six DAC Evaluation Criteria

Items	Definition
Relevance	・ Validity with project implementation (development needs) ・ Focus on “Beneficiary”. Consideration for inclusiveness and equity ・ Appropriateness of the project plan and logic of approach
Coherence	・ Consistency with the development assistance policies of the Japanese Government and JICA ・ Synergistic effect / mutual relations with JICA’s other projects (technical cooperation, loans, grant aid, etc.) ・ Complementarity, harmonization, and coordination with other assistance / projects in Japan, other development organizations, etc. ・ Consistency with global framework (international targets, initiatives, standards, etc.)
Effectiveness	・ The degree of achievement of the target level in the target year of expected project outcome (different results across the groups)
Efficiency	・ Comparisons of planned and actual project inputs, project period, and project cost
Impact	・ Positive and negative indirect and long-term effects (systems and norms, people’s well-being, human rights, gender equality, and the environment)
Sustainability	・ Outlook on sustainability of effects that are realized by the project in the aspects of polity / political, institutional / organizational, technical, social and environment, risk, and operation and maintenance

Source: Evaluation Department, JICA. JICA’s Project Evaluations. Ver. 2021. 7.

(1) Relevance

“Managing Roads for National Integration and Socio-Economic Development” is the vision for the development of roads in Nepal. The overall goal is to contribute to achieving sustainable socio-economic development by providing safe and affordable public road infrastructure services through the building of a cost-effective, efficient, and reliable road network system.

The outputs of the Project are clearly designed to achieve the above vision and are highly consistent with the upper plan.

(2) Coherence

This Project is highly consistent with the policies of the Japanese government and JICA, as well as international frameworks, as it collaborates with many projects and stakeholders as shown below.

- Studies to verify the applicability of Japanese private company's technology in Nepal were conducted in collaboration with the Project.
  - Traffic Safety Measures Using Luminescence Guidance Technology / JICA (Riken Kogyo in association with Nippon Koei)
  - Environment-Friendly Slope Restoration with Soil Algae / JICA (Joint venture of Nikken Sohonsha and Nippon Koei)
- The Project cooperated with the Slope Protection Works Project implemented in Section II under the Japanese Grant Aid.
- At the traffic safety workshop, knowledge was shared with other donor organizations such as the Asian Development Bank and World Bank, and discussions were held on comprehensive traffic safety initiatives.
- In terms of the international framework perspective, the Project is consistent with "Sustainable Development Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation". In particular, the Project can contribute to the achievement of "Target 9a: Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States".

(3) Effectiveness

Effectiveness is evaluated by whether the project purpose has been achieved as a result of the project implementation. In this regard, evaluation was made based on the achievement level of each output.

- Output 1: Capacity to operate and maintain the Sindhuli Road is improved. (50%)
- Output 2: Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced. (75%)
- Output 3: Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the pilot project. (100%)

As a result of the evaluation above, it can be concluded that the project purpose was achieved by around 75%. According to JICA's evaluation criteria, it means that the project purpose has almost been achieved.

(4) Efficiency

The Japanese portion of the project cost increased from JPY 238.21 million to

JPY 366.91 million due to additional TOR as follows:

- Advisory work of pavement overlay at Section 4
- Change the scope of pilot project from causeway repair to bridge construction
- MM increase due to COVID-19
- Preliminary survey for installation of ETC system

Project period was expanded from 36 months to 48 months. Due to the COVID-19 pandemic, the JICA experts could not travel to Nepal; therefore, some of the project activities have not been implemented in the initial duration of the Project.
These changes to the project cost, inputs, and period were reasonable and necessary for producing outputs. It can be said that the Project was implemented efficiently.

(5) Impact

Planned activities were mostly completed as planned, so it can be evaluated that the overall goal was achieved.

- Technical Transfer by Pilot Project

Bridge constructions for the pilot project related to Output 3, which was to be implemented at the expense of the Nepalese government, could not be completed during the project period. However, technical support according to the construction status was able to be conducted. Therefore, the knowledge will be useful for future construction projects.

- Proposal to introduce ETC to secure road maintenance budget

The JET conducted a preliminary survey on the introduction of ETC as support for improving the accuracy of toll collection. Recommendations from this study are evaluated as having an important and effective impact on RBN in securing funds necessary for future road maintenance. RBN is expected to work collaboratively with DOR and DOTM for future achievement.

- Cooperative Relationship between DOR and DWRI

Cooperative relationship between DOR and DWRI is essential for effective implementation of disaster countermeasures on the Sindhuli Road, which is prone to natural disasters such as floods.
It is hoped that close cooperative relationships between CPs will be maintained in the future in order to achieve the overall goal.

In terms of ripple effects, the bridge type proposed in the pilot project (Reinforced Concrete Slab Bridge / RCSB) is the first structural type of its kind in Nepal and

is effective as a river crossing structure in an alluvial fan. It is expected that this type of structure will be widely adopted throughout the country by utilizing the design manuals and standard drawings created during the Project.

(6) Sustainability

The sustainability of the Project's effects is evaluated from four perspectives: policy and system, institutional and organizational aspect of the implementing agency, technical aspect of the implementing agency, and financial aspect.

- Regarding the policy and system aspect, the Project contents meet the vision for the development of roads in Nepal that is called "Managing Roads for National Integration and Socio-Economic Development. Therefore, CPs are aiming to continue and develop such projects on a continuous basis.
- Regarding the institutional and organizational aspect of the implementing agency, the Project is supposed to maintain the current organization. Currently, the Sindhuli Road Office takes responsibility for the maintenance of the Sindhuli Road, and it has sufficient organization and structure required for the continuation of its work. Normally, once the road construction is completed, the responsibility for managing the road section is transferred from the project office to the Maintenance Branch. However, the Sindhuli Road Office will need to continue road maintenance and management, including road improvement, while receiving foreign assistance including JICA. Therefore, for the time being, it is desirable that the Sindhuli Road Office remains under the jurisdiction of DCID, which is responsible for foreign assistance, rather than being transferred to the Maintenance Branch.
- Regarding the technical aspect of the implementing agency, the technical level of the Sindhuli Road Office is sufficient for the continuation of the Project. However, there is room for improvement in the aspect of overall operation management.
- Regarding the financial aspect, the maintenance budget of RBN and GON is increased every year. Thus, to secure certain maintenance budget, toll road collection system is installed along the Sindhuli Road.

From the examination of these four perspectives, the sustainability of the effects of the Project is considered good.

2. Key Factors Affecting Implementation and Outcomes

The following three items have had a major impact on the operation of this Project:

・ Change in scale of bridge structure for the pilot project

At the request of the DOR, the replacement of the three damaged causeways targeted by the pilot project was changed to a bridge type that significantly increased the construction cost. Due to the shortage of funds for the pilot project, which was originally planned to be implemented with JICA funds, it was decided that the road department would handle the funds, procurement of contractors, and construction management.

・ Shortage of project budget due to COVID-19

The global spread of COVID-19 has had a major impact on the financial situation of the Nepalese government, which has seen a sharp decrease in tourists, and the maintenance and management budget for this Project in 2020/21 has also decreased significantly.

・ Activity stagnation and delays due to the COVID-19 pandemic

Due to the COVID-19 pandemic, lockdowns, travel restrictions, and isolation policies were imposed in stages. In Nepal, due to the issuance of curfews and other restrictions, the CP's scheduled work was hindered, and the activity was suspended or delayed, which has extended the project period. Japanese experts were unable to travel to Nepal for about a year and a half, and during that time, they were forced to work remotely from Japan online. However, the new assignment of Project Coordinator in JET was successful, and it was possible to maintain smooth communication even when the Japanese expert was not present, and there was no serious interruption to the work.

3. Evaluation of the Results of Project Risk Management

・ Response of JICA and GoN to the COVID-19 pandemic

In order to continue the Project activities during the COVID-19 pandemic, JICA has approved the JET to work remotely from Japan. As a result, approximately 28% of the contract 97.1 MMs for this Project was transferred from field MM in Nepal to home MM in Japan. Also, JICA has decided to dispatch the project coordinator to enhance smooth communication between CP and the JET. On the other hand, the GoN has imposed restrictions on going out, including lockdowns, which have disrupted the commuting and normal work of CPs, and many project activities have been suspended or delayed. Along with this situation, it was

decided to extend the contract period for this Project by one year from 36 months to 48 months.

・　Shortage of project budget due to COVID-19

As a countermeasure to the worsening financial situation, the GoN has received emergency loans from the World Bank and others as a countermeasure against the pandemic and has provided support to projects that had been suspended.

・　Responding to changes to the pilot project bridges

It was decided that DOR is supposed to be responsible for the financial burden, procurement of contractors, and construction management for the bridge construction of the pilot project. The JET was in the position of providing technical assistance but did not have the authority to approve or give instructions based on the construction contract. Lack of direct involvement in budget management and progress management is considered to be one of the causes of the significant delay in the construction process.

4. Lessons Learnt

4-1 Lessons learned for responding to the COVID-19 pandemic

During the period when the Japanese experts were unable to travel, the team worked closely with the project coordinator to ensure communication with the CP side. However, it is recognized that there are limitations to online technology transfer. It was necessary to distinguish between work that could be handled remotely and work that needed to be addressed on site. In addition, it is necessary to spend more time for remote work to achieve the same results as that of face-to-face work.

4-2 Response to pilot projects

The delay in the progress of the pilot project is largely due to the COVID-19 pandemic. On the other hand, it cannot be denied that there is a lack of management capacity in the management system of the DOR, which manages construction. The issue is how to improve and maintain the management capacity of the government as privatization progresses.

IV. For the Achievement of Overall Goals after the Project Completion

1. Prospects to Achieve Overall Goal

The achievement of the Project Purpose was evaluated based on 6 criteria (validity, consistency, effectiveness, efficiency, impact, and sustainability) by DAC evaluation in the "III Joint Review". The results of the evaluation are shown below.

Relevance: High
Coherence: High
Effectiveness: Medium
Efficiency: High
Impact: Medium
Sustainability: High

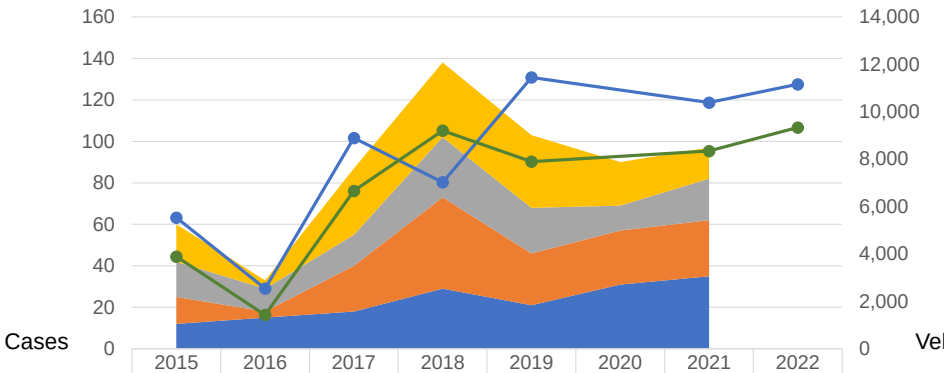
As shown above, the achievement level of the Project Purpose is evaluated as high except for effectiveness and impact.

In addition, the evaluation results for the level of achievement of the Overall Goal are shown below.

- Indicator-1: Traffic accident ratio (number of traffic accident per vehicle-km) in the year 2015 in all sections is reduced by 30% by 2023.

  Annual changes of traffic volume and traffic accident data collected in the Project are shown in Figure 32.

  Traffic volume data are referred from traffic volume survey (2019 and 2022) conducted in the Project. For other years, periodic traffic volume survey conducted by DOR are referred. In our survey, number of survey location is 6 (reference: Figure 17), however in the DOR survey, only 2 survey location (Dhulikhel and Bardibas) is conducted. In 2018, traffic volume survey was conducted under "Preparatory survey for the project for the Sindhuli road earthquake rehabilitation", therefore, traffic volume data of 2018 was referred from the said project. Regarding the traffic accident data, JET could collect raw data from traffic police for the year from 2015 to 2021. Traffic accident data of 2022 is not yet organized and published as of February 2023.



		2015	2016	2017	2018	2019	2020	2021	2022
Traffic Accident	Section IV	18	4	32	36	35	21	15	
	Section III	17	11	15	29	22	12	20	
	Section II	13	3	22	44	25	26	27	
	Section I	12	15	18	29	21	31	35	
Traffic Volume	Dhulikhel	5,533	2,543	8,891	7,024	11,446		10,386	11,157
	Bardibas	3,889	1,428	6,664	9,204	7,894		8,344	9,337

Source: JICA Expert Team

Figure 32 Traffic Volume and Traffic Accident Data (2015-2022)

In evaluating this indicator, it was examined the outliers in the data obtained. At first, number of traffic volume and traffic accident decreased drastically in 2016 due to the trade embargo from India. In 2020, traffic volume expected to decrease sharply due to spread of COVID-19. However, the actual extent of decrease in 2020 is unknown because there is not actual data. In addition, it is considerable to recover the traffic volume in 2021 compared to 2020, but it was not possible to measure the potential influence of the traffic volume. On the other hand, regarding traffic accident data, there is the data of 2020 and 2021. During 2019 to 2021, traffic accident percentage by Section changed but total number of traffic accident was about 90 to 100 cases. From the above data, it is still unclear how the COVID-19 influences traffic tendency of the years. Considering the situation, using data from the last few years to forecast traffic accident ratio for 2023 would be inaccurate.

From the above, evaluation of the indicator shown below is treated as a reference data.

Equation for calculate the traffic accident ratio is shown as follows, and yearly traffic data (case) and traffic volume (veh) are used for the calculation.

$$(TAR(\%)) = \frac{(Number\ of\ Traffic\ Accidents\ (Case))}{(Length\ (km)) \times (Traffic\ Volume\ (Veh))} \times 100$$

Traffic accident ratio since 2015 until 2023 is shown in Table 15 while traffic accident ratio in 2015 is 119%, the latest traffic accident ratio (2021/2022 actual), based on traffic volume data of 2022 and traffic accident data in 2021, 79%. Compared to traffic accident ratio of 2015 (119%), the one of 2022 (2021/2022) decreased to 67%. Traffic volume and traffic accident number of 2023 (target year) was estimated from the regression line of 2015, 2019 and 2021/2022. From the data of 2023, traffic accident ratio of 2023 was calculated to 69%, and compared to 2015 (119%), 59% has decreased.

Table 15 Traffic Accident Ratio (TAR)

Section	①	Number of Traffic Accidents ②				Traffic Volume ③				Traffic Accident Ratio (TAR) ④ (=②/(① x ③))			
	Length (km)	2015 (Actual)	2019 (Actual)	2021 (Actual)	2023 (Estimated)	2015 (Actual)	2019 (Actual)	2022 (Actual)	2023 (Estimated)	2015 (Actual)	2019 (Actual)	2021/2022 (Actual)	2023 (Estimated)
Sec. Ⅳ : Dhulikhel	50	18	36	15	0	5,533	11,445	12,246	13,031	65	63	24	0
Sec. Ⅲ : Nepalthok	37	17	28	20	15	1,489	4,224	4,371	5,211	309	179	124	78
Sec. Ⅱ : Khurkot	36	13	44	27	29	1,058	4,581	4,447	5,547	341	267	169	145
Sec. Ⅰ : Bardibas	37	12	30	35	50	3,682	6,405	7,739	8,344	88	127	122	162
Total	160	60	138	97	94	3,163	7,065	7,628	8,455	119	122	79	69
										Decrease ratio of TAR compared with 2015		**67%**	**59%**

Source JICA Expert Team

From the estimation result, the indicator has been cleared, however as mentioned above, it is difficult to ignore the possibility that the data for the corresponding period may include special factors (the impact of COVID-19). In addition, since the latest data are for 2021 and 2022, it can be said that the estimates are inaccurate.

Therefore, it is necessary to re-evaluate the prospect to achieve the goal with the data of which it could judge there is no influence of COVID-19 after the Project completion.

- <u>Indicator-2: Road users' satisfaction and safety management performance in all sections reach 4.0 points on average.</u>

  Road users' satisfaction and safety management performance which were conducted in 2019 and 2022 are summarized in Table 16. Road users were asked to rate their satisfaction on a 5-point scale (5: excellent to 1: very poor), and the total of the rating points for each rating x the percentage of the rating results was calculated by dividing the total by 100. Road users' satisfaction did not reach 4.0 points in all years and locations.

Table 16 Road Users' Satisfaction and Safety Performance Rate

	Sec. IV: Dhulikhel	Sec. II Khurkot	Sec. I: Bardibas	Average
2019	3.46	3.97	3.87	3.77
2022	3.43	3.42	3.03	3.29

Source: JICA Expert Team

Major comments from road users are summarized as follows:

1. Difficulties during rainfall / road closure at Mamti Causeway (Nepalthok to Dhulikhel);
2. Potholes between Nepalthok and Dhulikhel (Section 4);
3. Timely maintenance of road pavement is needed;
4. Road widening is required (due to increasing traffic volume); and
5. Single-lane bridge should be upgraded to double-lane.

Based on the comments above, timely maintenance of road pavement, bridge construction as double lane, and countermeasure against road closure are required by the road users. This is consistent with the overall direction of the projects promoted by DOR, and this indicator is expected to be achieved to some extent through the implementation of the Mid/Long-term operation and maintenance plan.

- Indicator-3: DOR effectively operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road in cooperation with DWRI and RBN.

  The ARMP is adequately secured from both the RBN and the GON, and is increasing every year (see Table 5). In addition, the road maintenance and management is considered to be at an appropriate level, given that the road closure indicator, which indicates the status of Sindhuli road maintenance and management, has achieved its target value (Indicator-1), and that the traffic accident indicator has also achieved its target value (Indicator-2).

  The following issues can be identified for more effective road maintenance and safety management in the future.

  1) Appropriate analysis and allocation of the budgeted amount for the next fiscal year based on the amount of expenditures for that year

     Information on actual expenditures is not available, and it is unclear whether a proper analysis of the budgeted amount for the next fiscal year has been made.
  2) Centralization of Road Inventory Information

The current road inventory does not centralize information in a form that can be used for routine maintenance activities.

3) Establish a road maintenance management platform
   In order to efficiently perform a wide range of maintenance management, it is desirable to establish a platform that can manage accurate and diverse information.
4) Centralization of EIS systems and designation of organizations responsible for management
   In order to more effectively operate the EIS installed on trunk roads throughout Nepal, it is necessary to centralize the system and designate an organization responsible for its management.

Each CP institution has clearly identified issues that need to be addressed, and joint operational management with each CP will be necessary in the future. Given these circumstances, this indicator is expected to be achieved.

- Indicator-4: DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWRI.
  DWRI has taken countermeasures against natural disasters along the Sindhuli Road such as slope protection work to prevent the collapse of embankment at Bhalu Bridge and some bank protection works at Gwang River in Section 1. The countermeasures were conducted during the Project period in cooperation with DOR.
  It is necessary to continuously take countermeasures against natural disasters in cooperation with DWRI and DOR. Given these circumstances, this indicator is expected to be achieved.

From the above, JET expect DOR to continue to make efforts to achieve the Overall Goal in cooperation with each CP. As a specific measure to achieve this goal, a Mid/Long-Term Maintenance Plan with the year 2023 was jointly developed as the initial year. A summary of the plan is provided below.

2. Plan of Operation and Implementation Structure of the Nepalese Side to Achieve Overall Goal

The proposed Mid/Long-term road maintenance plan is summarized as follows:

- Prerequisite
  - Period of mid-term plan: 2023-2027 (5 years)
  - Period of long-term plan: 2023-2032 (10 years)
  - Current maintenance organization will be maintained until the end of the long-term plan period.
  - Maintenance budget is allocated from RBN sufficiently through the installation of ETC.
  - Countermeasure for disaster outside the ROW is conducted properly in cooperation with DWRI.
  - Fast Track Road will be completed in 2030 by the Nepalese government.
- Components of mid-term plan
  - Construction of three bridges in Section 4 (under construction as pilot project of SROM2)
  - Pavement overlay of the entire Sindhuli Road
  - Partial road widening of town and market areas in Section 4-2, Section 3
  - Introduction of ETC system
  - Handover and integration of EIS to the DOR headquarters
  - Digitization of road management data
  - Strengthening of traffic safety measures (hard/soft)
  - Road relocation due to Sunkoshi Marin Diversion Project (SMDP) for a 1.0-km section near Khurkot
  - Countermeasures for Kaldhunga Stream in Section 4
  - Installation of roadside facility “Michi-no-eki”
- Components of long-term plan
  - Upgrading of Section 1 (Bardibas - Sindhuli Bazar) to double lane standard
  - Upgrading of Section 4-1 (Dhulikhel – 9-km Point) to double lane standard
  - Upgrading of five bridges in Section 4 and 12 causeways in Section 3 to double lane standard
  - Construction of Khurkot - Chiyabari Tunnel

3. Recommendations for the Nepalese Side

For implementing the Mid/Long-term road maintenance plan, recommendations for the Nepalese side are summarized as follows:

1. Jurisdiction of Sindhuli Road Office under DCID
2. Cooperative relationship scheme between DOR/DWRI/RBN
3. Cooperative relationship with JICA

4. Monitoring Plan from the End of the Project to Ex-Post Evaluation

Monitoring to ex-post evaluation after the Project is recommended to be implemented by JICA Nepal Office in consultation with JICA Headquarter, The Monitoring plan is proposed as follows.

Table 17 Monitoring Plan (Proposal)

Indicators	Monitoring Method	Monitoring Items
Goal	Safe and smooth road traffic safety of the Sindhuli Road is maintained	
Monitoring Schedule:	April 2025 (2 years after completion of the Project: SROM2)	
Output 1: Capacity to operate and maintain the Sindhuli Road is improved	**(1) Confirmation of the progress on the mid/long-term road maintenance plan for Sindhuli Road and the status of road maintenance budget allocation from RBN**	・Confirmation of implementation status of mid/long-term road maintenance and sorting out issues
		・Confirmation of RBN maintenance budget allocation to Sindhuli Road
		・Status confirmation of improvement of RBN internal organization
		・Confirmation of institutional issues related to toll collection system by ETC
	Site visits and interviews with responsible agencies	・Issues related to bidding for contractor procurement related to toll fee collection work
		・Confirmation of vehicle license plates uniformity
		・Issues related to the establishment of a national trunk road network with a toll collection system including ETC
	(2) Upgrading of the Sindhuli Road to double lane standards	・Confirmation of the status on upgrading of each section to double lane standard
		・Confirmation of construction plan including design of alignment change section
		・Current status of the increase in traffic volume and traffic accidents situation etc.
	Site visits and interviews with responsible agencies	・Inspection of upgrade section and confirmation of changes
Output 2: Capacity to take measures for road and traffic safety is enhanced on the Sindhuli Road	**Confirmation of the progress of the relocation of the Emergency Information System (EIS)**	・Confirmation of the operation and management status of the five EIS installed in Sindhuli Road
		・Confirmation of the operation and management status of EIS installed in the other trunk roads
		・Confirmation of the organizational structure of the Planning Department in the Road Bureau which is planning to transfer EIS system.
	Site visits and interviews with responsible agencies	・Suggestions and sorting out issues for spread of EIS to national trunk road networks
Output 3: Capacity to restore the damaged causeway on Sindhuli Road is enhanced through the pilot project.	Confirmation of implementation status of pilot projects and results of technology transfer.	・Confirmation of the construction progress of the pilot project
		・Inspections based on technical advisory notes issued during the construction period
		・Confirmation of issues related to the design and construction raised during construction period
	Site visits and interviews with responsible agencies	・Status confirmation of the RC Continuous Slab Bridge (RCSB) manual usage prepared in the pilot project and raising the issues
		・Proposal for RCSB bridge type spread proposed in the pilot project

Source: JICA Expert Team

ANNEX 1: Results of the Project (List of Dispatched Experts, List of Counterparts, List of Trainings, and Revised Plan of Operation)

ANNEX 1: Results of the Project

1. List of Dispatched Experts

Table A-1 List of Dispatched Experts

	Position	*Name*
1	Chief Advisor / Road Administration	Hiroki SHINKAI
2	Deputy Chief Advisor / Road O/M Planner 1	Motoki IWAMARU
3	Road Structural Planner	Hiroshi FUJISAWA
4	Road Structural Planner	Tomokuni HAYAKAWA
5	Traffic Safety Measures / Traffic Safety Education / Project Coordinator	Bindu Shamsher RANA
6	Pavement Quality Control	Izumi MIDORIKAWA
7	Hydrologic Analysis / Flood Control	Khadananda LAMSAL
8	Road Structural Design	Ramesh Prasad KOIRALA
9	Road Disaster Prevention / EIS	Akhilesh Kumar KARNA
10	Toll Road System / Pre-F/S of Rest Area	Kiyoshi NARITA
11	ETC 1	Noboru KONDO
12	ETC 2	Ryohei HAYASHI
13	Coordination / Procurement / Social Environmental Analysis	Keita IRINO
14	Coordination / Procurement	Natsuko SAGAWA
15	Road O/M Planner 2	Hikaru TANAKA

Source: JICA Expert Team

2. List of Counterparts

Table A-2 List of Counterparts

Organization	Position	Name	Period	
			From	To
DOR/DCID	Dupty Director General Project Director	Mr. Arjun Jung Thapa	25th April 2019	21st December 2020
		Mr. Ram Hari Pokharel	30th July 2021	Present
	Sr. Divisional Engineer	Mr. Rupak Raj Bhandari	26th September 2019	2nd JCC only
		Mr. Ashish Thapa Magar	21st December 2020	30th July 2021
		Mr. Prakriti Pokharel	Aug 2022	Present
DOR/ SDDSBRP	Project Manager	Mr. Surya Bahadar Bhat	25th April 2019	21st December 2020
		Mr. Rabindra Lal Das	30th July 2021	Continued from 5th JCC
	Sr. Divisional Engineer	Ms. Radhika Prajapati	25th September 2022	Present
	Engineer	Ms. Shila Shrestha	25th April 2019	26th September 2019
		Ms. Bimala Dhami	25th April 2019	26th September 2019
		Ms. Gitanjali Koirala	21st December 2020	Present
		Mr. Sadhusaran Purbe	-	-
		Mr. Chhabi Paudel	25th April 2019	21st December 2020
		Mr. Trilok Ghimire (DCID)	25th December 2020	5th JCC only

Organization	Position	Name	Period	
			From	To
		Mr. Karna Singh Khatri	2nd March 2022	6th JCC only
		Mr. Ananta Baral	7th Dec 2021	Present
		Mr. Gyanendra Prasad Kalauni	7th Dec 2021	Present
DWRI	Dupty Director General	Mr. Pradeep Thapa	25th April 2019	30th July 2021
		Mr. Sanjeeb Baral	1st August 2022	Present
	Sr. Divisional Engineer	Mr. Basudev Timilsina	25th April 2019	26th September 2019
		Mr. Birendra Yadav	26th September 2019	30th July 2021
	Engineer	Mr. Krishna Bahadur Pandey	25th April 2019	26th September 2019
		Mr. Mukesh Pathak	26th September 2019	30th July 2021
RBN	Exective Director	Mr. Krishna Singh Basnet	25th April 2019	26th September 2019
		Mr. Sushil Babu Dhakal	21st December 2020	-
		Mr. Sagar Gnawali	30th July 2021	-
		Mr. Prem Prakash Khatri	28th Jan 2022	31st July 2022
		Mr. Sagar Gnawali	1st Aug 2022	19th Sep 2022
		Mr. Ganesh Bahadur K C	20th Sep 2022	Present
	Technical Director	Mr. Sagar Gnawali	Commentment	2021 July
	Senior Engineer	Mr. Sanu Babu Prajapati	Commentment	Present

Source: DOR, DWRI and RBN summarized by JICA Expert Team

3. List of Trainings

Table A-3 List of Trainings

No.	Date	Workshop/Seminar	Place	Participants	Organization
1	2nd – 17th November, 2019	Technical Training in Japan	Japan	9	DOR, MOPIT, DWRI, RBN
2	14th February, 2021	Asphalt Concrete Mix Design and Quality Control in Pavement Construction	Nepal	13	DOR
3	3rd & 5th June, 2022	Road Safety Awareness Training for School Teachers	Nepal	50	Schoolteachers
4	1st June, 2022	Domestic Technical Tour at Nagdhunga Tunnel Construction Project	Nepal	10	
5	12th – 14th October, 2022	Training on Planning and Design Material of Reinforced Concrete Continuous Slab Bridge (RCSB) and Workshop on Pilot Project	Nepal	24	
6	16th December, 2022	Traffic Safety Workshop	Nepal	66	

Source: JICA Expert Team

4. Plan of Operation (Latest)

Project Monitoring Sheet II

Version_7　　**Dated September 2, 2022**

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal　　Monitoring

Inputs	Year	1st Year: 2019/2020	2nd Year: 2020/2021	3rd Year: 2021/2022	4th Year: 2022/2023	Remarks	Issue	Solution
		I II III IV	I II III IV	I II III IV	I II III IV			
		4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3			
Expert						■ ■ ■ ■ : Home assingment in Japan		
1. Chief Advisor/Road Administration	Plan							
	Actual							
2. Deputy Chief Advisor/ Road O/M Planner 1	Plan							
	Actual							
3. Road Structure Planner	Plan					Mr. Hayakawa replaced Mr.Fujisawa in Oct. 2021		
	Actual							
4. Traffic Safety Measures/ Traffic Safety Education	Plan							
	Actual							
5. Pavement Quality Control	Plan							
	Actual							
6. Hydrologic Analysis/ Flood Control	Plan							
	Actual							
7. Road Structural Design (Causeway)	Plan						Due to COVID-19 impact,from April 2019 to November 2021, assignment of Japanese Experts was suspended.	MM was shifted after April 2021 or partially consume by home assignment (in Japan)
	Actual							
8. Road Disaster Prevention/ EIS	Plan							
	Actual							
9. Toll Road System/ Pre-F/S of Rest Area	Plan							
	Actual							
10. ETC 1	Plan							
	Actual					ETC 1 and ETC 2 positions were added according to the strong request of ETC installation from ED of RBN.		
11. ETC 2	Plan							
	Actual							
12. Coordination/ Procurement/ Social Environmental Analysis	Plan							
	Actual							
13. Road O/M Planner 2	Plan							
	Actual							
Total	Plan							
	Actual							
Equipment								
To be determined	Plan						To be determined	
	Actual							
Training in Japan								
November 3 – November 16, 2019. (14 days)	Plan							
	Actual					Completed successfully		
Training Tour								
Technical Training on Asphalt Concrete Mix Design and Quality Control in Pavement Construction / Domestic Technical Tour at NTCP	Plan							
	Actual					Pavement seminar and technical tour at NTCP were finished successfully.		

Activities / Sub-Activities		Year	1st Year	2nd Year	3rd Year	3rd Year	Responsible Organization: Japan	Responsible Organization: Nepal	Achievements	Issue & Countermeasures
			I II III IV	I II III IV	I II III IV	I II III IV				
Output 1: Capacity to operate and maintain the Sindhuli Road is improved.										
1.1 Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN		Plan					JICA Expert	SRMU	Work Plan was confirmed	
		Actual								
1.2 Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2	✓ ✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU	Annual allocated budget for 2020/2021 was confirmed	Budget consuption progress is to be discussed
		Actual								
1.3 Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project	✓ ✓ ✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU, SRDMU, RBN		
		Actual								
1.4 Update the hazard map and road inventories of the Sindhuli Road	✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU		
		Actual								
1.5 Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP	✓ ✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU	Various maintenance works are On-Going.	
		Actual								
1.6 Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening	✓ ✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU	Overlay work of Sec. IV is now processing. Basic plan of partial widening is established. Heavy overlay damage has confirmed between Dhulikhel - Patalekhet where overlay work was done 2 years ago.	Reconstruction of Dhulikhel - Patalekhet overlay work was proposed. Quality control and implementation plan is to be discussed,
		Actual								
1.7 Conduct countermeasure works against water induced disasters beyond Right of Way by DWRI	✓ ✓ ✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRDMU	Target site selection is in progress	To be discussed with DWRI
		Actual								
1.8 Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN	✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU, RBN	Toll system was introduced while contractor procurement is remained	Introduction plan of HETC is to be discussed among related parties.
		Actual								
1.9 Convene regular meetings and monitoring for road operation and maintenance	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU, SRDMU, RBN	Held monthly meeting and joint site patrol	Utilize online communication
		Actual								
Output 2: Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.										
2.1 Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents	✓ ✓	Plan					JICA Expert	SRMU	Collected the accident record from 2011 to 2021	Checking accuracy and analyzing data
		Actual								
2.2 Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan	✓ ✓ ✓	Plan					JICA Expert	SRMU	Overall improvement planning are in progress. Concrete block installation and painting works are On-Going	Safety instrument installation should be proceeded based on its prioritization.
		Actual								
2.3 Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users	✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU	Additional RIB was installed at Khurkot	Comprehensive handover plan should be discussed among DOR
		Actual								
2.4 Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local administration	✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU		
		Actual								
2.5 Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.)	✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU	Traffic Survey was conducted in June 2019. 2nd Traffic Survey was conducted in May 2022	None
		Actual								
2.6 Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities	✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU	Road Safety Awareness Training for School Teachers was conducted in June 2022. Education equipments and materials were distributed to participated school teachers.	Workshop will be planned in late 2022.
		Actual								
2.7 Conduct a sharing workshop on road traffic safety	✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU		
		Actual								
2.8 Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road	✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU	Concept and candidate site was established	
		Actual								

Output 3: Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.

Activity												Plan/Actual	Responsible	Implementing	Achievements / Remarks	Solution
3.1 Conduct the site survey of the Sindhuli road and select the sites for pilot project	✓	✓	✓			✓						Plan / Actual	JICA Expert	SRMU, SRDMU	Target site was confirmed	
3.2 Conduct the natural condition surveys including EIA, topo. and geological investigations		✓	✓			✓				✓	✓	Plan / Actual	JICA Expert	SRMU, SRDMU	Topographic and geological surveys were conducted	
3.3 Prepare the design, cost estimation and tender documents for the pilot project including tender assistant	✓	✓	✓			✓	✓					Plan / Actual	JICA Expert	SRMU, SRDMU	Contractors were procured.	
3.4 Implementation of the pilot project in cooperation with DWRI	✓		✓	✓								Plan / Actual	JICA Expert	SRMU, SRDMU	Construction of 3 pilot projects has started since end of September 2021. Japanese experts are difficult to monitor progress of pilot project due to COVID-19 restriction. Confimed that DWRI will conduct river training.	Monthly drone video shooting of the site is using as remote monitoring system for progress report.
3.5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project			✓	✓		✓	✓					Plan / Actual	JICA Expert	SRMU, SRDMU	Regular monitoring system was established	
3.6 Prepare the manual about the planning, investigation and design method of the causeway rehabilitation	✓		✓			✓	✓					Plan / Actual	JICA Expert	SRMU, SRDMU	Manual was completed and submitted on June 2022.	
3.7 Conduct a sharing workshops on pilot project	✓	✓	✓	✓		✓	✓					Plan / Actual	JICA Expert	SRMU, SRDMU	to be held soon	to be discussed between DOR and JET
3.8 Conduct a technical study tour in Nepal	✓	✓	✓	✓			✓					Plan / Actual	JICA Expert	SRMU, SRDMU	Asphalt concrete mix design-seminar was held February 2021 and finished successfully. Domestic Technical Tour at Nagdhunga Tunnel Construction Project was held June 2022 and finished successfully.	

Duration / Phasing		
Plan	Phase 2-1 (18 months)	Phase 2-2 (18 months)
Actual		

Monitoring Plan	Year	1st Year: 2019/2020				2nd Year: 2020/2021				3rd Year: 2021/2022				4th Year: 2022/2023				Remarks	Issue	Solution
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV			
Monitoring																				
Joint Coordinating Committee (JCC) Meeting	Plan	✓	✓		✓			✓		✓		✓		✓			✓	The 7th JCC was held in August 2022.	Project is proceeding by remote communication.	JCC is held by using online video meeting.
	Actual	✓	✓		✓			✓			✓		✓		✓					
Set-up the Detailed Plan of Operation	Plan	✓																		
	Actual	✓																		
Submission of Monitoring Sheet	Plan	✓	✓		✓				✓		✓		✓		✓		✓		To be confirmed by remote communication	MS ver.7 will be submitted in August 2022
	Actual	✓	✓			✓			✓		✓		✓		✓					
Monthly Meeting	Plan	✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓		Held only month that mojor experts are staying	
	Actual	✓ ✓	✓ ✓ ✓	✓	✓ ✓							✓ ✓		✓	✓					
Monitoring Mission from Japan	Plan																			
	Actual																			
Joint Monitoring	Plan																			
	Actual																			
Post Monitoring	Plan																			
	Actual																			
Reports/Documents																				
Work Plan of Phase 2	Plan	✓																	None	
	Actual	✓																		
Project Completion Report	Plan																✓			
	Actual																			
Public Relations																				
Details to be determined	Plan																			
	Actual																			
	Plan																			
	Actual																			

SRMU: Sindhuli Road Maintenance Unit (under DOR) SRMU: Sindhuli Road Maintenance Unit (under DOR)

SRDMU: Sindhuli Road Disaster Management Unit (under SRDMU: Sindhuli Road Disaster Management Unit (under DWRI)

ANNEX 2: List of Products (Report, Manuals, Handbooks, etc.) Provided by the Project

Output 1-1. Technical Report on Examination on the Introduction of Toll Road System in Sindhuli Road (June 2019)
Output 1-2. Technical Report on Major Improvement Items Required for Overlay Pavement (July 2019)
Output 1-3. Preliminary Survey for Introduction of ETC on Sindhuli Road (January 2023)
Output 1-4. Mid/Long term operation and maintenance plan (February 2023)
Output 2-1. Traffic Survey Report 2019 (August 2019)
Output 2-2. Technical Report on Pre-F/S on Rest Area in Sindhuli Road (September 2019)
Output 2-3. Preliminary Survey Report for The Road Improvement Plan (March 2020)
Output 2-4. Assessment of the EIS Status, Issues and Recommended Measures for Restoration (November 2021)
Output 2-5. Implementation Report on “Road Safety Awareness Training for School Teachers” (July 2022)
Output 2-6. Traffic Survey Report 2022 (August 2022)
Output 2-7. Traffic Safety Improvement Plan for Bardibas – Sindhuli – Dhulikhel Road (BP Highway) (August 2022)
Output 2-8. Implementation Report on “Road Safety Workshop” (January 2023)
Output 3-1. Topographic Survey & Mapping Report (July 2019)
Output 3-2. Geological and Geotechnical Report for Bhyakure Khola and Ghyampe Khola (February 2020)
Output 3-3. Implementation Report on The Technical Training on “Asphalt Concrete Mix Design and Quality Control in Pavement Construction” (March 2021)
Output 3-4. Report on Domestic Technical Tour at Nagdhunga Tunnel Construction Project (June 2022)
Output 3-5. Design Report for The Pilot Project (October 2020)
Output 3-6. Planning and Design Manual for RC Continuous Slab Bridge (RCSB) (December 2022)
Output 3-7. Environmental Impact Assessment of Pilot Project (May 2022)
Output 3-8. The Training on Design Manual of Reinforced Concrete Slab Bridge (RCSB) and The Workshop on Pilot Project

ANNEX 3: PDM
(All versions of PDM)

PDM 1

Project Design Matrix (PDM)

Annex 2

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal

Version_0

Implementing Agency: Department of Roads (DOR), Department of Water Induced Disaster Management (DWIDM) and Roads Board Nepal (RBN)

Dated Feb 2, 2017

Target Group: Staff members of DOR, DWIDM and RBN

Period of Project: Apr 2018 - Mar 2021 (36 months)

Project Site: Sindhuli Road

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
The safe and smooth road traffic along the Sindhuli Road is maintained.	1. Fatality ratio per vehicle-km for the year of 2011 in all sections reduces by X% by 2023. 2. Road users' satisfaction to road maintenance and safety management and performance in all sections reaches 4.0 points in average. 3. DOR operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road effectively in cooperation with DWIDM and RBN. 4. DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWIDM.	1. Traffic accident report by the Sindhuli Road Maintenance Unit (SRMU)/Traffic data by the SRMU 2. Interview result of road users based on the traffic survey by the SRMU 3-1. An execution rate of road maintenance budget allocated by RBN and DOR for Sindhuli Road 3-2. Road inventory, disaster and maintenance records 3-3. Operation and maintenance records of EIS 3-4. Records of road safety countermeasures in the Road Safety Management Plan 4. Records of road disasters and road maintenance	The policy and direction on the road operation and maintenance are not drastically changed by the Government of Nepal (GON).		
Project Purpose					
The overall operation and maintenance system of the Sindhuli Road is strengthened.	1. A road closure caused by disasters does not continue for more than one day unless unexpected situation happens. 2. Surface distress index (SDI) on Sindhuli road keeps in less 2 point (in good condition) through a whole year. 3. A cooperative framework and the division of the responsibilities between DOR and DWIDM at the Ministry level are institutionalized.	1. Road maintenance record and hazard record 2. SDI record, Disaster record, Road maintenance record, Annual Work Plan 3. Agreement between DOR and DWIDM at the Ministry level	1. Road safety awareness campaign is conducted by various agencies such as Department of Transport Management, Traffic Police, media and other related agencies. 2. The budget and personnel necessary for the road operation and maintenance are to be allocated continuously.		
Outputs					
1. Capacity to operate and maintain the Sindhuli Road is improved.	1-1. Routine, recurrent and periodic maintenance are conducted properly in accordance with the Annual Road Maintenance Plan (ARMP). 1-2. Specific and emergency maintenance for disaster including emergency response is conducted timely and properly. 1-3. Toll collection system is introduced in the Sindhuli Road in cooperation with DOR and RBN.	1-1-1. Maintenance budget allocated from RBN and DOR 1-1-2. An execution rate of the maintenance budget 1-1-3. Record of road maintenance work 1-2. Operation record of maintenance machineries including emergency equipment supplied by JICA 1-3. Toll collection system plan in the Sindhuli Road			
2. Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.	2-1. Emergency Information System (EIS) is operated and managed properly in sustainable manner. 2-2. Road safety management is undertaken in accordance with the Road Safety Management Plan. 2-3. Awareness and education activities of traffic safety are undertaken by using the developed education materials.	2-1. Operation and maintenance record of EIS 2-2. Road Safety Management Plan 2-3. Education materials of road safety and record of awareness and education activities			
3. Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Projects.	3-1. The Pilot Projects for restoration of the damaged causeways are undertaken and completed in cooperation with DOR and DWIDM. 3-2. The Project related issues including causeway disaster countermeasures are presented by individual counterpart at the workshops and the Joint Coordinating Committee (JCC) meetings.	3-1. Implementation schedule of the pilot project 3-2. Results of seminars and workshops, a manual and training reports			

Activities	Inputs		Important Assumption
	The Japanese Side	The Nepalese Side	
1-1. Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWIDM and RBN 1-2. Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2 1-3. Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project 1-4. Update the hazard map and road inventories of the Sindhuli Road 1-5. Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP 1-6. Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening 1-7. Conduct countermeasure works against water induced disasters beyond the right of way by DWIDM 1-8. Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN 1-9. Convene regular meetings and monitoring for road operation and maintenance 2-1. Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents 2-2. Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan 2-3. Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users 2-4. Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local authorities 2-5. Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.) 2-6. Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities 2-7. Conduct a sharing workshop on road traffic safety 2-8. Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road 3-1. Conduct the site survey of the Sindhuli road and select the sites for pilot projects 3-2. Conduct the natural condition surveys including EIA, topo. and geological investigations 3-3. Prepare the design, cost estimation and tender documents for the pilot projects 3-4. Implementation of the pilot projects in collaboration with DWIDM 3-5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project 3-6. Prepare the manual about the planning, investigation and design method of the causeway rehabilitation 3-7. Conduct a sharing workshops on pilot projects 3-8. Conduct a technical study tour in Nepal	1. Japanese experts - Chief advisor/Road administration - Road structure plan (pilot project) - Road maintenance management - Traffic safety/Traffic survey - Hydrologic analysis/River training - Structure design - EIS - Traffic safety education - Toll collection system - Coordination/ Procurement of equipment and contractor/ Environment analysis 2. Pilot projects for restoration of causeway disaster 3. Training in Japan or/and the third countries 4. In country training (technical study tour) 5. Provision of equipment - Total Station - Levelling machine - GI wire tensile strength testing machine - Automagtic rainfall guage - GPS with functon of Geological compass - Mobile hct mix plant - Bitumen boiler - Hand roller - Portable compressor - rock dril - Jack hammer 6. Local expenses for the Project activities	1. Counterpart Personnel (C/P) 【DOR】 - Project Director - Project Manager - Engineer - Sub-Engineer 【DWIDM】 - Senior Divisional Hydrogeologist - River Disaster Expert (Civil Engineer) 【RBN】 - Senior Engineer 2. Expenses for the related Project activities and others specified in Basic Principles for Technical Cooperation 【DOR】 -Expense for operation and maintenance, and other safety measures of the Sindhuli Road 【DWIDM】 -Expense for water induced disaster management works beyond the right of way 【RBN】 -Expense for introduction of the toll collection system 3. Provision of 4-WD vehicle for the site visit 4. Others	**Pre-Conditions** Most of the counterparts who were trained by the Phase 1 keep being deployed as counterparts of the Phase 2. **<Issues and countermeasures>**

PDM 2

Project Monioring Sheet I

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal
Implementing Agency: Department of Roads (DOR), Department of Water Resources and Irrigation (DWRI) and Roads Board Nepal (RBN)
Target Group: Staff members of DOR, DWRI and RBN
Period of Project: Apr 2018 - Mar 2021 (36 months)
Project Site: Sindhuli Road

Version_1
Dated Apr.25.2019

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal The safe and smooth road traffic along the Sindhuli Road is maintained.	1. Fatality ratio per vehicle-km for the year of 2011 in all sections reduces by X% by 2023. 2. Road users' satisfaction to road maintenance and safety management and performance in all sections reaches 4.0 points in average. 3. DOR operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road effectively in cooperation with DWRI and RBN. 4. DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWRI.	1. Traffic accident report by the Sindhuli Road Maintenance Unit (SRMU)/Traffic data by the SRMU 2. Interview result of road users based on the traffic survey by the SRMU 3-1. An execution rate of road maintenance budget allocated by RBN and DOR for Sindhuli Road 3-2. Road inventory, disaster and maintenance records 3-3. Operation and maintenance records of EIS 3-4. Records of road safety countermeasures in the Road Safety Management Plan 4. Records of road disasters and road maintenance	The policy and direction on the road operation and maintenance are not drastically changed by the Government of Nepal (GON).		
Project Purpose The overall operation and maintenance system of the Sindhuli Road is strengthened.	1. A road closure caused by disasters does not continue for more than one day unless unexpected situation happens. 2. Surface distress index (SDI) on Sindhuli road keeps in less 2 point (in good condition) through a whole year. 3. A cooperative framework and the division of the responsibilities between DOR and DWRI at the Ministry level are institutionalized.	1. Road maintenance record and hazard record 2. SDI record, Disaster record, Road maintenance record, Annual Work Plan 3. Agreement between DOR and DWRI at the Ministry level	1. Road safety awareness campaign is conducted by various agencies such as Department of Transport Management, Traffic Police, media and other related agencies. 2. The budget and personnel necessary for the road operation and maintenance are to be allocated continuously.		
Outputs 1. Capacity to operate and maintain the Sindhuli Road is improved.	1-1. Routine, recurrent and periodic maintenance are conducted properly in accordance with the Annual Road Maintenance Plan (ARMP). 1-2. Specific and emergency maintenance for disaster including emergency response is conducted timely and properly. 1-3. Toll collection system is introduced in the Sindhuli Road in cooperation with DOR and RBN.	1-1-1. Maintenance budget allocated from RBN and DOR 1-1-2. An execution rate of the maintenance budget 1-1-3. Record of road maintenance work 1-2. Operation record of maintenance machineries including emergency equipment supplied by JICA 1-3. Toll collection system plan in the Sindhuli Road			
2. Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.	2-1. Emergency Information System (EIS) is operated and managed properly in sustainable manner. 2-2. Road safety management is undertaken in accordance with the Road Safety Management Plan. 2-3. Awareness and education activities of traffic safety are undertaken by using the developed education materials.	2-1. Operation and maintenance record of EIS 2-2. Road Safety Management Plan 2-3. Education materials of road safety and record of awareness and education activities			
3. Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.	3-1. The Pilot Project for restoration of the damaged causeway is undertaken and completed in cooperation with DOR and DWRI. 3-2. The Project related issues including causeway disaster countermeasures are presented by individual counterpart at the workshops and the Joint Coordinating Committee (JCC) meetings.	3-1. Implementation schedule of the pilot project 3-2. Results of seminars and workshops, a manual and training reports			

Activities	Inputs		Important Assumption
	The Japanese Side	The Nepalese Side	
1-1. Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN 1-2. Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2 1-3. Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project 1-4. Update the hazard map and road inventories of the Sindhuli Road 1-5. Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP 1-6. Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening 1-7. Conduct countermeasure works against water induced disasters beyond the right of way by DWRI 1-8. Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN 1-9. Convene regular meetings and monitoring for road operation and maintenance	1. Japanese experts - Chief advisor/Road administration - Deputy Chief Advisor/RoadO/M Planner - Road Structure Planner - Traffic safety Measure/Traffic Safety Education - Pavement Quality Control - Hydrologic Analysis/Flood Control - Road Structural Design - Road Disaster Prevention/EIS - Toll Road System/Pre-F/S of Rest Rrea - Coordination/Procurement/Social Evirmental Analysis 2. Pilot project for restoration of causeway disaster 3. Training in Japan or/and the third countries 4. In country training (technical study tour) 5. Local expenses for the Project activities	1. Counterpart Personnel (C/P) 【DOR】 - Project Director - Project Manager - Engineer - Sub-Engineer 【DWRI】 - Senior Divisional Hydrogeologist - River Disaster Expert (Civil Engineer) 【RBN】 - Senior Engineer 2. Expenses for the related Project activities and others specified in Basic Principles for Technical Cooperation 【DOR】 -Expense for operation and maintenance, and other safety measures of the Sindhuli Road 【DWRI】 -Expense for water induced disaster management works beyond the right of way 【RBN】 -Expense for introduction of the toll collection system 3. Provision of 4-WD vehicle for the site visit 4. Others	
2-1. Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents 2-2. Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan 2-3. Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users 2-4. Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local authorities 2-5. Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.) 2-6. Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities 2-7. Conduct a sharing workshop on road traffic safety 2-8. Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road			**Pre-Conditions** Most of the counterparts who were trained by the Phase 1 keep being deployed as counterparts of the Phase 2.
3-1. Conduct the site survey of the Sindhuli road and select the sites for pilot project 3-2. Conduct the natural condition surveys including EIA, topo. and geological investigations 3-3. Prepare the design, cost estimation and tender documents for the pilot project 3-4. Implementation of the pilot project in collaboration with DWRI 3-5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project 3-6. Prepare the manual about the planning, investigation and design method of the causeway rehabilitation 3-7. Conduct a sharing workshops on pilot project 3-8. Conduct a technical study tour in Nepal			**<Issues and countermeasures>**

PDM 3

Project Monioring Sheet I

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal
Implementing Agency: Department of Roads (DOR), Department of Water Resources and Irrigation (DWRI) and Roads Board Nepal (RBN)
Target Group: Staff members of DOR, DWRI and RBN
Period of Project: Apr 2018 - Mar 2021 (36 months)
Project Site: Sindhuli Road

Version_2
Dated Oct.9. 2019

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
The safe and smooth road traffic along the Sindhuli Road is maintained.	1. Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023. 2. Road users' satisfaction to road maintenance and safety management and performance in all sections reaches 4.0 points in average. 3. DOR operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road effectively in cooperation with DWRI and RBN. 4. DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWRI.	1. Traffic accident report by the Sindhuli Road Maintenance Unit (SRMU)/Traffic data by the SRMU 2. Interview result of road users based on the traffic survey by the SRMU 3-1. An execution rate of road maintenance budget allocated by RBN and DOR for Sindhuli Road 3-2. Road inventory, disaster and maintenance records 3-3. Operation and maintenance records of EIS 3-4. Records of road safety countermeasures in the Road Safety Management Plan 4. Records of road disasters and road maintenance	The policy and direction on the road operation and maintenance are not drastically changed by the Government of Nepal (GON).	Set a target indicator that was not yet determined	
Project Purpose					
The overall operation and maintenance system of the Sindhuli Road is strengthened.	1. A road closure caused by disasters does not continue for more than one day unless unexpected situation happens. 2. Surface distress index (SDI) on Sindhuli road keeps in less 2 point (in good condition) through a whole year. 3. A cooperative framework and the division of the responsibilities between DOR and DWRI at the Ministry level are institutionalized.	1. Road maintenance record and hazard record 2. SDI record, Disaster record, Road maintenance record, Annual Work Plan 3. Agreement between DOR and DWRI at the Ministry level	1. Road safety awareness campaign is conducted by various agencies such as Department of Transport Management, Traffic Police, media and other related agencies. 2. The budget and personnel necessary for the road operation and maintenance are to be allocated continuously.		
Outputs					
1. Capacity to operate and maintain the Sindhuli Road is improved.	1-1. Routine, recurrent and periodic maintenance are conducted properly in accordance with the Annual Road Maintenance Plan (ARMP). 1-2. Specific and emergency maintenance for disaster including emergency response is conducted timely and properly. 1-3. Toll collection system is introduced in the Sindhuli Road in cooperation with DOR and RBN.	1-1-1. Maintenance budget allocated from RBN and DOR 1-1-2. An execution rate of the maintenance budget 1-1-3. Record of road maintenance work 1-2. Operation record of maintenance machineries including emergency equipment supplied by JICA 1-3. Toll collection system plan in the Sindhuli Road			
2. Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.	2-1. Emergency Information System (EIS) is operated and managed properly in sustainable manner. 2-2. Road safety management is undertaken in accordance with the Road Safety Management Plan. 2-3. Awareness and education activities of traffic safety are undertaken by using the developed education materials.	2-1. Operation and maintenance record of EIS 2-2. Road Safety Management Plan 2-3. Education materials of road safety and record of awareness and education activities			
3. Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.	3-1. The Pilot Project for restoration of the damaged causeway is undertaken and completed in cooperation with DOR and DWRI. 3-2. The Project related issues including causeway disaster countermeasures are presented by individual counterpart at the workshops and the Joint Coordinating Committee (JCC) meetings.	3-1. Implementation schedule of the pilot project 3-2. Results of seminars and workshops, a manual and training reports			

Activities	Inputs		Important Assumption
	The Japanese Side	**The Nepalese Side**	
1-1. Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN 1-2. Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2 1-3. Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project 1-4. Update the hazard map and road inventories of the Sindhuli Road 1-5. Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP 1-6. Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening 1-7. Conduct countermeasure works against water induced disasters beyond the right of way by DWRI 1-8. Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN 1-9. Convene regular meetings and monitoring for road operation and maintenance	1. Japanese experts - Chief advisor/Road administration - Deputy Chief Advisor/RoadO/M Planner - Road Structure Planner - Traffic safety Measure/Traffic Safety Education - Pavement Quality Control - Hydrologic Analysis/Flood Control - Road Structural Design - Road Disaster Prevention/EIS - Toll Road System/Pre-F/S of Rest Rrea - Coordination/Procurement/Social Evirmental Analysis 2. Pilot project for restoration of causeway disaster 3. Training in Japan or/and the third countries 4. In country training (technical study tour) 5. Local expenses for the Project activities	1. Counterpart Personnel (C/P) 【DOR】 - Project Director - Project Manager - Engineer - Sub-Engineer 【DWRI】 - Senior Divisional Hydrogeologist - River Disaster Expert (Civil Engineer) 【RBN】 - Senior Engineer 2. Expenses for the related Project activities and others specified in Basic Principles for Technical Cooperation 【DOR】 -Expense for operation and maintenance, and other safety measures of the Sindhuli Road 【DWRI】 -Expense for water induced disaster management works beyond the right of way 【RBN】 -Expense for introduction of the toll collection system 3. Provision of 4-WD vehicle for the site visit 4. Others	
2-1. Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents 2-2. Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan 2-3. Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users 2-4. Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local authorities 2-5. Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.) 2-6. Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities 2-7. Conduct a sharing workshop on road traffic safety 2-8. Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road			**Pre-Conditions** Most of the counterparts who were trained by the Phase 1 keep being deployed as counterparts of the Phase 2.
3-1. Conduct the site survey of the Sindhuli road and select the sites for pilot project 3-2. Conduct the natural condition surveys including EIA, topo. and geological investigations 3-3. Prepare the design, cost estimation and tender documents for the pilot project 3-4. Implementation of the pilot project in collaboration with DWRI 3-5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project 3-6. Prepare the manual about the planning, investigation and design method of the causeway rehabilitation 3-7. Conduct a sharing workshops on pilot project 3-8. Conduct a technical study tour in Nepal			**<Issues and countermeasures>**

PDM 4

Project Monioring Sheet I

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal

Implementing Agency: Department of Roads (DOR), Department of Water Resources and Irrigation (DWRI) and Roads Board Nepal (RBN)

Target Group: Staff members of DOR, DWRI and RBN

Period of Project: Apr 2019 - Mar 2023 (48 months)

Project Site: Sindhuli Road

Version_7

Dated September 2. 2022

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
The safe and smooth road traffic along the Sindhuli Road is maintained.	1. Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023.	1. Traffic accident report by the Sindhuli Road Maintenance Unit (SRMU)/Traffic data by the SRMU	The policy and direction on the road operation and maintenance are not drastically changed by the Government of Nepal (GON).	Set a target indicator that was not yet determined (Ver.2)	COVID-19 pandemic after March 2020 influenced traffic volume, construction procurement and work performance. The above matter caused large impact on the verification of Overall Goal.
	2. Road users' satisfaction to road maintenance and safety management and performance in all sections reaches 4.0 points in average.	2. Interview result of road users based on the traffic survey by the SRMU		Road users' satisfaction was surveyed in 2019 and 2022 and the value was 3.53 on average.	
	3. DOR operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road effectively in cooperation with DWRI and RBN.	3-1. An execution rate of road maintenance budget allocated by RBN and DOR for Sindhuli Road		Financial progress of FY2019/2020, 2020/2021 & 2021/2022 was reported.	
		3-2. Road inventory, disaster and maintenance records		-	
		3-3. Operation and maintenance records of EIS		-	
		3-4. Records of road safety countermeasures in the Road Safety Management Plan		Existing Road Safety Management Plan was reviewed and updated.	
	4. DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWRI.	4. Records of road disasters and road maintenance		-	
Project Purpose					
The overall operation and maintenance system of the Sindhuli Road is strengthened.	1. A road closure caused by disasters does not continue for more than one day unless unexpected situation happens.	1. Road maintenance record and hazard record	1. Road safety awareness campaign is conducted by various agencies such as Department of Transport Management, Traffic Police, media and other related	-	
	2. Surface distress index (SDI) on Sindhuli road keeps in less 2 point (in good condition) through a whole year.	2. SDI record, Disaster record, Road maintenance record, Annual Work Plan			
	3. A cooperative framework and the division of the responsibilities between DOR and DWRI at the Ministry level are institutionalized.	3. Agreement between DOR and DWRI at the Ministry level	2. The budget and personnel necessary for the road operation and maintenance are to be allocated continuously.		
Outputs					
1. Capacity to operate and maintain the Sindhuli Road is improved.	1-1. Routine, recurrent and periodic maintenance are conducted properly in accordance with the Annual Road Maintenance Plan (ARMP).	1-1-1. Maintenance budget allocated from RBN and DOR 1-1-2. An execution rate of the maintenance budget 1-1-3. Record of road maintenance		Maintenance budget and exexution rate were reported on JCC meeting.	
	1-2. Specific and emergency maintenance for disaster including emergency response is conducted timely and properly.	1-2. Operation record of maintenance machineries including emergency equipment supplied by JICA			
	1-3. Toll collection system is introduced in the Sindhuli Road in cooperation with DOR and RBN.	1-3. Toll collection system plan in the Sindhuli Road		Toll collection was started from Sep. 2019. Preliminary survey for installation of ETC has been started from May 2022.	
2. Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.	2-1. Emergency Information System (EIS) is operated and managed properly in sustainable manner.	2-1. Operation and maintenance record of EIS			
	2-2. Road safety management is undertaken in accordance with the Road Safety Management Plan.	2-2. Road Safety Management Plan		Road safety management is undertaken in accordance with the Road Safety Management Plan. The plan was updated as "Road Safety Improvement Plan " according to current traffic condition.	
	2-3. Awareness and education activities of traffic safety are undertaken by using the developed education materials.	2-3. Education materials of road safety and record of awareness and education activities		Training for school teachers was conducted June 2022. Equipment / materials were distributed to teachers. Traffic Safety Workshop will be held in late 2022.	
3. Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.	3-1. The Pilot Project for restoration of the damaged causeway is undertaken during the Project period in cooperation with DOR and DWRI.	3-1. Implementation schedule of the pilot project		Construction of 3 pilot projects has started since end of September 2021. Procurement was conducted for 3 Bridges of Pilot PJT. There was more than 10 bid of each bridges.	
	3-2. The Project related issues including causeway disaster countermeasures are presented by individual counterpart at the workshops and the Joint Coordinating Committee (JCC) meetings.	3-2. Results of seminars and workshops, a manual and training reports		Technical Training on Asphalt Concrete Mix Design and Quality Control in Pavement Construction was held on Feb. 2021. Domestic Technical Tour was conducted in June 2022. Workshop for pilot project will be conducted in October 2022. Manual about the planning, investigation and design method of the causeway rehabilitation was completed and submitted June 2022.	

Activities	Inputs		Important Assumption
	The Japanese Side	The Nepalese Side	
1-1. Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN 1-2. Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2 1-3. Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project 1-4. Update the hazard map and road inventories of the Sindhuli Road 1-5. Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP 1-6. Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening 1-7. Conduct countermeasure works against water induced disasters beyond the right of way by DWRI 1-8. Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN 1-9. Convene regular meetings and monitoring for road operation and maintenance	1. Japanese experts - Chief advisor/Road administration - Deputy Chief Advisor/RoadO/M Planner - Road Structure Planner - Traffic safety Measure/Traffic Safety Education - Pavement Quality Control - Hydrologic Analysis/Flood Control - Road Structural Design - Road Disaster Prevention/EIS - Toll Road System/Pre-F/S of Rest Rrea - Coordination/Procurement/Social Evirmental Analysis 2. Pilot project for restoration of causeway disaster 3. Training in Japan or/and the third countries 4. In country training (technical study tour) 5. Local expenses for the Project activities	1. Counterpart Personnel (C/P) 【DOR】 - Project Director - Project Manager - Engineer - Sub-Engineer 【DWRI】 - Senior Divisional Hydrogeologist - River Disaster Expert (Civil Engineer) 【RBN】 - Senior Engineer 2. Expenses for the related Project activities and others specified in Basic Principles for Technical Cooperation 【DOR】 -Expense for operation and maintenance, and other safety measures of the Sindhuli Road 【DWRI】 -Expense for water induced disaster management works beyond the right of way 【RBN】 -Expense for introduction of the toll collection system 3. Provision of 4-WD vehicle for the site visit 4. Others	
2-1. Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents 2-2. Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan 2-3. Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users 2-4. Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local authorities 2-5. Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.) 2-6. Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities 2-7. Conduct a sharing workshop on road traffic safety 2-8. Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road			**Pre-Conditions** Most of the counterparts who were trained by the Phase 1 keep being deployed as counterparts of the Phase 2.
3-1. Conduct the site survey of the Sindhuli road and select the sites for pilot project 3-2. Conduct the natural condition surveys including EIA, topo. and geological investigations 3-3. Prepare the design, cost estimation and tender documents for the pilot project 3-4. Implementation of the pilot project in collaboration with DWRI 3-5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project 3-6. Prepare the manual about the planning, investigation and design method of the causeway rehabilitation 3-7. Conduct a sharing workshops on pilot project 3-8. Conduct a technical study tour in Nepal			**<Issues and countermeasures>**

ANNEX 4: R/D, M/M, Minutes of JCC

R/D

RECORD OF DISCUSSIONS

FOR

THE PROJECT FOR OPERATION AND MAINTENANCE
OF THE SINDHULI ROAD PHASE 2

IN

NEPAL

AGREED UPON BETWEEN

DEPARTMENT OF ROADS,

DEPARTMENT OF WATER INDUCED DISASTER MANAGEMENT,

ROADS BOARD NEPAL

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

April 11, 2018

Based on the minutes of meetings on the Detailed Planning Survey for the Project of the Operation and Maintenance for the Sindhuli Road Phase 2 (hereinafter referred to as "the Project") signed on February 2nd 2017 between Department of Roads, Department of Water Induced Disaster Management, Roads Board Nepal (hereinafter referred to as "the Counterpart") and the Japan International Cooperation Agency (hereinafter referred to as "JICA"), JICA held a series of discussions with the Counterpart and relevant organizations to develop a detailed plan of the Project.

The purpose of this record of discussions (hereinafter referred to as "the R/D") is to establish a mutual agreement for its implementation by the four parties and to agree on the detailed plan of the Project as described in the followings and the Annexes, which will be implemented within the framework of the Agreement on Technical Cooperation signed on September 3rd 2003 (hereinafter referred to as "the Agreement") and the Note Verbales to be exchanged between the Government of Japan and the Government of Nepal.

The Counterpart will be responsible for the implementation of the Project in cooperation with JICA, coordinate with other relevant organizations and ensure that the self-reliant operation of the Project is sustained during and after the implementation period in order to contribute toward social and economic development of Nepal.

The four parties also agreed that the Project will be implemented in accordance with the "Basic Principles for Technical Cooperation" published in December 2016, unless other arrangements are agreed in the R/D.

The R/D is delivered at Kathmandu, Nepal as of the day and year first above written. The R/D may be amended by a minutes of meetings among the four parties, except the plan of operation to be modified in monitoring sheets. The minutes of meetings will be signed by authorized persons of each side who may be different from the signers of the R/D.

Jun Sakuma
Chief Representative
JICA Nepal Office
Japan International Cooperation Agency

Gopal Prasad Sigdel
Director General
Department of Roads
Ministry of Physical Infrastructure and Transport

Madhukar Prasad Rajbhandari
Director General
Department of Water Induced Disaster Management
Ministry of Energy, Water Resources and Irrigation

Krishna Singh Basnet
Executive Director
Roads Board Nepal

Annex 1 Main Points Discussed
Annex 2 Project Design Matrix (PDM)
Annex 3 Plan of Operation (PO)
Annex 4 Implementation Structure
Annex 5 List of Proposed Members of Joint Coordinating Committee
Annex 6 Monitoring Form
Annex 7 Minutes of Meeting (February 2nd, 2017)

Annex 1

Main Points Discussed

1. **Framework of the Project**

   The four parties have agreed the Project Design Matrix (hereinafter referred to as "PDM") and Plan of Operation (hereinafter referred to as "PO") enclosed in the Annex 2 and 3 of R/D shall be used as a management tool of the Project. The PDM and PO will be reviewed and revised flexibly whenever the necessity arises.

2. **Title of the Project**

   The four parties have agreed the title of the Project is "the Project for Operation and Maintenance of the Sindhuli Road Phase 2."

3. **Duration of the Project**

   The four parties have agreed that the duration of the Project is three (3) years from the date of the first arrival of the JICA experts to Nepal based on the framework of the Project.

4. **Joint Coordinating Committee (JCC)**

   The four parties have agreed that the JCC constituted by the authorities concerned will be established and chaired by the Deputy Director General of the Foreign Cooperation Branch of DOR. The proposed members of the JCC are described in the Annex 5 of R/D. The first JCC will be convened within six months after the commencement of the Project to approve the first version of the PDM and PO. JCC will meet at least once a year and whenever necessity arises.

5. **Sindhuli Road Maintenance Unit (SRMU) and Sindhuli Road Disaster Management Unit (SRDMU)**

   For the effective implementation of the Project activities, the four parties have agreed that the following units will be established:

   - SRMU under the Foreign Cooperation Branch, DOR
   - SRDMU under the Disaster Mitigation and Management Division, DWIDM

6. **Counterpart Personnel**

   The four parties have agreed that the necessary counterpart personnel described in the PDM of the R/D will be assigned by the respective organization and informed to JICA before signing of R/D.

7. Pilot projects for restoration of damaged causeways of the Sindhuli Road

The four parties have agreed that two or three pilot projects for restoration of damaged causeways will be undertaken in the Section IV of the Sindhuli Road. These pilot projects will be undertaken under the Output 3 of the Project as part of technical transfer from the JICA experts to the counterpart personnel of SRMU/DOR and SRDMU/DWIDM. The four parties have confirmed that, at least at the moment, the pilot projects are less likely to cause land acquisition, and resettlement of residents and informal occupants. The environmental and social impacts and necessary considerations will be carefully analysed by the Project once the detailed design of pilot projects is determined. The four parties agreed that the necessary countermeasures will be taken based on the JICA Guidelines for Environmental and Social Considerations (April 2010) and the relevant laws and regulations of the Government of Nepal if the pilot projects are likely to have negative environmental and social impacts. In principle, the Team, DOR and DWIDM have agreed the division of responsibilities for implementation of the pilot projects will be the same as that of the pilot projects during the Phase 1, which is described below:

- JICA is responsible for the pilot project, and will bear the costs required for implementing the pilot project including the procurement of the contractor.
- DOR, as an executing agency, will bear the additional costs if required, and take the responsibility for the project management including land arrangement, settlement of disputes, coordination with the stakeholders, and so on.
- DWIDM, as a water induced disaster management agency, will bear the costs to manage water induced disasters beyond the right of way, if necessary.
- SRMU and SRDMU will conduct the construction management including quality control, progress control, payment certificate to the contractor, and so on.

8. Introduction of the toll collection system

For securing an adequate budget for operation and maintenance works of the Sindhuli Road, the four parties have agreed that the toll collection system will be introduced under the Output 1 of the Project. For this matter, DOR and RBN have agreed the division of responsibilities as follows:

- DOR will take the necessary arrangement to introduce the toll collection system.
- RBN will be responsible for procurement of the contractor for the toll collection system of the Sindhuli Road.

9. Indicators of the Overall Goal

The four parties agreed that the counterpart and the Japanese expert team should set the objectively measurable indicators and target values of the Overall Goal after the commencement of the Project, and consult JCC for their approval.

10. Vehicles

The Team, DOR and DWIDM have agreed that three vehicles of DOR (No.1 and No.2) and DWIDM (No.3) provided by JICA during the Phase 1 will be used exclusively for implementation of the Project.

11. Office Space for the JICA experts

DOR has informed to the Team that DOR is unable to provide the necessary office space for the JICA experts because of the shortage of office space of DOR including its Headquarters, which was resulted from the massive earthquake in 2015. The Team will recommend that JICA consider necessary measures for the certain period until DOR can provide the office space.

12. Official/Gratis visa

The Government of Nepal shall facilitate with concerned agencies and assist Japanese nationals/others from third countries who are involved in the Project to obtain official/gratis visa smoothly so that they can enter and stay in Nepal without any hindrance at the Project implementation stage.

Project Design Matrix (PDM)

Annex 2

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal

Implementing Agency: Department of Roads (DOR), Department of Water Induced Disaster Management (DWIDM) and Roads Board Nepal (RBN)

Target Group: Staff members of DOR, DWIDM and RBN

Period of Project: 2018 - 2021 (36 months)

Project Site: Sindhuli Road

Version_0
Dated April 10, 2018

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
The safe and smooth road traffic along the Sindhuli Road is maintained.	1. Fatality ratio per vehicle-km for the year of 2011 in all sections reduces by X% by 2023. 2. Road users' satisfaction to road maintenance and safety management and performance in all sections reaches 4.0 points in average. 3. DOR operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road effectively in cooperation with DWIDM and RBN. 4. DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWIDM.	1. Traffic accident report by the Sindhuli Road Maintenance Unit (SRMU)/Traffic data by the SRMU 2. Interview result of road users based on the traffic survey by the SRMU 3-1. An execution rate of road maintenance budget allocated by RBN and DOR for Sindhuli Road 3-2. Road inventory, disaster and maintenance records 3-3. Operation and maintenance records of EIS 3-4. Records of road safety countermeasures in the Road Safety Management Plan 4. Records of road disasters and road maintenance	The policy and direction on the road operation and maintenance are not drastically changed by the Government of Nepal (GON).		
Project Purpose					
The overall operation and maintenance system of the Sindhuli Road is strengthened.	1. A road closure caused by disasters does not continue for more than one day unless unexpected situation happens. 2. Surface distress index (SDI) on Sindhuli road keeps in less 2 point (in good condition) through a whole year. 3. A cooperative framework and the division of the responsibilities between DOR and DWIDM at the Ministry level are institutionalized.	1. Road maintenance record and hazard record 2. SDI record, Disaster record, Road maintenance record, Annual Work Plan 3. Agreement between DOR and DWIDM at the Ministry level	1. Road safety awareness campaign is conducted by various agencies such as Department of Transport Management, Traffic Police, media and other related agencies. 2. The budget and personnel necessary for the road operation and maintenance are to be allocated continuously.		

Outputs 1. Capacity to operate and maintain the Sindhuli Road is improved.	1-1. Routine, recurrent and periodic maintenance are conducted properly in accordance with the Annual Road Maintenance Plan (ARMP). 1-2. Specific and emergency maintenance for disaster including emergency response is conducted timely and properly. 1-3. Toll collection system is introduced in the Sindhuli Road in cooperation with DOR and RBN.	1-1-1. Maintenance budget allocated from RBN and DOR 1-1-2. An execution rate of the maintenance budget 1-1-3. Record of road maintenance work 1-2. Operation record of maintenance machineries including emergency equipment supplied by JICA 1-3. Toll collection system plan in the Sindhuli Road			
2. Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.	2-1. Emergency Information System (EIS) is operated and managed properly in sustainable manner. 2-2. Road safety management is undertaken in accordance with the Road Safety Management Plan. 2-3. Awareness and education activities of traffic safety are undertaken by using the developed education materials.	2-1. Operation and maintenance record of EIS 2-2. Road Safety Management Plan 2-3. Education materials of road safety and record of awareness and education activities			
3. Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Projects.	3-1. The Pilot Projects for restoration of the damaged causeways are undertaken and completed in cooperation with DOR and DWIDM. 3-2. The Project related issues including causeway disaster countermeasures are presented by individual counterpart at the workshops and the Joint Coordinating Committee (JCC) meetings.	3-1. Implementation schedule of the pilot project 3-2. Results of seminars and workshops, a manual and training reports			

Activities	Inputs		Important Assumption
	The Japanese Side	The Nepalese Side	
1-1. Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWIDM and RBN 1-2. Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2 1-3. Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project 1-4. Update the hazard map and road inventories of the Sindhuli Road 1-5. Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP 1-6. Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening 1-7. Conduct countermeasure works against water induced disasters beyond the right of way by DWIDM 1-8. Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN 1-9. Convene regular meetings and monitoring for road operation and maintenance 2-1. Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents 2-2. Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan 2-3. Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users 2-4. Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local authorities 2-5. Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.) 2-6. Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities 2-7. Conduct a sharing workshop on road traffic safety 2-8. Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road 3-1. Conduct the site survey of the Sindhuli road and select the sites for pilot projects 3-2. Conduct the natural condition surveys including EIA, topo. and geological investigations 3-3. Prepare the design, cost estimation and tender documents for the pilot projects 3-4. Implementation of the pilot projects in collaboration with DWIDM 3-5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project 3-6. Prepare the manual about the planning, investigation and design method of the causeway rehabilitation 3-7. Conduct a sharing workshops on pilot projects 3-8. Conduct a technical study tour in Nepal	1. Japanese experts - Chief advisor/Road administration - Road structure plan (pilot project) - Road maintenance management - Traffic safety/Traffic survey - Hydrologic analysis/River training - Structure design - EIS - Traffic safety education - Toll collection system - Coordination/ Procurement of equipment and contractor/ Environment analysis 2. Pilot projects for restoration of causeway disaster 3. Training in Japan or/and the third countries 4. In country training (technical study tour) 5. Provision of equipment - Total Station - Levelling machine - GI wire tensile strength testing machine - Automagtic rainfall guage - GPS with function of Geological compass - Mobile hot mix plant - Bitumen boiler - Hand roller - Portable compressor - rock dril - Jack hammer 6. Local expenses for the Project activities	1. Counterpart Personnel (C/P) 【DOR】 - Project Director - Project Manager - Engineer - Sub-Engineer 【DWIDM】 - Senior Divisional Hydrogeologist - River Disaster Expert (Civil Engineer) 【RBN】 - Senior Engineer 2. Expenses for the related Project activities and others specified in Basic Principles for Technical Cooperation 【DOR】 -Expense for operation and maintenance, and other safety measures of the Sindhuli Road 【DWIDM】 -Expense for water induced disaster management works beyond the right of way 【RBN】 -Expense for introduction of the toll collection system 3. Provision of 4-WD vehicle for the site visit 4. Others	**Pre-Conditions** Most of the counterparts who were trained by the Phase 1 keep being deployed as counterparts of the Phase 2. **<Issues and countermeasures>**

Plan of Operation (PO)

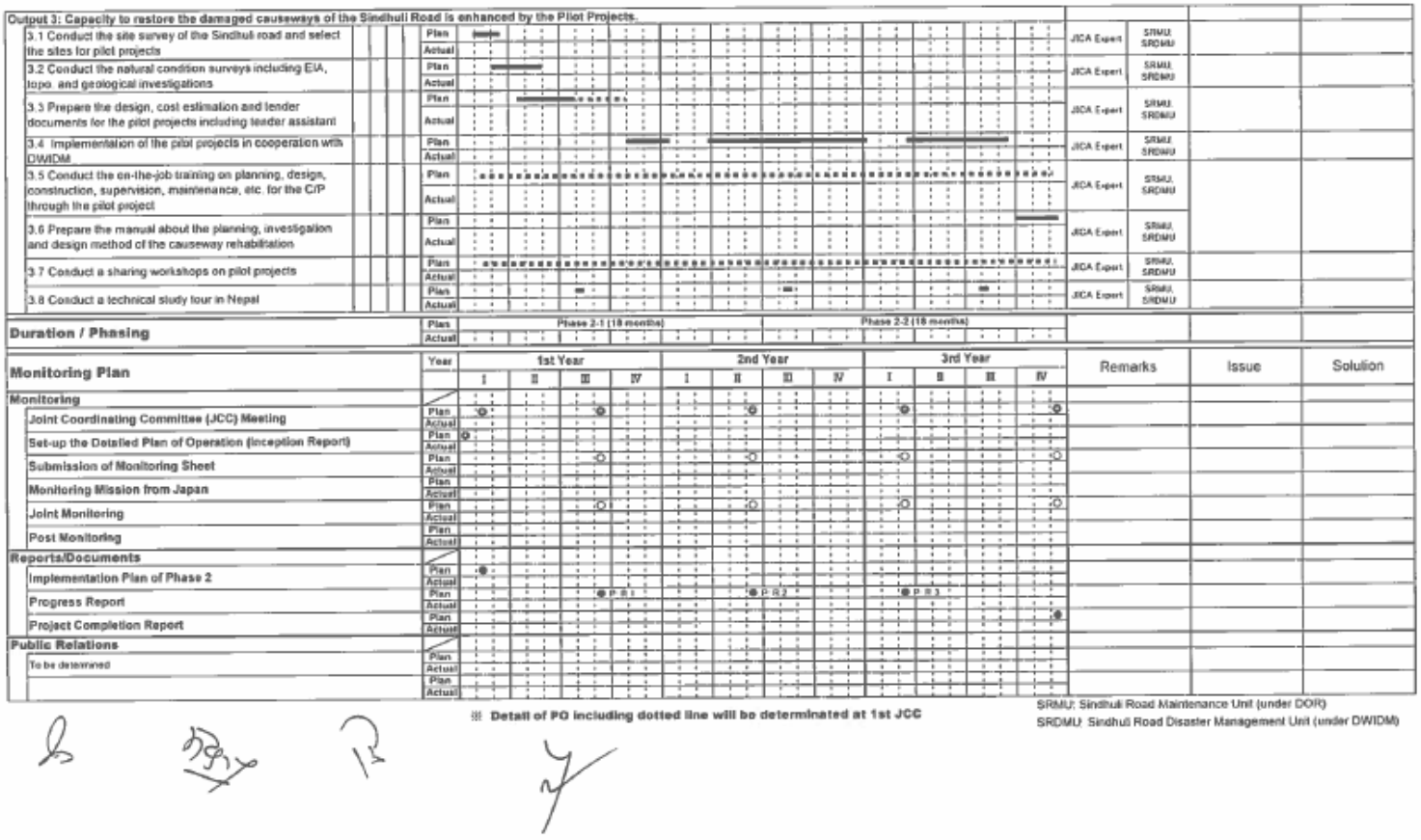
Annex 3

Version 0　Date: April 10, 2018

Project Title: The project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal

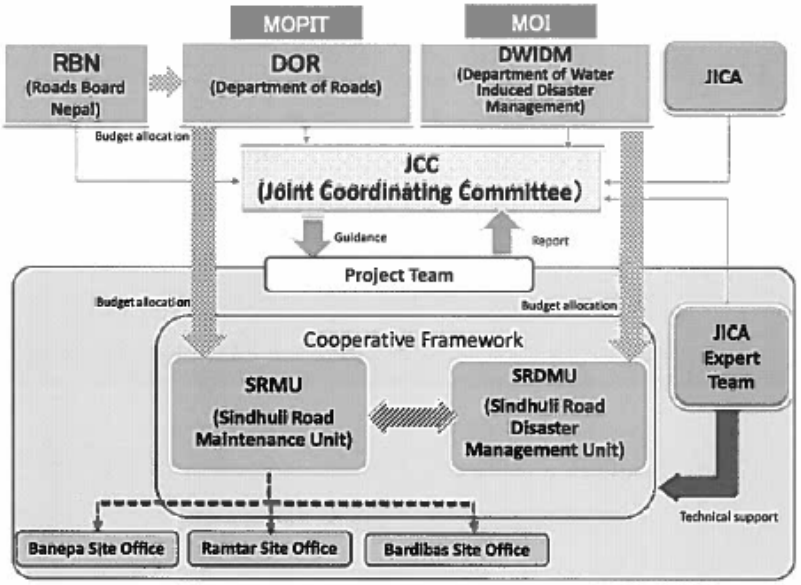
Inputs	Year	1st Year				2nd Year				3rd Year				Remarks	Monitoring	
		I	II	III	IV	I	II	III	IV	I	II	III	IV		Issue	Solution
		1 2 3 4 5 6	7 8 9 10 11 12	13 14 15 16 17 18	19 20 21 22 23 24	25 26 27 28 29 30	31 32 33 34 35 36									
Expert																
1. Chief advisor/Road administration	Plan															
	Actual															
2. Road structure plan (pilot project)	Plan															
	Actual															
3. Road maintenance management	Plan															
	Actual															
4. Traffic safety/Traffic survey	Plan															
	Actual															
5. Hydrologic analysis/River training	Plan															
	Actual															
6. Structure design for causeway structure	Plan															
	Actual															
7. Emergency Information System (EIS)	Plan															
	Actual															
8. Traffic safety education	Plan															
	Actual															
9. Toll collection system	Plan															
	Actual															
10. Coordination/Procurement of equipment and contractor/Environment analysis	Plan															
	Actual															
Equipment	Plan															
To be determined	Actual															
Training in Japan	Plan															
To be determined	Actual															
Third country Training	Plan															
To be determined	Actual															

Activities / Sub-Activities	Year	1st Year I	1st Year II	1st Year III	1st Year IV	2nd Year I	2nd Year II	2nd Year III	2nd Year IV	3rd Year I	3rd Year II	3rd Year III	3rd Year IV	Responsible Organization: Japan	Responsible Organization: Nepal	Achievements	Issue & Countermeasures
Output 1: Capacity to operate and maintain the Sindhuli Road is improved.																	
1.1 Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWIDM and RBN	Plan													JICA Expert	SRMU, SRDMU, RBN		
	Actual																
1.2 Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2	Plan													JICA Expert	SRMU		
	Actual																
1.3 Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project	Plan													JICA Expert	SRMU, SRDMU, RBN		
	Actual																
1.4 Update the hazard map and road inventories of the Sindhuli Road	Plan													JICA Expert	SRMU		
	Actual																
1.5 Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP	Plan													JICA Expert	SRMU		
	Actual																
1.6 Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening	Plan													JICA Expert	SRMU		
	Actual																
1.7 Conduct countermeasure works against water induced disasters beyond Right of Way by DWIDM	Plan													JICA Expert	SRDMU		
	Actual																
1.8 Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN	Plan													JICA Expert	SRMU, RBN		
	Actual																
1.9 Convene regular meetings and monitoring for road operation and maintenance	Plan													JICA Expert	SRMU, SRDMU, RBN		
	Actual																
Output 2: Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.																	
2.1 Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents	Plan													JICA Expert	SRMU		
	Actual																
2.2 Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan	Plan													JICA Expert	SRMU		
	Actual																
2.3 Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users	Plan													JICA Expert	SRMU		
	Actual																
2.4 Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local administration	Plan													JICA Expert	SRMU		
	Actual																
2.5 Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.)	Plan													JICA Expert	SRMU		
	Actual																
2.6 Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities	Plan													JICA Expert	SRMU		
	Actual																
2.7 Conduct a sharing workshop on road traffic safety	Plan													JICA Expert	SRMU		
	Actual																
2.8 Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road	Plan													JICA Expert	SRMU		
	Actual																


Output 3: Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Projects.
3.1 Conduct the site survey of the Sindhuli road and select the sites for pilot projects
3.2 Conduct the natural condition surveys including EIA, topo. and geological investigations
3.3 Prepare the design, cost estimation and tender documents for the pilot projects including tender assistant
3.4 Implementation of the pilot projects in cooperation with DWIDM
3.5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project
3.6 Prepare the manual about the planning, investigation and design method of the causeway rehabilitation
3.7 Conduct a sharing workshops on pilot projects
3.8 Conduct a technical study tour in Nepal
Plan
Actual
JICA Expert
SRMU, SRDMU
Duration / Phasing
Phase 2-1 (18 months)
Phase 2-2 (18 months)
Monitoring Plan
Year
1st Year
2nd Year
3rd Year
I
II
III
IV
Remarks
Issue
Solution
Monitoring
Joint Coordinating Committee (JCC) Meeting
Set-up the Detailed Plan of Operation (Inception Report)
Submission of Monitoring Sheet
Monitoring Mission from Japan
Joint Monitoring
Post Monitoring
Reports/Documents
Implementation Plan of Phase 2
Progress Report
P R 1
P R 2
P R 3
Project Completion Report
Public Relations
To be determined
※ Detail of PO including dotted line will be determinated at 1st JCC
SRMU: Sindhuli Road Maintenance Unit (under DOR)
SRDMU: Sindhuli Road Disaster Management Unit (under DWIDM)

Annex 4

Implementation Structure



Annex 5

List of Proposed Members of Joint Coordinating Committee

(1) Chairperson
-Project Director, (Deputy Director General of Foreign Cooperation Branch, DOR)

(2) Members of the Nepalese Side
-Deputy Director General of Disaster Mitigation and Management Division, DWIDM
-Technical Director of RBN
-Project Manager (DOR)
-Counterpart personnel from DOR
-Counterpart personnel from DWIDM
-Counterpart personnel from RBN
-Representatives from related implementing agencies, if necessary

(3) Members of the Japanese Side
-Japanese Experts
-Representative from JICA
-Other personnel to be dispatched by JICA

(4) Others
The JCC can invite any related persons to discuss specific issues.

Annex 6

TO CR of JICA ●● OFFICE

PROJECT MONITORING SHEET

Project Title :

Version of the Sheet: Ver.●●　(Term: Month, Year - Month, Year)

Name:

Title: Chief Advisor

Submission Date:

I. Summary

1　Progress

1-1 Progress of Inputs

1-2 Progress of Activities

1-3 Achievement of Output

1-4 Achievement of the Project Purpose

1-5 Changes of Risks and Actions for Mitigation

1-6 Progress of Actions undertaken by JICA

1-7 Progress of Actions undertaken by Gov. of ●●

1-8 Progress of Environmental and Social Considerations (if applicable)

1-9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

1-10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

2　Delay of Work Schedule and/or Problems (if any)

2-1 Detail

2-2 Cause

2-3 Action to be taken

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of●●,etc.)

3　Modification of the Project Implementation Plan

3-1 PO

3-2 Other modifications on detailed implementation plan

(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)

Annex 6

4 Preparation of Gov. of•• toward after completion of the Project

II. Project Monitoring Sheet I & II *as Attached*

Annex 6

Project Monitoring Sheet I　(Revision of Project Design Matrix)

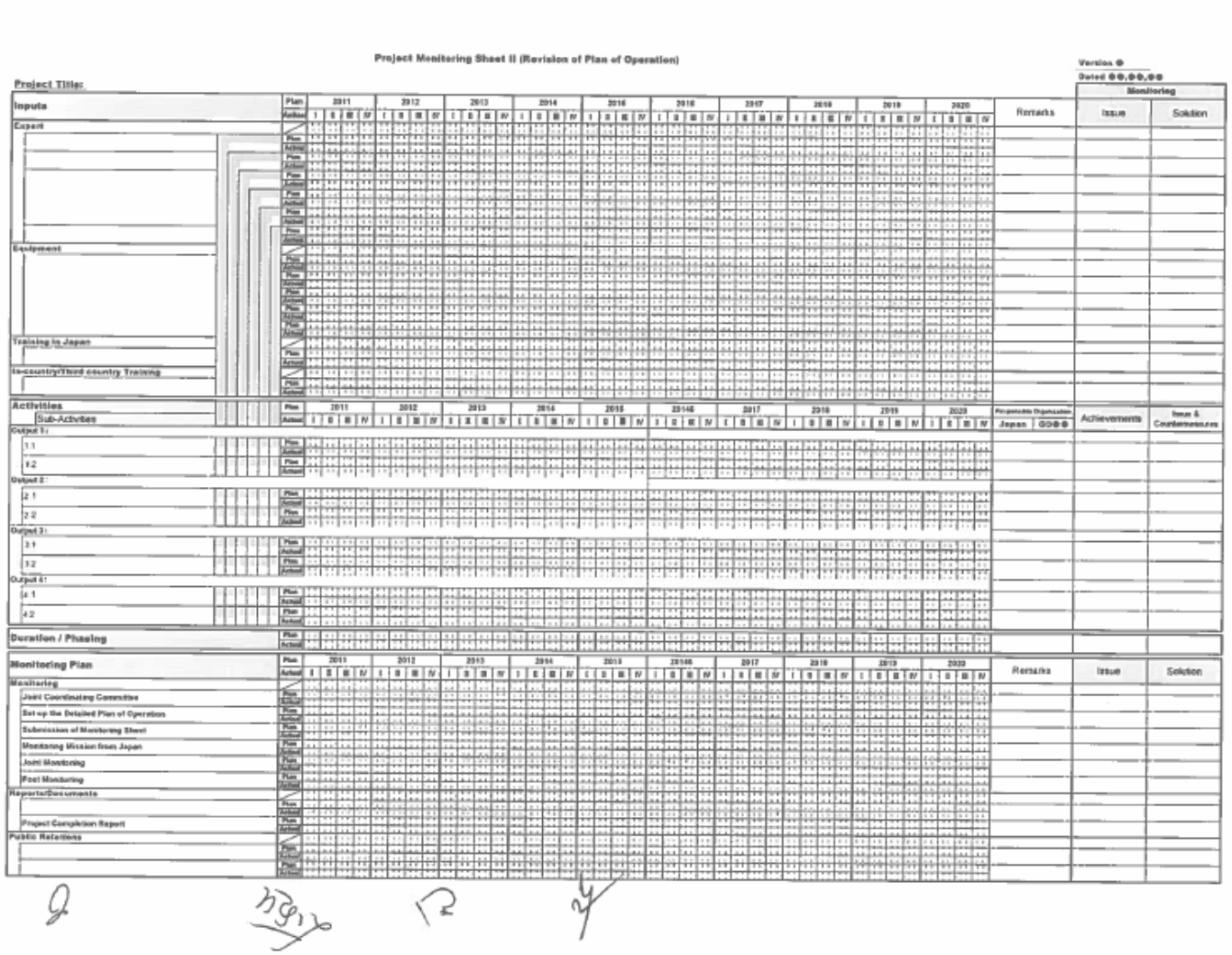
Project Title:
Implementing Agency:
Target Group:
Period of Project:
Project Site:　**Model Site:**

Version
Dated ●●,●●,●●

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
Project Purpose					
Outputs					

Annex 6

Activities	Inputs		Important Assumption
	The Japanese Side	The Nepal Side	
			Pre-Conditions
			<Issues and countermesures>


Project Monitoring Sheet II (Revision of Plan of Operation)
Project Title:
Inputs
Expert
Equipment
Training in Japan
In-country/Third country Training
Activities
Sub-Activities
Output 1:
1.1
1.2
Output 2:
2.1
2.2
Output 3:
3.1
3.2
Output 4:
4.1
4.2
Duration / Phasing
Monitoring Plan
Monitoring
Joint Coordinating Committee
Set up the Detailed Plan of Operation
Submission of Monitoring Sheet
Monitoring Mission from Japan
Joint Monitoring
Post Monitoring
Reports/Documents
Project Completion Report
Public Relations
Plan
Actual
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Remarks
Monitoring
Issue
Solution
Achievements
Issue & Countermeasures

MOM on R/D

MINUTES OF MEETINGS
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
DEPARTMENT OF ROADS,
DEPARTMENT OF WATER RESOURCES AND IRRIGATION,
ROADS BOARD NEPAL
FOR AMENDMENT OF THE RECORD OF DISCUSSIONS
ON
THE PROJECT FOR OPERATION AND MAINTENANCE OF THE SINDHULI ROAD PHASE 2

Japan International Cooperation Agency (hereinafter referred to as "JICA") and Department of Roads, Department of Water Resources and Irrigation, Roads Board Nepal hereby agree that the Record of Discussions on the Project for Operation and Maintenance of the Sindhuli Road Phase 2 signed on April 11, 2018 will be amended as follows;

1. Duration of the Project

Before	Amended Version
The four parties have agreed that the duration of the Project is three (3) years from the date of the first arrival of the JICA experts to Nepal based on the framework of the Project.	The four parties agreed that the duration of the Project is four (4) years from the date of the first arrival of the JICA Experts to Nepal based on the framework of the Project.
Reason: Due to the spread of COVID-19, some of the project activities have not been implemented yet. In order to achieve the project purpose, it is considered that the duration of the Project is needed to be extended one (1) year, based on the discussion on the 4th Joint Coordination Committee held on December 21, 2020, to secure sufficient time for conducting remaining activities of the Project.	

This amendment will become effective as of February 1, 2021.

Kathmandu, February 18, 2021

For
Japan International Cooperation Agency

ASAKUMA Yumiko
Chief Representative
JICA Nepal Office

For
Ministry of Physical Infrastructure and Transport

Ajun Jung Thapa
Director General
Department of Roads

For
Ministry of Energy, Water Resources and Irrigation

Madhukar Prasad Rajbhandari
Director General
Department of Water Resources and Irrigation

For
Roads Board Nepal

Sushil Babu Dhakal
Executive Director

End

Attachment 1: Record of Discussions (signed on April 11, 2018)
Attachment 2: Minutes of Meeting on 4th Joint Coordinating Committee (JCC) Meeting

Minutes of JCC

Minutes of 1st JCC

DEPARTMENT OF ROADS
MINISTRY OF PHYSICAL INFRASTRUCTURE AND TRANSPORT
GOVERNMENT OF NEPAL

MINUTES OF MEETING
ON
1st JOINT COORDINATING COMMITTEE (JCC)
MEETING
FOR
THE PROJECT FOR THE OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD PHASE 2

April 25, 2019

Sindhuli Road Maintenance Unit (SRMU)
JICA Expert Team

MINUTES OF MEETING
ON
1st JCC MEETING
FOR
THE PROJECT FOR THE OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD PHASE 2

Date & Time : 25th April 2019, 13:00 – 16:00
Place of Meeting : Meeting Hall, Department of Road (DOR, Chakupat, Patandhoka, Lalitpur)
Participants : See attached participants list **(Annex 1)**

Agenda:

1. Opening of 1st Joint Coordinating Committee (Mr. Arjun Jung Thapa, DDG, DOR)
2. Remarks on Road Maintenance against Water Induced Disasters (Mr. Pradeep Thapa, DDG, DWRI)
3. Remarks on Toll Road System in Nepal (Er. Krishna Singh Basnet, RBN~~ド~~ ED
4. Current Situation of the Sindhuli Road (Mr. Surya B. Bhat, Project Manager, DOR)
5. Briefing the Project Outline (Mr. H. Shinkai, JICA Expert)
6. Pilot Project & Priority Project (Mr. H. Fujisawa, JICA Expert)
7. Introduction of Toll System (Mr. H. Shinkai, JICA Expert)
8. Pavement Issues in Sec. IV (Mr. I. Midorikawa, JICA Expert)
9. O/M issues on the exiting EIS and proposed additional EIS (Mr. A.K. Karna, JICA Expert)
10. Current Traffic Accident Situations and Issues (Mr. B. S. Rana, JICA Expert)
11. Monitoring Sheet and Other Issues to be confirmed (Mr. H. Shinkai, JICA Expert)
12. Remarks (Ms. Y Asakuma, Chief Representative, JICA Nepal Office)
13. Closing Remarks (Mr. Surya B. Bhat, Project Manager, DOR)

In accordance with the Record of Discussion (hereinafter referred to as "R/D") for the Project of the Operation and Maintenance of the Project Phase 2 (hereinafter referred to as "Project"), the Department of Roads (hereinafter referred to as the "DOR") held the Joint Coordinating Committee Meeting (hereinafter referred to as JCC) to discuss and approve the various agenda of the Project on April 25, 2019 at the Meeting Hall of DOR, Head Office, Chakupat, Lalitpur.

The proceedings of JCC-1 Meeting have been presented below.

1. Opening Remarks by the Chair-person Mr. Arjun Jung Thapa, the Deputy Director General, Development Cooperation Implementation Division, DOR

   In his opening remarks, Mr. Thapa welcomed all participants and thanked the Government of Japan (GoJ) for supporting the Project. The project will help for restoration of the damaged section due to the recent earthquakes, some bridges and operation and maintenance of the road for the period of 2018-2024. DOR and Mr. Thapa will extend full cooperation to the Project.

2. After self-introduction by the participants, Mr. Pradeep Thapa, JCC Member representing DWRI

expressed his pleasure on participating in this meeting. He explained the recent set up of DWRI (after merging of DOI and DWIDM earlier) under Ministry of Energy Water Resources and Irrigation. He also recalled the countermeasures for water induced disasters adopted in eighteen different locations in SRMU Project period. Significant fund was allotted for Sindhuli Road for last few years and same will be continued in the upcoming years.

3. Mr. Krishna Singh Basnet, the Executive Director of Roads Board Nepal addressed to the meeting, highlighting the history of tolling culture of Nepal for last more than 20 years with the aim of sustainability of road maintenance. He further spoke about the role of RBN in coordination with the DOR. He also informed to the meeting that Government of Nepal has recently revised new toll rates and notified to the public through gazette; and many roads have been brought under toll system by the Government. Since, RBN is still at the initial stage, he expects appropriate technical assistance to Nepal from JICA for the improvement of prevailing toll system.

4. Mr. Surya B. Bhat, the Project Manager of Suryabinayak - Dhulikhel, Dhulikhel - Sindhuli - Bardibas Road Project presented in brief about the background, problems, issues and way forward of the Project. He also explained about some of the achievements of the project obtained in recent past.

5. Mr. H Shinkai, the Chief Advisor of JICA Expert Team presented Outline of the Work Plan including the historical background of Sindhuli Road Project covering the concept applied for study, design, construction and maintenance of the Project. He also emphasized that in order to maintain the function of the Sindhuli Road, it is necessary for Japan and Nepal to work together to strengthen maintenance and management capability of the Sindhuli Road.

6. Mr. H. Fujisawa, the JICA Expert, presented in brief about Pilot Project & Priority Projects (damaged sites of causeway/ roadway were recognized in 2017 through the pre-survey for the Project for the Operation and Maintenance of the Sindhuli Road Phase 2) and their restoration program. He also presented the outline design of these projects.

Comments by DDG of DOR, JCC:

(1) DOR agrees with JICA's proposal that there will be one pilot project with JICA funds and two priority projects with DOR's funds.

(2) For the two priority projects to be implemented by the Nepalese side, DOR requests JICA Expert team to consider (propose) bridge structure based on the Nepal Standard Design Specifications and transfer the bridge technology including bridge design.

(3) Sindhuli Road is the National Road No. H06, therefore, the causeway restoration should basically be of two lanes based on DOR design criteria.

7. Mr. H. Shinkai, the Chief Advisor, JICA Expert Team, presented about the Introduction of Toll Road System

Comments by E.D of RBN, and member of the JCC:

(1) The introduction of toll system in the Sindhuli Road was decided by the Nepalese Government and toll section including toll rate to be applied for the Sindhuli Road was already described in the official gazette as follows:

Toll Section of Sindhuli Road	Length (Km)	Toll Fare (NRs.)		
		Heavy	Light V	Two Wheel
(1) Dhulikhel - Khurkot	87	125	50	15
(2) Khurkot - Sindhuli- Bardibas	73	115	45	15

(2) RBN considers that the toll collection system to be applied for the Sindhuli Road is automatic collection system in the future, however, it will be the manual method instead of the automatic

collection system for the time being.

(3) The dispatch of JICA toll road expert will be discussed promptly after the 1st JCC meeting, including the need and the timing of the dispatch.

8. Pavement Issue by Mr. I. Midorikawa

(1) JICA expert pointed out that there are some problems with the quality of overlay work recently implemented in Section-IV and the needs for strengthening quality control and construction management for both DOR and a contractor.

(2) JICA expert also advised DOR to check the contract documents regarding the preparation work before constructing overlay for the next contract section of the Section-IV since the procurement of contractor will be completed and overlay construction will be started soon.

9. O/M Issues and Proposed Additional EIS by Mr. A. K. Karna

(1) JICA expert pointed out that the existing EIS is not working well due to insufficient communication between the Sindhuli Road Project Office and OM contractor and advised DOR to handover the O/M of EIS from the Project office to the HMIS unit of Headquarters.

(2) JICA experts also advised that the DOR is requested to secure the budget in the next year GON budget for provision of additional 2 Nos. of automatic rainfall gauges near Nepalthok and 3 Nos. of RIB which will be installed at Khurkot.

(3) JICA expert advised to upgrade the function of EIS to meet the requirement for road maintenance management purpose by incorporating Web-based system to the current EIS

10. Traffic Safety and Traffic Issues by Mr. B.S. Rana

(1) Current situation of traffic volume and traffic accidents on the Sindhuli Road were reported by JICA expert and necessary improvement measures including the preparation of traffic teaching materials were pointed out.

(2) JICA expert also explained the schedule of traffic survey including the survey method, which will be conducted in May 2019.

11. Monitoring Sheet and others to be confirmed by Mr. H. Shinkai

(1) Monitoring Sheet:

The progress of Phase 2 will be reported using the monitoring sheet which consists of Summary Sheet including technical report, PDM sheet and OP sheet at every six (6) months after JCC Meeting.

(2) Finalization of Work Plan of Phase 2

The draft work plan of Phase 2 presented by JICA experts during the 1st JCC meeting was accepted by DOR, DWRI and RBN in principle. The comments made by the JCC meeting should be incorporated into the works plan and submitted to the 2nd JCC Meeting for final approval.

(3) Utilization of Vehicle

DOR and DWRI agreed to take the necessary processes of transferring ownership at own cost from JICA blue number plate to Nepalese Government white number plate of the vehicles which were handed over to DOR and DWRI during the Phase 1.

3

In addition, DOR and DWRI agreed to give a priority right for utilization of the Vehicle (2 Nos) to JICA experts for site visit. The operation and maintenance costs including fuel, driver, insurance, repair, etc.) shall be borne by Nepalese side in accordance with the R/D.

(4) Office Space for JICA Expert Team

DOR agreed to provide JICA Expert Team with the necessary office space after one year, if the office space environment is improved.

(5) Counterpart Personnel for the Project

Both parties agreed the counterpart personnel for the project as follows;

DOR: six (6) engineers, DWRI: two (2) engineers, RBN (1) engineer

12. Remarks by Chief Representative, JICA Nepal Office

The Chief Representative of JICA Nepal office addressed to the meeting and expressed her happiness for participating in this JCC-1 meeting. SRMU-2 is an important project for Nepal and outside. The Sindhuli Road connects Terai and hill. Operation and maintenance are very important. Finally, she extended her full support to this Project.

13. Closing Remarks by Project Manager, DOR

Mr. Surya B. Bhat, the Project Manager of Sindhuli Road Project and with the consent from the Chairperson, thanked to the representative of Embassy of Japan, Chief Representative of JICA and other members, Executive Director of RBN, DDGs of DOR and DWRI, members of JICA Experts Team and all other participants of the Meeting. The suggestions from the presenters are found very good and will be incorporated in the Project. Finally, he closed the Meeting

After a constructive discussion and having a confirmation of cooperation to implement the Project, the 1st JCC meeting was closed at 16:00 PM on April 25, 2019.

Arjun Jung Thapa
Deputy Director General, Project Director
Department of Roads

Pradeep Thapa
Deputy Director General
Department of Water Resources and Irrigation

Krishna Singh Basnet
Executive Director
Roads Board Nepal

Yumiko Asakuma (Ms.)
Chief Representative
JICA Nepal Office
Japan International Cooperation Agency

Hiroki Shinkai
Chief Advisor of the Project
JICA Expert Team
Japan International Cooperation Agency

4

Annex of Minutes of Meeting
List of Participants

THE PROJECT FOR THE OPERATION AND MAINTENANCE OF THE SINDHULI ROAD PHASE 2

The Project for Operation and Maintenance of the Sindhuli Road Phase 2

1st JOINT COORDINATING MEETING

Date : 25th April, 2019
Time : 13:00 to 16:00
Venue : DOR Conference Room

Attendee List - 1

No.	Name	Organization	Position	Signature
1	Mr. Arjun Jung Thapa	DOR/DCID	Chairman/ DDG	
2	Mr. Pradeep Thapa	DWRI	DDG	
3	Mr. Krishna Singh Basnet	RBN	Executive Director	
4	Mr. Surya Bahadar Bhat	DOR	PM, SDDSBRP, C/P	
5	Ms. Shila Shrestha	DOR	Engineer, SDDSBRP, C/P	
6	Ms. Bimala Dhami	DOR	Engineer, SDDSBRP, C/P	
7	Mr. Basudev Timilsina	DWRI	SDE	
8	Mr. Krishna Bahadur Pandey	DWRI	Engineer, C/P	
9	Mr. Sanu Babu Prajapati	RBN	Sr. Engineer, C/P	
10	Ms. Jyotshana Subedi	DOR	Sub-eng., SDDSBRP	
11	Ms. Srijana Lekhak	DOR	Sub-eng., SDDSBRP	
12	Ms. Rasmita Basnet	DOR	Sub-eng., SDDSBRP	
13	Mr. Yoshiki SANDO	Embassy of Japan	Second Secretary	Yoshiki SANDO
14	Ms. Yumiko ASAKUMA	JICA Nepal	Chief Representative	
15	Mr. ~~Tatsuji~~ Tatsuhito KONDO	JICA Nepal	Representative	
16	Mr. Sourab Rana	JICA Nepal	Program Officer	
17	Mr. Siddhartha Shrestha	Embassy of Japan	Program Officer	
18	Chhabi Lal paudel	DOR	Engineer	
19	DIP BARAHI	DOR, RSTU	SDE	
20				

1/2

Annex of Minutes of Meeting
List of Participants

THE PROJECT FOR THE OPERATION AND MAINTENANCE OF THE SINDHULI ROAD PHASE 2

The Project for Operation and Maintenance of the Sindhuli Road Phase 2

1st JOINT COORDINATING MEETING

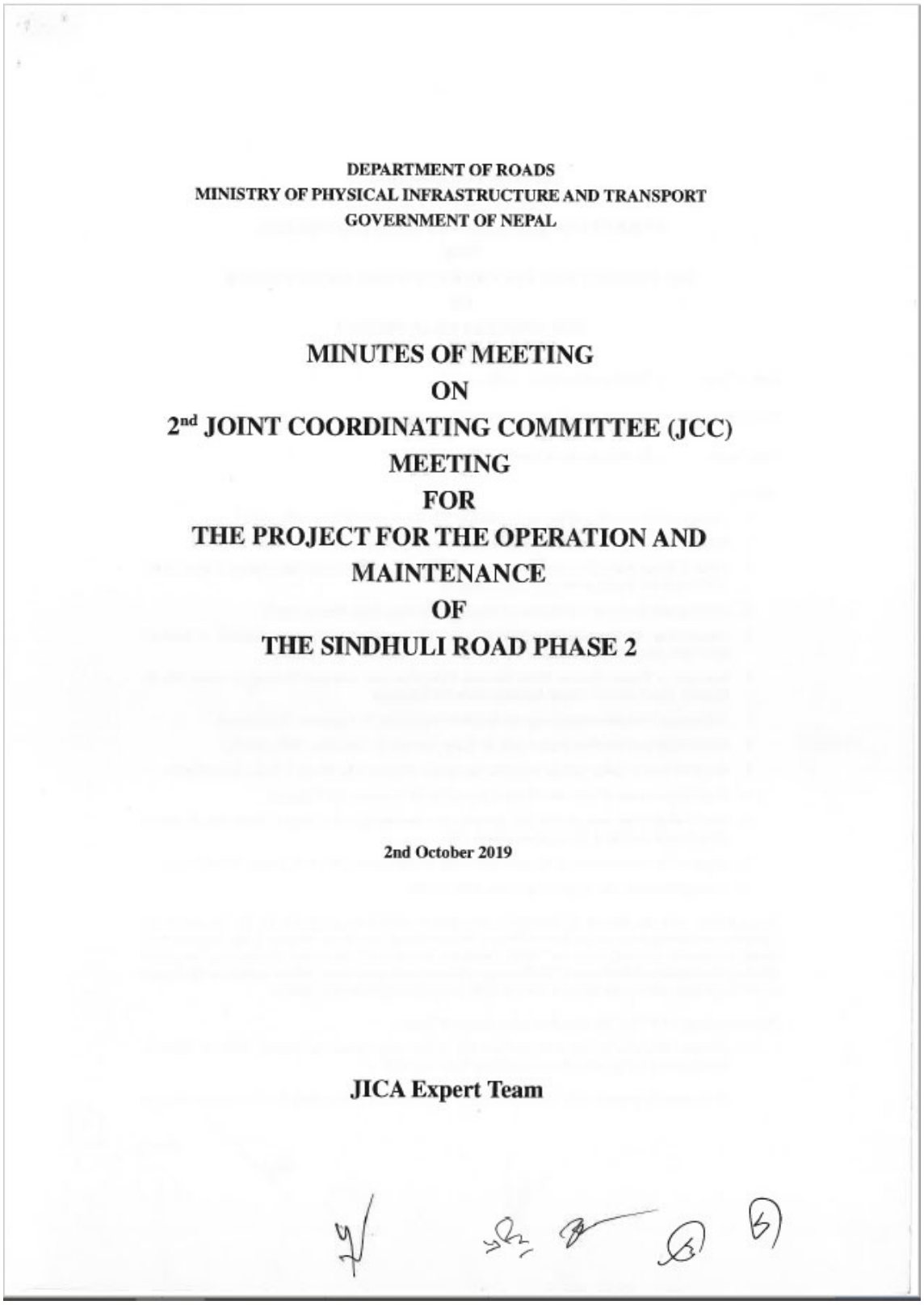
Date : 25th April, 2019
Time : 13:00 to 16:00
Venue : DOR Conference Room

Attendee List - 2

No.	Name	Organization	Position	Signature
1	Mr. Hiroki SHINKAI	JICA Expert	Chief Advisor	
2	Mr. Motoki IWAMARU	JICA Expert	Deputy Chief Advisor	
3	Mr. Hiroshi FUJISAWA	JICA Expert	Road Structure Planner	
4	Mr. Bindu S. RANA	JICA Expert	Traffic Safety Measures	
5	Mr. Izumi MIDORIKAWA	JICA Expert	Pavement Quality Control	
6	Mr. Khadananda LAMSAL	JICA Expert	Hydrologic Analysis	
7	Mr. Ramesh P. KOIRALA	JICA Expert	Road Structural Design	
8	Mr. Akhilesh K. KARNA	JICA Expert	Road Disaster Prevention	
9	Mr. Kiyoshi NARITA	JICA Expert	Toll Road System	
10	Mr. Keita IRINO	JICA Expert	Coordination/ Procurement	
11	Mr. Sakar Adhikari	SRMP2	Road Pavement Maintenance	
12	Mr. Santosh Rai	SRMP2	Secretary	
13	Mr. Rajendra Shresta	SRMP2	Computer Operator	
14	Ms. Apeksha Purja Magar	SRMP2	Assistant	
15				
16				
17				
18				
19				
20				

2/2

Minutes of 2nd JCC



DEPARTMENT OF ROADS
MINISTRY OF PHYSICAL INFRASTRUCTURE AND TRANSPORT
GOVERNMENT OF NEPAL

MINUTES OF MEETING
ON
2nd JOINT COORDINATING COMMITTEE (JCC)
MEETING
FOR
THE PROJECT FOR THE OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD PHASE 2

2nd October 2019

JICA Expert Team

MINUTES OF MEETING
ON
2nd JOINT COORDINATION COMMITTEE MEETING
FOR
THE PROJECT FOR THE OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD PHASE 2

Date & Time : 26th September 2019, 13:00 – 17:00

Place of Meeting : Meeting Hall, Department of Roads' (DOR, Chakupat, Patandhoka, Lalitpur)

Participants : See attached participants list **(Annex)**

Agenda:

1. Opening of 2nd Joint Coordinating Committee (Mr. Arjun Jung Thapa, DDG, DOR)
2. Remarks (Ms. Y Asakuma, Chief Representative, JICA Nepal Office)
3. Sunkosi Marin Water Diversion Project and its effect to Sindhuli Road (Mr. Pradeep Thapa, DDG, DWRI and Mr. Sushil Acharya, Project Director)
4. Development Policy of Toll System in Nepal (Er. Krishna Singh Basnet, RBN)
5. Annual Road Maintenance Plan 2019/2020 and Concept of the Future Development of Sindhuli Road (Mr. Surya B. Bhat, Project Manager, DOR)
6. Indicator of Project Goal in PDM, Revised Work Plan and Technical Training in Japan (Mr. H. Shinkai, Chief Advisor / Road Administration, JICA Expert)
7. Preliminary Evaluation and Design of the Pilot Project (Mr. H. Fujisawa, JICA Expert)
8. River Training of the Pilot Project (Mr. B. Yadav and Mr. B. Timilsina, SDEs, DWRI)
9. Result of Traffic Safety Survey & Traffic Accidents Analysis (Mr. Bindu S. Rana, JICA Expert)
10. Road Improvement Plan of the Sindhuli Road (Mr. M. Iwamaru, JICA Expert)
11. Pre-FS of the Rest Area and the Toll System to be introduced in the Sindhuli Road (Mr. K. Narita, JICA Expert and Mr. S. B. Prajapati, RBN, C/P)
12. Proposal for Improvement of EIS and Additional Infrastructures (Mr. A.K. Karna, JICA Expert)
13. Closing Remarks (Mr. Arjun Jung Thapa, DDG DOR)

In accordance with the Record of Discussion (hereinafter referred to as "R/D") for the Project of the Operation and Maintenance of the Project Phase 2 (hereinafter referred to as "Project"), the Department of Roads (hereinafter referred to as the "DOR") held the Second (2nd) the Joint Coordinating Committee Meeting (hereinafter referred to as JCC) Meeting to discuss and approve the various agenda of the Project on 26th September 2019 at the Meeting Hall of DOR, Head Office, Chakupat, Lalitpur.

The proceedings of 2nd JCC Meeting have been presented below.

1. Opening Remarks by the Chair-person Mr. Arjun Jung Thapa, the Deputy Director General, Development Cooperation Implementation Division, DOR

   In his opening remarks, Mr. Thapa welcomed all participants and thanked the Government of Japan

(GoJ) for supporting the Project. He informed to the meeting that Government of Nepal has felt the necessity of widening of the Sindhuli Road to accommodate drastically increased traffic at present. Government of Nepal is availing fund by itself with support of technical aspects from JICA Expert Team. In addition, the design of three bridges is going on. The manual of design of the design of the bridge (RC Continuous slab bridge) can be used by the DOR at other places which could be fruitful assistance from JICA and GOJ. He has expected that JICA Expert Team will provide needful support.

2. Remarks by Chief Representative, JICA Nepal Office

   After self-introduction by the participants, the Chief Representative of JICA Nepal office addressed to the meeting and expressed her happiness for participating in this 2nd JCC meeting. She also recalled JCC-1 meeting which she attended 5 months before. The JCC meeting, being as a forum, provides opportunity for better coordination and understanding the project. She highlighted the importance of annual road maintenance, utilization of infrastructures, road safety and road traffic safety. While crossing typical Nepali land like mountain, valley and riverside, Sindhuli Road has many challenges it faces. The role of Department of Roads is very important. The expertise of expert team for technology transfer is also important. She also recalled another grant project, Earthquake Rehabilitation Project on Sindhuli Road which is undergoing now. She elucidated about the importance of the Emergency Information System. In the present days of technical advancement, information sharing through EIS is very important for road users. She also spoke about the capacity building of the counterparts for this project through technical training for ten members in Japan to be organized shortly and hoped that learning from the training will be applied in Nepal.

3. Mr. Pradeep Thapa, JCC Member representing Department of Water Resources and Irrigation (hereinafter referred to as "DWRI)) said that in order to ensure year-round irrigation to the agriculture field, DWRI has started inter-basin transfer project and Sunkosi Marin Diversion Multipurpose Project (SMDMP) is one of such projects. This project will provide irrigation facility covering 122,000 Ha. This project also generates about 27MW of electricity. The project period is about 5 years. He also informed that some part of Sindhuli Road comes under inundation permanently after construction of this Project.

   Mr. Sushil Acharya, the Project Director of Sunkosi-Marin Diversion Project, explained general information of the project including technical aspects and the implementing schedule. He also explained about the part of the Sindhuli Road that comes under effect near the proposed diversion headworks as summarized below.

   - 425 m highway length U/S of Khurkot has to be used for structures construction and 475 m will be in inundation considering pond level 474 m and FB of 2m.
   - Considering steep topography at the site the highway has to be shifted from Bhalu Khola Bridge up to 2 km U/S stretch of highway
   - Because of non-availability of suitable camp site nearby to headworks, 2 km highway has to be used for construction services.
   - Highway realignment is expected to start tentatively after two years
   - Because of special design features of highway, SMDMP is expecting detail design as well as construction of realigned highway from DOR

4. Mr. Krishna Singh Basnet, the Executive Director of Roads Board Nepal (hereinafter referred as "RBN") addressed to the meeting, highlighting Development Policy of Toll Road System in Nepal. In his presentation he briefly explained about trend of transport development in Nepal, the importance of road maintenance and role of Road Boards Nepal (RBN). He also highlighted the present status of toll practices being adopted in Nepal and future programs. Finally, he requested JICA to support RBN in various aspects of toll collection.

5. Mr. Surya B. Bhat, the Project Manager of Sindhuli Road Project, presented in brief Annual Road

Maintenance Plan of Sindhuli Road for Fiscal Year FY 2019-20. He also showed total budget allocated under different headings and activities to execute for that period. Also highlighted the concept of development actions that need to be taken in the future.

6. Mr. H Shinkai, the Chief Advisor of JICA Expert Team briefly presented

   (1) Indicator of the Project Goal in PDM. He proposed one new objectively verifiable indicator as Accident Ratio (number of traffic accident per vehicle-km) for the year of 2015 (instead of Fatality Ratio (number of fatality accident per vehicle-km) for the year of 2011) in all Sections reduces by 30% by 2023.

   (2) Work Plan which was revised to reflect project related new activities, early transfer of EIS to DOR HQ and revised implementing schedule of the pilot project.

   (3) Technical Training in Japan with request C/P agencies to finalize participants name officially by 30th September 2019.

7. Mr. H. Fujisawa, the JICA Expert, presented Preliminary Evaluation and Design of the Pilot Project in relation to various aspects including topographical survey, geological survey of the candidate causeway sites, hydrological Study and hydraulics study for horizontal and vertical clearance of the Pilot Project bridge design including debris flow phenomenon, debris flow estimation, verification of length of bridges, score depth for foundation design etc. Finally, conceptional design of the Pilot Project, comparison and determination of the bridge type, implementation structure and schedule are presented.

8. Mr. B. Yadav and Mr. B. Timilsina from DWRI presented general approaches of river training works of pilot projects. Some alternatives of training works are proposed in the presentation.

9. Mr. Bindu S. Rana presented with brief explanation to the Result of Traffic Safety Survey and Traffic Accident Analyses of Sindhuli Road for last few years. He highlighted the necessity of road safety campaign, road safety countermeasures with some recommendations to follow.

10. Mr. M. Iwamaru presented about Road Improvement Plan of the Sindhuli Road. In his presentation, he briefly explained about the necessity of improvement Sindhuli Road with approaches and steps to be implemented in future.

11. Mr. K. Narita of JICA Expert Team and Mr. S. B. Prajapati of Roads Board Nepal jointly presented Pre-FS of the Rest Area and the Toll System to be introduced in the Sindhuli Road. Mr. Narita explained about the necessity of Rest Area along Sindhuli Road. Mr. Prajapati explained about overview, current situation and future plan of toll system to be set up at Sindhuli Road.

12. Dr. Akhilesh K. Karna presented the Proposal for Improvement of EIS and additional infrastructures. In his presentation, he briefly explained about role of information system, concept of emergency system, transferring of EIS to DOR, O&M of EIS and additional EIS infrastructures proposed and tentative cost required.

13. Discussion

    Mr. Bindu S. Rana notified to the meeting that based on the accident's records collected, high speed is identified as one of the major causes of increasing number of accidents. To discourage high speed, it is necessary to introduce traffic calming such as rumble strip to accident black spot locations as a trial site. DDG Mr. Thapa responded that the road safety could be improved by better geometry, introducing additional lanes, replacing bridges with wide pavement width and awareness among road users as well as agree to installed rumble strip as a trial site in Sindhuli Road.

    Mr. Tatsuhito Kondo of JICA Nepal Office stressed the fact SMDMP is not yet agreed by JICA and further needs of clarification of the detail. And He also emphasized DWRI have to have close discussion with DOR for better operation/ maintenance of Sindhuli Road. Also requested for sharing

the latest information with JICA. Mr. Sushil Acharya assured that necessary sharing of information and involvement of DOR, being as competent in road related activities, will be followed. Regarding Pilot project, Mr. Kondo clarified that the purpose of Pilot Project is to transfer technology which includes technical knowledge and philosophy.

Mr. Kota Tsuda of JICA HQ spoke the importance of soft components. He further said that the lessons learned from Sindhuli Road could be used to other roads also. He also suggested to the training participants for preparing one-page summary notes about the current issues and challenges which could be helpful in preparing action plan and presentation during training in Japan.

14. Closing Remarks

Mr. Arjun Jung Thapa, the Project Director, DDG and the Chairperson of the Meeting, in his closing remarks he mentioned the following points

- requested DWRI for sending formal letter about the proposed SMDMP. DOR would extend their expertise for shifting and designing of the Sindhuli Highway part that will come under inundation permanently
- Road asset management plan proposed by RBN is good. The fund raised by proposed toll system at Sindhuli Road will be used for the maintenance of the same road. This policy will be followed.
- Let the design of Pilot Project presently being prepared by the JICA Expert Team be shared in manual-form so that the design manual could be replicated as technology transfer for other projects of similar conditions. This matter we had discussed earlier also and today I am repeating again.
- The maintenance work presently undertaken by the Sindhuli Road Project including widening of Sindhuli Road will be continued. The fund raised by RBN through toll will be used for this purpose too. JICA Expert Team is requested to extend their support in designing toll system.
- As in SRMU Phase-1, Sight Improvement Works will be continued by DOR. Necessary budget has been allocated for improvement of traffic signs, lay-bys etc.
- The Road Side Service Centre proposed in Nagdhunga Tunnel Project could be replicated at Sindhuli Road after evaluating the performance of the Service Centre on that Project.

Finally, he thanked all participants for their patience for this long discussion program.

After a constructive discussion and having a confirmation of cooperation to implement the Project, the 2nd JCC meeting was closed at 17:00 PM on 26th September 2019.

Arjun Jung Thapa
Deputy Director General, Project Director
Department of Roads

Pradeep Thapa
Deputy Director General
Department of Water Resources and Irrigation

Krishna Singh Basnet
Executive Director
Roads Board Nepal

Kondo Tatsuhito (Mr.)
Representative
JICA Nepal Office
Japan International Cooperation Agency

Hiroki Shinkai
Chief Advisor of the Project
JICA Expert Team
Japan International Cooperation Agency

Page 6

Annex-1 Participants' List

THE PROJECT FOR THE OPERATION AND MAINTENANCE OF THE SINDHULI ROAD PHASE 2

The Project for the Operation and Maintenance of the Sindhuli Road Phase 2

2nd JOINT COORDINATING MEETING

Date 26th September, 2019
Time 13:00 to 16:00
Venue DOR Conference Room

Attendee List - 1

No	Name	Organization	Position	Signature
1	Mr. Arjun Jung Thapa	DOR/DCID	Chairman/ DDG	
2	Mr. Pradeep Thapa	DWRI	DDG	
3	Mr. Krishna Singh Basnet	RBN	Executive Director	
4	Mr. Surya Bahadur Bhat	DOR	PM, SDDSBRP, C/P	
5	Ms. Shila Shrestha	DOR	Engineer, SDDSBRP, C/P	
6	Ms. Binara Dhami	DOR	Engineer, SDDSBRP, C/P	
7	Mr. Birendra Yadav	DWRI	Sr. Divisional Engineer, C/P	
8	Mr. Mukesh Pathak	DWRI	Engineer, C/P	
9	Mr. Basudev Timilsina	DWRI	Sr. Divisional Engineer	
10	Mr. Susheel C. Acharya	DWRI	Project Director of SMDMP	
11	Mr. Sanu Babu Prajapati	RBN	Sr. Engineer, C/P	
12	Ms. Jyotshana Subedi	DOR	Sub-eng., SDDSBRP	
13	Ms. Srijana Lekhak	DOR	Sub-eng., SDDSBRP	
14	Ms. Rasmita Basnet	DOR	Sub-eng., SDDSBRP	
15	Mr. Yoshiki SANDO	Embassy of Japan	Secretary	
16	Ms. Yumiko ASAKUMA	JICA Nepal	Chief Representative	
17	Mr. Takuhiko KONDO	JICA Nepal	Representative	
18	Mr. Kota TSUDA	JICA HQ	Representative	
19	Mr. Hiroyuki TONISHIGE	JICA HQ		
20	Mr. Siddhartha Shrestha	Embassy of Japan	Program Manager	
21	Mr. Sourab Rana	JICA Nepal	Program Officer	
22	Chhabi Lal Gautam	DWRI/DCID	Engineer	
23	Rishik Rajbhandari	DOR/MTD	SDE	
1	Mr. Hiroki SHINKAI	JICA Expert	Chief Advisor	
2	Mr. Masaki IWAMARU	JICA Expert	Deputy Chief Advisor	
3	Mr. Hiroshi FUJISAWA	JICA Expert	Road Structure Planner	
4	Mr. Bindu S. RANA	JICA Expert	Traffic Safety Measures	
5	Mr. Izumi MIDORIKAWA	JICA Expert	Pavement Quality Control	
6	Mr. Khadananda LAMSAL	JICA Expert	Hydrologic Analysis	
7	Mr. Ramesh P. KOIRALA	JICA Expert	Road Structural Design	
8	Mr. Akhilesh K. KARNA	JICA Expert	Road Disaster Prevention	
9	Mr. Kiyoshi NARITA	JICA Expert	Toll Road System	
10	Mr. Keita IRIND	JICA Expert	Coordination/ Procurement	
11	Mr. Hikaru TANAKA	JICA Expert	Road Specialist	
12	Mr. Sekar Adhikari	SROM2	Road Pavement Maintenance	
13	Ms. Poshin Amatya	SROM2	Structure Design Assistant	
14	Mr. Santosh Rai	SROM2	Secretary	
15	Mr. Rajendra Shrestha	SROM2	Computer Operator	
16	Ms. Apeksha Purja Magar	SROM2	Assistant	
17	Ms. Bidhya S. Maharjan	SROM2	Assistant	

Page 7

The Photographs

Photo 1. Program Banner

Photo 2. Welcome by DDG, DOR, Mr. A. J. Thapa

Photo 3. Photo Self Introduction

Photo 4. Address by Distinguished Guests - Chief Rep. JICA Nepal Off

Photo 5. Address by DDG, DWRI

Photo 6. Address by Rep. DWRI

Photo 7. Address by Executive Director RBN

Photo 8. Address by the Project Manager, Sindhuli Road

Photo 9. Presentation by JICA Expert Team Member

Photo 10. Presentation by JICA Expert Team Member

Photo 13. Address by the Counterpart, DWRI

Photo 14. Presentation by JICA Expert Team Member

Photo 15. Presentation by JICA Expert Team Member

Photo 16. Presentation by JICA Expert Team Member

Photo 17.Presentation by JICA Expert Team Member

Photo 18. Presentation by JICA Expert Team Member

Photo 19. Presentation by JICA Expert Team Member

Photo 20. Presentation

Photo 21.Closing Remarks by Chairperson

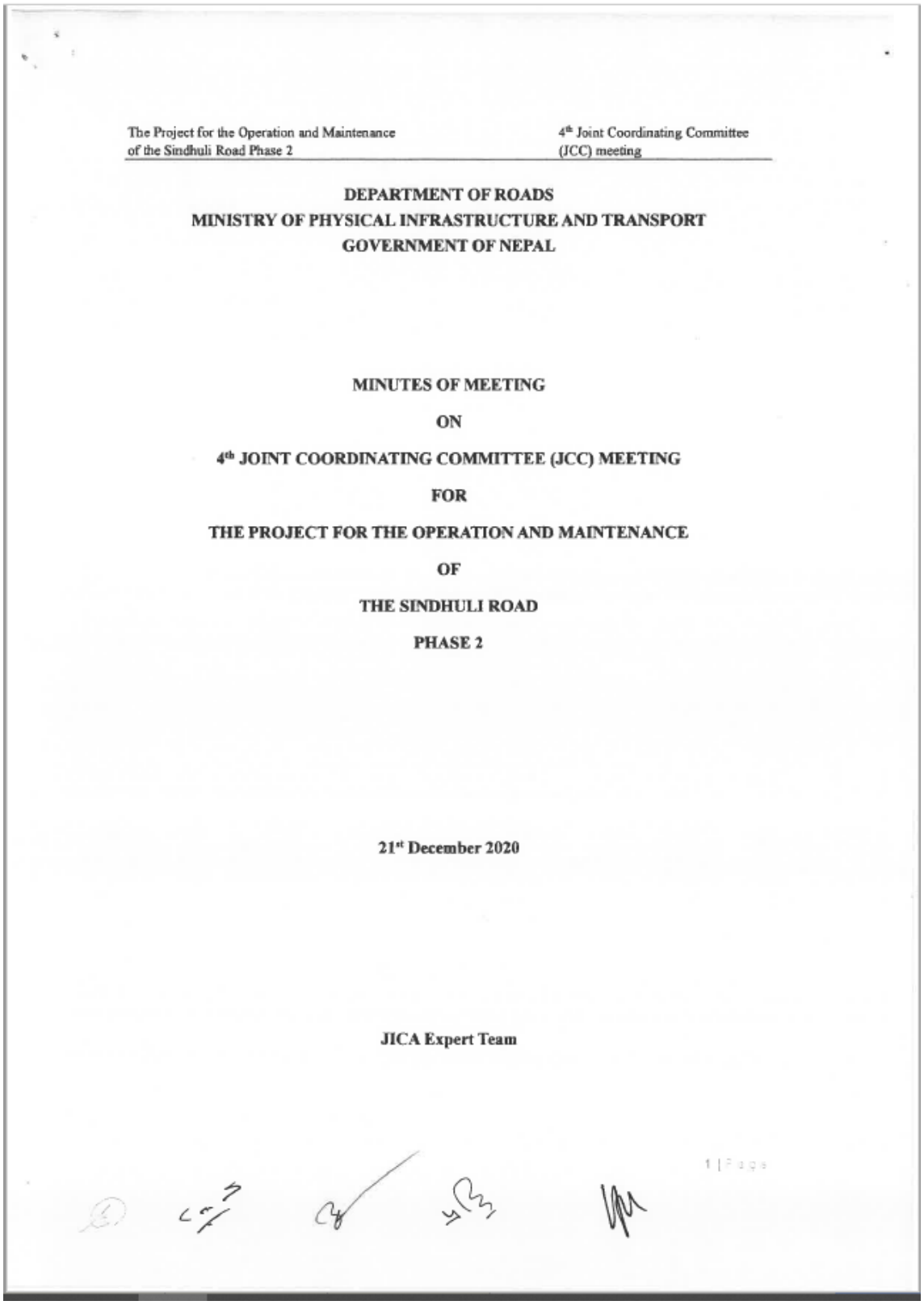
Photo 22. Closing by Chair Person

Page 9

Minutes of 3rd JCC

3rd JCC meeting was cancelled due to spread of COVID-19.

Minutes of 4th JCC



DEPARTMENT OF ROADS
MINISTRY OF PHYSICAL INFRASTRUCTURE AND TRANSPORT
GOVERNMENT OF NEPAL

MINUTES OF MEETING
ON
4th JOINT COORDINATING COMMITTEE (JCC) MEETING
FOR
THE PROJECT FOR THE OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD
PHASE 2

21st December 2020

JICA Expert Team

MINUTES OF MEETING
ON
4th JOINT COORDINATION COMMITTEE MEETING
FOR
THE PROJECT FOR THE OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD PHASE 2

Date & Time : 21st December 2020, 10:30– 13:30 hrs. (NST), 13:45– 16:45 hrs. (JST)
Place of Meeting : Zoom Meeting (Webinar)
Participants : See attached participants list (Annex 1)

A. Agenda:

1. Mr. Arjun Jung Thapa, DDG, DOR
   Opening of 4th Joint Coordinating Committee
2. Mr. Surya B. Bhat, Project Manager of the Sindhuli Road, DOR
   Allocation Plan of GON and RBN Budgets (FY2020/2021),
   Implementation Policy of the Pilot Project and its Schedule,
   Other works including Pavement Overlay, EIS, etc.
3. Mr. H. Shinkai, Chief Advisor, JICA Expert
   Proposed Revised Work Plan of SROM2
4. Mr. H. Fujisawa, JICA Expert
   Final Drawing of 3 Bridges of Pilot Project
   Manual of "RC Continuous Slab Bridge" and Schedule of OJT
5. Question & Answer
6. Mr. B. S. Rana, JICA Expert
   Schedule of Traffic Survey & Traffic Safety Education Plan
7. Mr. M. Iwamaru, JICA Expert
   Outline of Proposed Partial Widening Plan of Sec. IV
8. Ms. Gitanjali Koirala, DOR and Mr. A.K. Karna JICA Expert
   OM of EIS and Additional Provision of RIB at Khurkot
9. Mr. Sano Babu Prajapati, C/P from RBN & Mr. Narita, JICA Expert
   Introduction of Hybrid ETC
10. Question & Answer
11. Mr. Pradeep Thapa, DDG, DWRI
    Remarks
12. Mr. Sushil Babu Dhakal, Executive Director, RBN
    Remarks
13. Ms. Yumiko Asakuma, Chief Representative, JICA Nepal
    Remarks
14. Mr. Arjun Jung Thapa, Project Director and DDG, DOR
    Closing Remarks

B. Proceedings and Discussions

Following with the Record of Discussions (hereinafter referred to as "R/D") for the Project of the Operation and Maintenance of the Project Phase 2 (hereinafter referred to as the "Project" or "SROM2"), the Department of Roads (hereinafter referred to as the "DOR") held the Fourth (4th) the Joint Coordinating Committee Meeting (hereinafter referred to as JCC) Meeting to discuss and approve the various agenda (mentioned above) of the Project on 21st December 2020. The meeting was held on Zoom. The participants took part in the meeting from their respective institutions.

The proceedings of the 4th JCC Meeting have been presented below.

1. An introduction of each participant along with their organization was made by the facilitator at the beginning.

2. Some ground rules set for the online zoom meeting were announced.

3. Opening Remarks by the Chairperson Mr. Arjun Jung Thapa, the Deputy Director-General, Development Cooperation Implementation Division and the Project Director of SROM2, DOR

   In his opening remarks, Mr. Thapa welcomed all participants and thanked the Government of Japan (GoJ) for supporting the Project. He cited the cooperation of JICA to Sindhuli Road at different stages and thanked them for the supports. The Road has played a milestone to the socio-economic sector and easy access to the people residing in this area as well as other nearby districts and eastern Terai part. He furthered highlighted the role of SROM2 which has been going on at present which is supported by JICA as technical assistance. He mentioned the program of the proposed three bridges. The government of Nepal (hereinafter referred to as the "GoN") is availing funds by itself with support on the technical aspects from the JICA Expert Team. Along with their technical supports, the JICA experts will prepare a design manual for slab bridges with mat foundation which have been practiced in Sindhuli Road that can be replicated in many places with similar nature. He further explained the necessity of widening of BP Highways due to the increased traffic volume. He also spoke about the other project activities that are being proposed to be implemented in near future. He explained the effect of the COVID-19 pandemic on the development activities in Nepal. He expected the discussion in this meeting will bring a fruitful conclusion.

4. Mr. Surya B. Bhat, the Project Manager of Sindhuli Road Project, presented in brief about the Progress Report of RBN, GoN Budget & JICA Grant Project. The outline of his presentation was comprising of Project Office Background, Allocation Plan of GoN and RBN Budget for FY 2020/2021, Progress of Major works under RBN, Progress of GoN Budget, Implementation Schedule of Pilot Project, other works including Pavement Overlay and Emergency Implementation System (EIS). He presented and explained in brief about the activities that are planned and presently ongoing and the respective budgets allocated. He also explained the proposed implementation plan of three bridges of Pilot Project, viz. Mamti, Bhyakure, and Ghyampe, as shown in Annex 2 attached herewith. He proposed the implementation schedule of 18 months for Mamti Bridge and 24 months for

Bhyakure and Ghyampe Bridges respectively, starting after the cessation monsoon season of 2021. He proposed the shifting of EIS work to DOR (TESU) because the experts of EIS not available in the Project Office.

5. Mr. H. Shinkai, the Chief Advisor of the JICA Expert Team presented briefly on the Revised Work Plan of SROM2 due to COVID-19. The Contents of his presentation were Outline of the Project, Project activities affected by COVID-19, and proposed revised work Plan and issues to be at the 4th JCC Meeting. He elaborated on each topic with a little detail as presented below.

   1. Outline of the Project (the Project, Project Site, Duration of the Project, Counterparts of the Project and Management System in the Sindhuli Road, Project Activities based on the Project Design Matrix (PDM), Activities related to each output and initial work Plan of SROM2)
   2. Project Activities affected by COVID-19 and Proposed Revised Plan (Current Status of the Project, Major Project Activities affected by COVID-19, Reasons for an extended period of one year, Proposed Revised Plan) and,
   3. Issues to be Confirmed at the 4th JCC Meeting (Implementation Schedule of Pilot Project, Extension of SROM2, Amendment of Record of Discussions (R/D), and Re-scheduling of JCC Meeting.

6. Mr. H. Fujisawa, the JICA Expert, presented on the topic RC Continuous Slab Bridge Manual Schedule. In the beginning, he explained, in brief, the implementation status of the Pilot Project, current progress of the detailed design with specific reference of design standard and criteria of RC continuous slab bridge. He further explained the contents of RC continuous slab bridge design manual. Finally, he presented the proposed implementation schedule for soft and training components.

7. Mr. Bindu S. Rana presented with a brief explanation about Traffic Accident Analysis and Traffic Safety Education. The Contents in his presentation were (a) Yearly trend of Traffic Volume and Accident (b) Traffic Safety Education and (c) Review of Traffic Safety Master Plan. He presented many illustrations through tables, charts, and graphs to support his observations. He also highlighted the plan for conducting a road safety awareness campaign for the teachers belonging to the districts adjacent to Sindhuli Road.

8. Mr. M. Iwamaru presented the outline of the Preliminary Study for Partial Widening specifically Section IV (Nepalthok to Dhulikhel). He explained in the contents comprising the background and objectives, widening policy and conditions, the possibility of widening, and conclusions and recommendations.

9. Ms. Gitanjali Koirala and Dr. A. K. Karna jointly presented about Operation Maintenance of Emergency Information System (EIS) and Additional Provision of RIB at Khurkot having contents (a) components of EIS, (b) Operation of EIS, (c) Additional EIS introduction and (d) Schedule of addressing EIS issues. They have proposed handing over of EIS to DOR (HMIS) for better-coordinated services.

10. Mr. Sanu Babu Prajapati and Mr. K. Narita jointly presented about the Introduction of Hybrid Electronic Toll Collection (HETC) having contents comprising of (a) Current Status of the Toll Road System, (b) Overview of HETC and (c) Proposed Plans for

Introducing HETC – Draft.

11. Discussion

Mr. Arjun Thapa wants to be clear about the cost-effective length of the RC continuous slab bridge. Mr. Fujisawa clarified his query. Mr. Koirala shared his experience of an artisan problem in Terai Plain. The performance of the bridge is still under observation.

Mr. Thapa wanted to know about the modality of JICA Experts role during the construction supervision period. Mr. Fujisawa responded. Mr. Thapa expects support from JICA Experts in technical matters for three bridges.

Ms. A. Nakamura of the JICA Nepal Office questioned how the DOR and Consultant are taking action to avoid infection of COVID-19 and what are the countermeasures taken under the Project because the safety of people is very important. Mr. Thapa responded to this question. GoN is maintaining the protocol and following the protocol prepared by WHO. Maintaining Social distance and use of PPEs, sanitizer, etc.

Mr. Y. Yoshida of JICA Headquarter, Tokyo, said this is helpful to know the project situation and further suggested to write the sentence of mitigation measures of COVID-19 to the JCC minutes if possible. Mr. Iwamaru said we have no objection to writing strictly follow mitigation measures of COVID-19 in the minutes.

12. Mr. Pradeep Thapa, JCC Member representing Department of Water Resources and Irrigation (hereinafter referred to as "DWRI)) said in his remarks that the proposed revised schedule is alright to DWRI also. Traffic-related presentation of Mr. Rana is very much informative and other presentations are also fruitful. River training programs in BP Highway area under DWRI are presently running at many places this year and necessary programs will be continued in upcoming fiscal years. He assured DWRI's effort to avail enough budget allocation based on timely discussion with the Project.

13. Mr. Sushil Babu Dhakal, the Executive Director of Roads Board Nepal (hereinafter referred to as "RBN") addressed the meeting highlighting the activities of RBN especially providing resources for Roads maintenance. Source of the fund for RBN is from toll collection and allocation from Ministry of Finance as part of fuel levies, vehicle registration fees, etc. Since Sindhuli Road is listed as National Highway, we are providing maintenance funds for this road also with a trend of increasing budget. GON has decided the Sindhuli Road as Toll Road in 2019 and there are four sections for this purpose. Due to the effect of COVID-19, the collection of tolls has been suspended. Hybrid ETC is going to be replaced to the traditional type of toll collection system and RBN is planning to install HETC as a pilot project in technical support of JICA Experts. He explained the status of two bids for two locations of this highway. Finally, he mentioned the challenges RBN facing at present.

14. Remarks by Chief Representative, JICA Nepal Office

Ms. Yumiko Asakuma, the Chief Representative of the JICA Nepal office addressed the meeting and expressed her happiness for attending this 4th JCC meeting of SROM2. Despite the obstacle created by the COVID-19 Pandemic, she thanked the DOR and the Project team for organizing the JCC Meeting. This is the forum to review the progress of

the Project and provide guidance and support. Sindhuli Road has been a cornerstone of JICA's operation to Nepal linking eastern Terai to Kathmandu passing in efficient and timely travel to the passengers. While crossing typical Nepali land like mountains, valleys, and riverside, Sindhuli Road has many challenges for maintenance and preventing disaster. To keep it in good condition and safe, the DOR needs to manage operation and maintenance efficiently. The experience of DWRI and DOR for disaster prevention is very important. To complement the DOR and as well as DWRI efforts, JICA has been supporting through its technical cooperation projects for maintaining safe and smooth traffic on Sindhuli Road. She also expressed her belief of smooth traffic reduces global warming which causes various kinds of disasters in Nepal as well as in the world. The introduction of toll which is a basis for the financial sustainability of the road maintenance is very important and thanked RBN for supporting the Project. She also believed that this road has played a vital road in building the capacity of related officials from DOR, DWRI as well as the RBN in their respective areas of responsibility while enduring safe, reliable, and environment friendly Sindhuli Road. She assured the continuous support in the days ahead. She emphasized the Project should be Safety First and strongly requested to take countermeasures against COVID-19 during the implementation. Finally, she thanked for participating in today's JCC meeting and wished all success.

15. Closing Remarks

Mr. Arjun Jung Thapa, the Project Director, DDG and the Chairperson of the Meeting, in his closing remarks he mentioned the following points.

- He thanked GON for putting this road as important and allocating a sizable budget for maintenance of this road.
- Activities have been significantly refrained and restricted in the project due to the COVID-19 pandemic and they are not fulfilled as planned. We will try to implement those activities within this fiscal year.
- He thanked JICA Expert Team for designing and providing the design of three bridges. The construction of these bridges will start in the next fiscal year, July 2021, and will be completed in two years as shown in Annex 2 "Implementation Plan of the Pilot Projects" which has been approved by this JCC Meeting.
- Revised schedule of SROM2 proposed by Mr. Shinkai is alright for us.
- Thanked DWRI for their implementation of works at five locations of BP Highway and hoped their support in this road will be continued in the future also.
- Thanked RBN for supporting us for maintaining BP Highway by providing an adequate budget for maintenance.
- Thanked JICA Expert Team for providing Pavement Expert for the overlay works.
- Thanked JICA Expert Team especially Mr. Rana for the training program, now shifted to February 2021 due to the pandemic.
- Thanked Mr. Shinkai for his effort and works for the last 35 years. We are proud of you.

Finally, he thanked all participants for their patience for this long discussion program.

After a constructive discussion and having a confirmation of cooperation to implement the Project, the 4th JCC meeting was closed at 13:30 PM (NST) on 21st December 2020 with the decisions made as presented hereunder.

C. Decisions

1. Implementation of the Pilot Project

As DOR agreed to construct three (3) bridges, namely Mamti, Bhyakure and Ghyampe, as Pilot Project at the cost of DOR as per the Minutes of Meeting on August 28, 2019. DOR will implement three (3) bridges, however, due to the budget constrain caused by COVID-19, DOR decided to implement the procurement of contractor including the mobilization for three (3) bridges based on the available budget for FY2020/21. Actual construction will start at the end of rainy season in 2021after securing the budget of FY2021/22.

Construction of the three (3) bridges shall be executed in accordance with the implementation plan approved by the 4th JCC Meeting. (See Annex 2)

DOR is required to make efforts to develop maintenance and management capacity under their own initiative in cooperation with JICA and JICA Expert Team by utilizing this opportunity.

2. Extension of the Period of SROM2

Both parties agreed to extend the period of SROM2 under the following condition in consideration with the delay of the activities listed in Project Design Matrix (PDM) caused by COVID-19:

(1) The extension of the period of SROM2 will be provided until the completion of Mamti Bridge, assuming that the construction of Mamti will be completed at the end of December 2022. There is a possibility that Technical Assistance will not be extended beyond the one year in principle.

(2) The Technical Assistance for the Pilot Project, including advisory services for procurement and construction supervision as well as training components such as preparation of design manual, typical drawings and training for users of manual, which were agreed by both parties on the Minutes of Meeting signed on August 28 2019, will be provided by JICA as it is during the extended project period of SROM2.

(3) The activities listed in PDM of SROM2 will cover not only for three (3) bridges of pilot projects but also for other activities such as introduction of toll road system, operation of EIS, quality control of pavement and traffic safety measures during the extended period of the project. Both parties will continue to discuss this issue before the next JCC meeting.

3. Amendment of Record of Discussions (R/D) Due to the Extension of Project Period

Both parties deemed necessary to extend the project period of the SROM2 due to the reasons described 2 above and also agreed that Record of Discussions (R/D) should be amended after obtaining an internal approval in DOR and JICA regarding the extension of the project period.

4. Rescheduling of JCC Meeting due to Extension of Project Period of SROM2

Both parties agreed to change the future schedule of JCC Meeting since it is planned to extend the project period of SROM2. Provided that the project period is extended about one (1) year, the expected timeline is as follows:

JCC Meeting	Original Schedule	Revised Schedule (tentative)
1st JCC Meeting	April 2019	Completed as planned
2nd JCC Meeting	September 2019	Completed as planned
3rd JCC Meeting	March 2020	Cancelled due to COVID19
4th JCC Meeting	September 2020	December 2020
5th JCC Meeting	March 2021	June 2021
6th JCC Meeting	August 2021	December 2021
7th JCC Meeting	January 2022	June 2022
8th JCC Meeting	-	December 2022
Completion Report	February 2022	February 2023

5. Mitigation Measures against the COVID-19 for the Project Activity of SROM2

Both parties confirmed that in order to mitigate the effect of COVID-19 Pandemic, every protocol issued to the public by GoN, such as wearing mask, taking temperature and keeping social distance, shall strictly be followed accordingly through the Project's activities.

End

Arjun Jung Thapa
Deputy Director General (DCID)
Project Director
Department of Roads

Pradeep Thapa
Deputy Director General
Department of Water Resources and Irrigation

Sushil Babu Dhakal
Executive Director
Roads Board Nepal

Yumiko Asakuma (Ms.)
Chief Representative
JICA Nepal Office
Japan International Cooperation Agency

Hiroki Shinkai
Chief Advisor of the Project
JICA Expert Team
Japan International Cooperation Agency

Annex 1 Participants' List

Institution	Name	Designation	Email Address
Department of Roads (DOR), Development, Cooperation Implementation Division (DCID)	Mr. Arjun Jung Thapa	DDG and the Project Director (Chairperson)	[redacted]
	Mr. Ashish Thapa Magar	Senior Divisional Engineer	
	Mr. Chhabi Paudel	Engineer	
DOR, Sindhuli Road Project	Mr. Surya Bahadur Bhat	Project Manager	
	Ms. Gitanjali Koirala	Engineer	
Department of Water Resources and Irrigation DWRI	Mr. Pradeep Thapa	Deputy Director General	
	Mr. Birendra Yadav	Senior Divisional Engineer	
	Mr. Mukesh Pathak	Engineer	
Road Boards Nepal, RBN	Mr. Sushil Babu Dhakal	Executive Director	
	Mr. Sanu Babu Prajapati	Senior Engineer	
Embassy of Japan, EOJ	Mr. Yoshiki Sando	Secretary	
JICA Nepal Office	Ms. Yumiko Asakuma	Chief Representative	
	Mr. Kentaro Yokota	Senior Representative	
	Ms. Ayuko Nakamura	Representative	
	Mr. Sourab Rana	Sr. Programme Manager	
JICA Headquarters	Mr. Yuki Yoshida	Officer	
JICA Expert Team, Sindhuli Road Oper. & Maint. Project Phase-2 SROM2	Mr. Hiroki Shinkai	Chief Adviser	
	Mr. Motoki Iwamaru	Deputy Chief Advisor / Road O/M Planner	
	Mr. Hiroshi Fujisawa	Road Structural Planner	
	Mr. Bindu S. Rana	Traffic Safety / Traffic Education / Project Coordinator	
	Mr. Izumi Midorikawa	Pavement Quality Control	
	Mr. Ramesh P. Koirala	Road Structural Design (Causeway)	
	Mr. Akhilesh K. Karna	Road Disaster Prevention / EIS	
	Mr. Kiyoshi Narita	Toll Road System	
	Ms. Natsuko Sagawa	Coordinator	
	Mr. Santosh Rai	Secretary, Nippon Koei KTM Office	

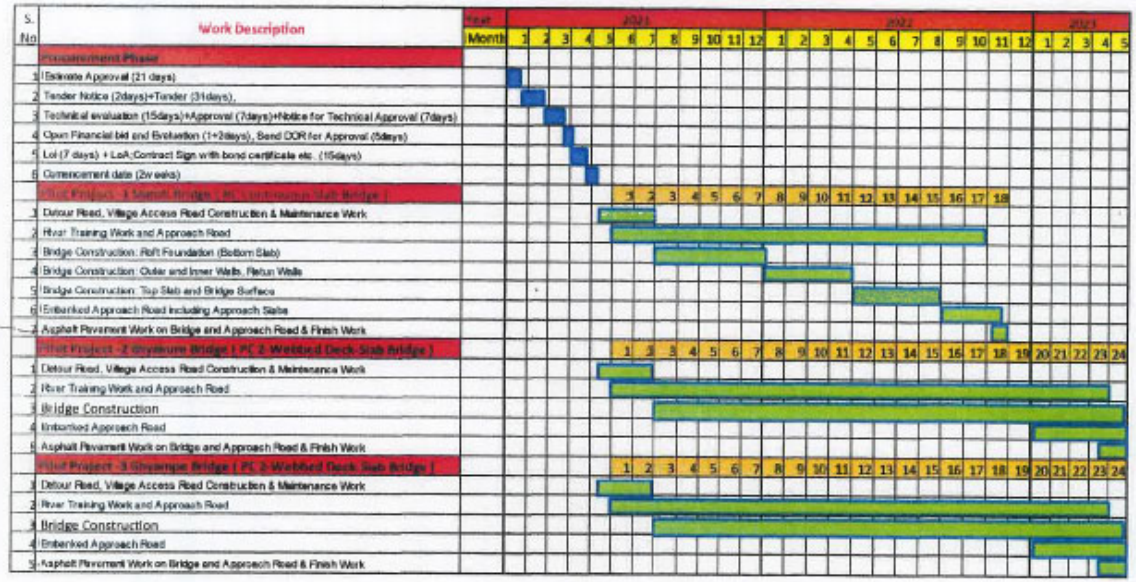
The Project for the Operation and Maintenance of the Sindhuli Road Phase 2

4th Joint Coordinating Committee (JCC) meeting

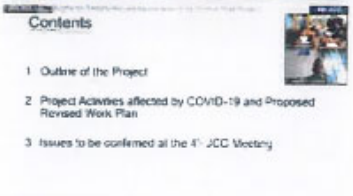
Annex 2: Proposed Implementation Plan of the Pilot Project approved by 4th JCC Meeting

Proposed Implementation Schedule of the Mamti; Bhyakure and Ghyampe Bridges Construction

The Pilot Project Name: Construction of Three Bridges (Ghyampe, Mamti and Bhyakure) located between Ch.111+400 to Ch.119+700 section of BP Highway



The Photographs



Minutes of 5th JCC

DEPARTMENT OF ROADS
MINISTRY OF PHYSICAL INFRASTRUCTURE AND TRANSPORT
GOVERNMENT OF NEPAL

MINUTES OF MEETING
ON
5th JOINT COORDINATING COMMITTEE (JCC) MEETING
FOR
THE PROJECT FOR THE OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD
PHASE 2

30th July 2021

JICA Expert Team

MINUTES OF MEETING
ON
5th JOINT COORDINATION COMMITTEE MEETING
FOR
THE PROJECT FOR THE OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD PHASE 2

Date & Time : 30th July 2021, 10:30– 13:30 hrs. (NST), 13:45– 16:45 hrs. (JST)
Place of Meeting : Zoom Meeting (Webinar)
Participants : See attached participants list (***Annex I***)

A. Agenda:

1. Mr. Ram Hari Pokharel, Project Director and DDG, DOR
   Opening of 5th JCC Meeting, Opening Speech
2. Mr. H. Shinkai, Chief Advisor, JICA Expert
   Historical Background of the Sindhuli Road
   Progress, current issues and future plans of the SROM 2 Project
3. Mr. Rabindra Lal Das, Project Manager of the Sindhuli Road, DOR
   Results of maintenance work in last fiscal year FY2020/21
   New year budget for GON and RBN (FY 2021/22)
   Tender results of the Pilot Project
4. Mr. R. P. Koirala & Mr. H. Fujisawa, JICA Experts
   Bridge design and river training of the pilot project
   Important note related to the implementation of the pilot project
5. Question & Answer
6. Mr. B. S. Rana, JICA Expert
   Traffic survey, traffic accident analysis and traffic safety education
7. Mr. M. Iwamaru & Mr. I. Midorikawa, JICA Experts
   Partial widening plan, pavement overlay work and technical training
8. Mr. A. K. Karna JICA Expert
   Current issues and future management of EIS
9. Mr. K. Narita, JICA Expert & Mr. S. B. Prajapati, Senior Engineer, RBN
   Current toll system and implementation plan of Hybrid ETC
10. Ms. N. Sagawa, JICA Expert
    Project progress monitoring
11. Question & Answer
12. Mr. Pradeep Thapa, DDG, DWRI
    Remarks
13. Mr. Sagar Gyawali, Acting Executive Director, RBN
    Remarks
14. Ms. Yumiko Asakuma, Chief Representative, JICA Nepal Office
    Remarks
15. Mr. Ram Hari Pokharel, Project Director and DDG, DOR
    Closing Remarks

B. Proceedings and Discussions

Following with the Record of Discussions (hereinafter referred to as "R/D") for the Project of the Operation and Maintenance of the Project Phase 2 (hereinafter referred to as the "Project" or "SROM2"), the Department of Roads (hereinafter referred to as the "DOR") held the Fifth (5th) the Joint Coordinating Committee (hereinafter referred to as "JCC") Meeting to discuss and approve the various agenda (mentioned above) of the Project on 30th July 2021. The meeting was held on Zoom. The participants took part in the meeting from their respective institutions.

The proceedings of the 5th JCC Meeting have been presented below.

1. An introduction of each participant along with their organization was made by the facilitator at the beginning.

2. Some ground rules set for the online zoom meeting were announced.

3. Opening Remarks by the Chairperson Mr. Ram Hari Pokharel, the Deputy Director-General, Development Cooperation Implementation Division and the Project Director of SROM2, DOR

   In his opening remarks, Mr. Pokharel expressed his immense pleasure to welcome all participants of the JCC-5 Meeting of SROM2. He also thanked the Government of Japan (GOJ) for supporting the Project. He cited the cooperation of JICA on Sindhuli Road at different stages of development of the Sindhuli Road. The Road has played a vital role in the socio-economic development of Nepal by linking the shortest route between the capital city Kathmandu and eastern terai and adjacent hilly districts. The program for constructing three motorable bridges with double lane standards will be started in this fiscal year. The bid evaluation process is presently going on. He also recalled some activities conducted last year especially, some training programs including of Asphalt Concrete with the support from JICA which were very fruitful. He has requested to continue such programs in this fiscal year too. He expects continued support from the JICA Expert Team in preparing a design manual for slab bridges with mat foundations which have been intensively used in the Sindhuli Road Project. He also requested JICA and GOJ to prepare the Detailed Project Report (DPR) of improvement of this road up to at least double lane standard to accommodate future road traffic. He has also requested JICA and GOJ to assist in preparing the DPR of Khurkot - Chiyabari Tunnel Road. He hopes that the outcome of this JCC Meeting will be fruitful in increasing the relationship between Nepal and Japan.

4. Mr. H. Shinkai, the Chief Advisor of JICA Expert Team, presented his presentation outlined in two part

   Part 1- historical background of Sindhuli Road Project

   In his presentation, he explained about the development stages of the Sindhuli Road Project including Feasibility Study (F/S), Detailed Design and Construction and Technical Support for Operation and Maintenance. He briefly elaborated about the design review of F/S for cost reduction in order to realize the project under the enforcement of Japanese Grant Aid. He mentioned the background of the concept of the cost reduction decided in 1992 with the decisions of (a) Reduced from two-lane road to 1.5 lane road, (b) Change from asphalt road

to gravel road, (c) Changing of 22 of 37 bridges to the causeway and (d) Change Concrete retaining wall to Gabion retaining wall as much as possible. He also explained in brief about the long construction sequence of the Project. Due to the cost reduction measures taken to realize the Project, he highlighted the necessity of strengthening the road maintenance ability of DOR after opening of Sindhuli Road.

Part 2 - Progress and Current Issues of the SROM 2

SROM-1 (2012-2015) and SROM-2 (2019-2023) have been taken up under the JICA Technical Cooperation Program as a part of strengthening of the road maintenance ability of DOR after opening of Sindhuli Road. Mr. Shinkai elucidated the necessity of SROM 2 considering the rapid increase in traffic volume after opening the entire stretch of Sindhuli Road with many consequences including increase in traffic accidents, pavement damage, traffic interruption at causeway sites, shortage of funds, need for improving the Emergency Implementation System (EIS), traffic education etc. He also explained about the Project Design Matrix (PDM) with its overall goal, purpose and expected outputs as stipulated in the Record of Discussion (R/D). Mr. Shinkai also highlighted some of the specific issues to be implemented during the remaining period of SROM-2 that are (1) Reconstruction of damaged pavement (Dhulikhel to Kavrebhanjyang, about 5 km), (2) Sediment outflow countermeasures at Khaldhunga of Section IV, (3) Partial widening of Section IV based on report prepared by SROM-2, (4) Support for introduction of HETC and (5) Transfer the operation and management of EIS to DOR Headquarter. Finally, he summarized the important assumption for SROM-2 to complete on time which are (1) The Construction of pilot project should not be delayed due to abnormal rainfall, etc., (2) Prohibition order due to COVID-19 will not be issued again for a long period of time, and (3) the road detour work required by the Sunkosi Marin Water Diversion Tunnel construction will not affect the maintenance activities of the Sindhuli Road.

5. Mr. Rabindra Lal Das, the Project Manager of Sindhuli Road Project, made his presentation on various topics comprising of (a) Results of maintenance work in last fiscal year FY 2020/21, (b) New year budget for GON and Roads Board Nepal (RBN) of FY 2021/22 and (c) Tender results of the Pilot Project.

   The outline of his presentation was comprising of Project Office Background, Allocation Plan of GoN and RBN Budget for FY 2021/2022, Progress of Major works under RBN, Progress of GoN Budget, Implementation Schedule of Pilot Project, other works including Pavement Overlay and EIS and some burning issues. He presented and explained in brief about the activities that are planned and presently ongoing and the respective budgets allocated. He also explained the proposed implementation plan of three bridges of the Pilot Project, viz. Mamti, Bhyakure, and Ghyampe, as shown in ***Annex 2*** attached herewith. He proposed the implementation schedule of 18 months for Mamti Bridge and 24 months for Bhyakure and Ghyampe Bridges respectively, starting after the end of the ongoing monsoon season of 2021, probably from the end of September 2021.

6. Mr. Ramesh P. Koirala presented on the topics (a) Bridge design and river training of the pilot project and (b) Important notes related to the implementation of the pilot project. In their presentation, the presenter explained about the reasons for adopting causeways on Sindhuli Road, their necessity of replacement by bridges (the three bridges, Ghyampe, Mamti and

Bhyakure Bridges under the pilot project), the design criteria adopted, finalization of the type and size of bridges, their estimated costs and status of the implementation schedule. The presenter also explained about the considerations required for implementation of the pilot project including IEE, importance for temporary facilities and method of technical assistance from JICA experts.

7. Mr. Bindu S. Rana presented with a brief explanation about Traffic Accident Analysis and Traffic Safety Education. The Contents in his presentation were (a) Yearly trend of Traffic Volume (b) Traffic trend accident, (c) Traffic Safety Improvement, (d) Next traffic Survey Plan, and (e) Traffic Safety Education Plan. He presented many illustrations through tables, charts, and graphs to support his observations. He also highlighted the plan for conducting a road safety awareness campaign for the teachers belonging to the districts adjacent to Sindhuli Road.

8. Mr. M. Iwamaru presented the outline of the Preliminary Study for Partial Widening Plan, Pavement Overlay Works and Technical Training. He explained in the contents comprising the (a) Partial Widening Plan (Background and objective, Widening Policy and Conditions and Possibility of Widening), (b) Pavement Overlay Works and (Technical Training). In his presentation, he summarized the following points in conclusion (1) It is desirable to implement road widening works in early stage in consideration of necessity of the first 5 km stretch from Dhulikhel to Patalekhet, (2) In the further design stage, final determination of widening section should be observed in detail, and (3) In point of economical road management for long term, road widening plan and pavement repair plan should be considered in relation to each other without planning individually.

9. Dr. Akhilesh. K. Karna presented about Current Issues and Future Management of EIS. The contents of his presentation were (1) Background, (2) Components of EIS, (3) Current situation, and (4) Future Management of EIS. He further elaborated the present EIS issues and its long-term management. Finally, he proposed a tentative timeline for handing over of EIS.

10. Mr. K. Narita and Mr. Sanu Babu Prajapati jointly presented about the Current Toll System and Implementation Plan of Hybrid ETC (HETC) having contents comprising of (a) Current Status of the Toll Road System, (b) Overview of HETC and (c) Proposed Plans for Introducing HETC – Draft.

11. Ms. Natsuko Sagawa, JICA Expert, presented the Project Progress Monitoring of SROM2. The Contents of her presentation covered (1) Record Progress by using Project Monitoring Sheet, (2) Utilization of Monitoring Sheet, (3) Update Information in the Monitoring Sheet, and (4) Record of Monitoring Sheet (Ver. 1 vs Ver. 5).

12. Discussion

Mr. Ram Hari Pokharel, the DDG wants some clarification about the EIS and RIB. Earlier, after having a discussion with JICA Experts Mr. B. S. Rana and Dr. Akhilesh about a half-day training regarding EIS and RIB proposed in July 2021. But because of the COVID-19 Pandemic, it could not be conducted. Dr. Akhilesh confirmed the postponement and assured that the training will be conducted at an appropriate time once the pandemic becomes practically under control.

13. On behalf of Mr. Pradeep Thapa, JCC Member, Mr. Birendra Kumar Yadav, Senior Divisional Engineer representing Department of Water Resources and Irrigation (hereinafter referred to as "DWRI)) said in his remarks that this is a good opportunity for him to be a part of this meeting. In the last Fiscal Year, DWRI had allocated 20 million Nepali Rupee for protection works in Sindhuli Road, but about only 50% accomplished due to COVID-19 situation. Likewise, this year, about 8 million Nepalese Rupee has been allocated for this Project, that will be used after necessary consultation with the Project official. He wished every success of this meeting.

14. Mr. Sagar Gnawali, the Executive Director of RBN addressing the meeting, thanked JICA Team for supporting in introducing HETC system in Sindhuli Road. Sindhuli Road is listed as National Highway, RBN is collaborating in maintaining the road, especially fully providing for routine maintenance, partially providing for periodic maintenance and some amount for other specific emergency maintenance and road safety tools. During FY 2020-21, NRs. 378 million was allocated for Road Maintenance works (Sindhuli Road). Road users fee collection was introduced after publishing in gazette in March 2019 on two sections of Sindhuli Road. RBN has selected two feasible sections for toll collection facilities and started fee collection manually. He presented the status of toll collection at both of the sections. Due to COVID-19 pandemic, the collection of the road user fee has been stopped till now. RBN at present is working on introducing of Hybrid Electronic Toll Collection System of HETC. This is at bid evaluation process under two contract packages. Being first of this type in Nepal, RBN does not have any experience HETC. More challenges are expected. Valuable feedback from JICA and Nippon KOEI is important to RBN in order to gain confidence for construction and operation of HETC. Mr. Gnawali requested support from developing partners including the JICA for human resources development including technical training and observation tour of similar projects. Finally, he thanked to the organizer of the meeting.

15. Ms. Yumiko Asakuma, the Chief Representative of the JICA Nepal office addressed the meeting and expressed feeling honored for attending this 5th JCC meeting of SROM2. Despite the obstacle created by the COVID-19 Pandemic, she thanked the DOR and the project team in organizing the JCC Meeting. She said that this is the forum to review the progress of the Project and provide guidance and support of the next activities. So, today, she could get to understand the project implementing under current difficult situation. Sindhuli Road has been a cornerstone of JICA's operation to Nepal. It has linked eastern Terai with Kathmandu and has played a very important role. She thanked Mr. Shinkai for the story of Sindhuli Road. She also shared her experience as of a Project Officer working 20 years ago under grant aid cooperation department under the JICA. She was not directly engaged in the Sindhuli Road Project at that period. But the Sindhuli Road Project was a very well-known and famous project of JICA in the world. Now she expressed her happiness for being a member of this project as Chief Representative of JICA in Nepal after 20 years. Sindhuli Road covers typical Nepali terrain of mountains, valleys, along the river, Sindhuli Road has many challenges for maintenance and preventing disaster. To keep it in good condition and safe, the DOR needs to manage its operation and maintenance efficiently. The experience of DWRI and DOR for disaster prevention is very important. To complement the DOR and as well as DWRI efforts, JICA has been supporting through its technical cooperation projects for maintaining safe and smooth traffic on Sindhuli Road. Furthermore, the introduction of toll which is a basis for the financial sustainability for the road maintenance is very important and thanked RBN for

supporting the Project. She also believed that this road has played a vital road in building the capacity of related officials from DOR, DWRI as well as the RBN in their respective areas of responsibility while enduring safe and reliable Sindhuli Road. On the other hand, she mentioned that the infection caused by COVID-19 has not been curbed, making the implementation of the project more difficult. She strongly requested to the DOR and related officials to take utmost care and precautions to protect all people in the Project and implement the Project safely and efficiently. Finally, she thanked for active participation in today's JCC meeting and wished all success.

16 Closing Remarks

Mr. Ram Hari Pokharel, the Project Director, DDG and the Chairperson of the Meeting, in his closing remarks mentioned the following points.

- This is the first experience of JCC meeting to him.
- All eight number of presentations are very good and informative.
- In his opinion, meeting in person would be a more effective than the present on-line meeting.
- Let us hope, the present Covid situation will be improved.
- We have been in contact with JICA and will continue so for all discussions and cooperation.
- Thanked JICA Expert Team, especially Mr. Rana, for providing Pavement Expert for the overlay works and coordinating the training program which was postponed to Februray 2021 due to the pandemic.

Finally, he thanked all participants for their patience for this long discussion program.

After a constructive discussion and having a confirmation of cooperation to implement the Project, the 5th JCC meeting was closed at 13:30 PM (NST) on 30th July 2020 with the decisions made as presented hereunder.

C. Decisions

1. Pilot Project: The construction of pilot project will be started in September 2021 and need to maintain the program schedule as decided. Specific method and scope of technical assistance provided by JICA experts during bridge construction should be well discussed and agreed by both DOR and JICA Expert Team before the start of construction works.
2. EIS: DOR needs to take an action regarding the hand-over of EIS from the Sindhuli Road Office to DOR Headquarters. It is also recommended to organize a short (2-3 hours) workshop among the stakeholders regarding the operation and management of EIS.
3. Traffic Safety: In order to reduce the traffic accidents caused by rapid increase in traffic volume, it is important not only to take hard measures but also to take soft measures through traffic education. Further implementation program should be discussed among counterparts and JICA Expert Team.

4. Partial Widening and Pavement Overlay in Sec. IV: Although the 5km from Dhulikhel to Patalekhet section (Sec. IV) is the entrance to the Sindhuli Road, the pavement is significantly damaged despite the overlay done in few years ago. Upgrading road pavement for this section including partial widening is strongly recommended.
5. HETC: The method and contents of technical support to be provided by JICA experts regarding the introduction of HETC will be discussed by both RBN and JICA Expert Team after the local consultant and HETC developer employed by RBN are selected.

All parties confirmed that in order to mitigate the effect of COVID-19 Pandemic, every protocol issued to the public by GoN, such as wearing mask, taking temperature and keeping social distance, shall strictly be followed accordingly through the Project's activities.

Ram Hari Pokharel
Deputy Director General (DCID)
Project Director
Department of Roads

Pradeep Thapa
Deputy Director General
Department of Water Resources and Irrigation

Sagar Gnawali
Executive Director
Roads Board Nepal

Yumiko Asakuma
Chief Representative
JICA Nepal Office
Japan International Cooperation Agency

Hiroki Shinkai
Chief Advisor of the Project
JICA Expert Team
Japan International Cooperation Agency

End

Annex 1 Participants' List

Institution	Name	Designation	Email Address
Department of Roads (DOR), Development, Cooperation Implementation Division (DCID)	Mr. Ram Hari Pokharel	DDG and the Project Director, SROM2	[redacted]
	Mr. Ashish Thapa Magar	Senior Divisional Engineer	
	Mr. Trilok Ghimire	Engineer	
DOR, Sindhuli Road Project	Mr. Rabindra Lal Das	Project Manager	
	Ms. Gitanjali Koirala	Engineer	
Department of Water Resources and Irrigation (DWRI)	Mr. Pradeep Thapa	Deputy Director General	
	Mr. Birendra Yadav	Senior Divisional Engineer	
	Mr. Mukesh Pathak	Engineer	
Road Boards Nepal, RBN	Mr. Sagar Gnawali	Executive Director	
	Mr. Sano Babu Prajapati	Senior Engineer	
Embassy of Japan, EOJ	Ms. Miyuki Ishida	First Secretary	
JICA Nepal Office	Ms. Yumiko Asakuma	Chief Representative	
	Mr. Yoshiki Ehara	Senior Representative	
	Ms. Ayuko Nakamura	Representative	
	Mr. Sourab Rana	Sr. Programme Manager	
JICA Headquarters	Mr. Yuki Yoshida	Officer	
	Mr. Yuki Ota	Officer	
JICA Expert Team, Sindhuli Road Oper. & Maint. Project Phase-2 SROM2	Mr. Hiroki Shinkai	JICA Expert, Chief Adviser	
	Mr. Motoki Iwamaru	JICA Expert	
	Mr. Hiroshi Fujisawa	JICA Expert	
	Mr. Bindu S. Rana	JICA Expert	
	Mr. Izumi Midorikawa	JICA Expert	
	Mr. Ramesh P Koirala	JICA Expert	
	Mr. Akhilesh K. Karna	JICA Expert	
	Mr. Kiyoshi Narita	JICA Expert	
	Ms. Natsuko Sagawa	JICA Expert	
	Mr. Santosh Rai	NIPPON KOEI KTM Office	

Annex 2: Implementation Schedule of Pilot Project

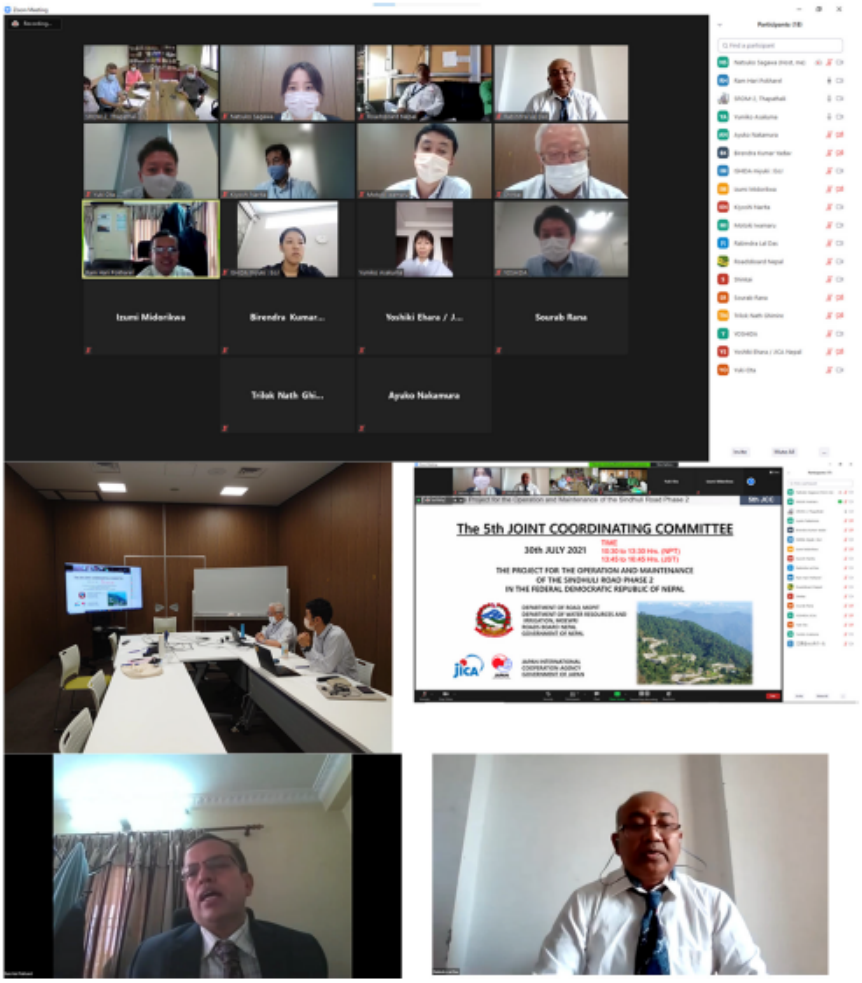
Implementation Schedule of the Pilot Project: Bridges Constructions

The Pilot Project Name: Construction of Three Bridges (Mamti, Ghyampe and Bhyakure)

Locatio : Ch.111+400 to Ch.119+700 section of BP Highway

S. No.	Work Description	Year	2021										2022										2023									
		Month	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9
	Procurement Phase																															
1	Estimate Approval (21 days)																															
2	Tender Notice (2days)+Tender (31days),																															
3	Technical evaluation +Approval +Notice for Technical Approval																															
4	Open Financial bid and Evaluation																															
5	LoI + LoA;Contract Sign w ith bond certificate etc.																															
6	Comencement date (2w eeks)																															
	Pilot Project -1 Mamti Bridge (RC Continuous Slab Bridge)								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18							
1	Detour Road, Access Road Construction & Maintenance Work																															
2	River Training Work and Approach Road																															
3	Bridge Construction: Raft Foundation (Bottom Slab)																															
4	Bridge Construction: Outer and Inner Walls, Retun Walls																															
5	Bridge Construction: Top Slab and Bridge Surface																															
6	Embanked Approach Road including Approach Slabs																															
7	Asphalt Pavement Work on Approach Road & Finish Work																															
	Pilot Project -2 Bhyakure Bridge (PSC 2-Webbed Deck-Slab Bridge)								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	Detour Road, Village Access Road Construction & Maintenance Work																															
2	River Training Work and Approach Road																															
3	Bridge Construction : Open Foundation(footings)																															
4	Bridge Construction: Substructures(Abutments)																															
5	Bridge Construction: Superstructures(PSC girder slab +wearing surface)																															
6	Embanked Approach Road including Approach Slabs																															
7	Asphalt Pavement Work on Bridge and Approach Road & Finish Work																															
	Pilot Project -3 Ghyampe Bridge (PSC 2-Webbed Deck-Slab Bridge)								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	Detour Road, Village Access Road Construction & Maintenance Work																															
2	River Training Work and Approach Road																															
3	Bridge Construction : Open Foundation(footings)																															
4	Bridge Construction: Substructures(Abutments)																															
5	Bridge Construction: Superstructures(PSC girder , slab +wearing surface)																															
6	Embanked Approach Road including Approach Slabs																															
7	Asphalt Pavement Work on Bridge and Approach Road & Finish Work																															

The Photographs



Minutes of 6th JCC

DEPARTMENT OF ROADS
MINISTRY OF PHYSICAL INFRASTRUCTURE AND TRANSPORT
GOVERNMENT OF NEPAL

MINUTES OF MEETING
ON
6th JOINT COORDINATING COMMITTEE (JCC) MEETING
FOR
THE PROJECT FOR THE OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD
PHASE 2

2nd March 2022

JICA Expert Team

MINUTES OF MEETING
ON
6th JOINT COORDINATION COMMITTEE MEETING
FOR
THE PROJECT FOR THE OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD PHASE 2

Date & Time : 2nd March 2022, 10:30– 13:30 hrs. (NST), 13:45– 16:45 hrs. (JST)
Place of Meeting : Zoom Meeting
Participants : See attached participants list (***Annex I***)

A. Agenda:

1. Mr. Ram Hari Pokharel, Project Director and DDG, DOR
   Opening of 6th JCC Meeting, Opening Speech
2. Mr. Rabindra Lal Das, Project Manager of the Sindhuli Road, DOR
   Tender results of the pilot project and Current status
   Construction plan for major works to be implemented by the DOR for FY 2021/22
3. Mr. H. Shinkai, Chief Advisor, JICA Expert
   Overall progress and current issues of the SROM 2 including overlay, etc.
   Monitoring plan of construction for the pilot project (progress, quality and safety controls)
4. Mr. R. P. Koirala & Mr. T. Hayakawa, JICA Experts
   Recommended work plan of 3-Bridges of the pilot project and critical issues related to the construction (Mr. Koirala)
   Outline of a design manual for RC continuous slab bridge (Mr. Hayakawa)
   Training program for users of design manual (Mr. Hayakawa)
5. Question & Answer
6. Mr. B. S. Rana, JICA Expert
   Traffic safety analysis including training program and next traffic survey plan
7. Mr. M. Iwamaru, Deputy Chief Advisor, JICA Expert
   Digitalization of road inventory and road maintenance data
8. Mr. A. K. Karna JICA Expert
   Monitoring report on the operation and management of EIS
9. Mr. K. Narita, JICA Expert
   Monitoring report on the toll road system being implemented by RBN
10. Ms. N. Sagawa, JICA Expert
    Project progress monitoring
11. Question & Answer
12. Mr. Sanjeeb Baral, DDG, DWRI
    Remarks
13. Mr. Prem Prakash Khatri, Executive Director, RBN
    Remarks
14. Mr. Akimitsu Okubo, Chief Representative, JICA Nepal Office
    Remarks
15. Mr. Ram Hari Pokharel, Project Director and DDG, DOR
    Closing Remarks

B. Proceedings and Discussions

Following with the Record of Discussions (hereinafter referred to as "R/D") for the Project of the Operation and Maintenance of the Project Phase 2 (hereinafter referred to as the "Project" or "SROM2"), the Department of Roads (hereinafter referred to as the "DOR") held the 6th the Joint Coordinating Committee (hereinafter referred to as "JCC") Meeting to discuss and approve the various agenda (mentioned above) of the Project on 2nd March 2022. The meeting was held on Zoom. The participants took part in the meeting from their respective institutions.

The proceedings of the 6th JCC Meeting have been presented below.

1. An introduction of each participant along with their organization was made by the facilitator at the beginning.

2. Some ground rules set for the online zoom meeting were announced.

3. Opening Remarks by the Chairperson Mr. Ram Hari Pokharel, the Deputy Director-General, Development Cooperation Implementation Division and the Project Director of SROM2, DOR

   In his opening remarks, Mr. Pokharel expressed his immense pleasure to welcome all participants of the JCC-6 Meeting of SROM2. He thanked the Government of Japan (GOJ) for supporting the Project and also thanked JICA for supporting different stages of the development of Sindhuli Road. The Sindhuli Road has played a vital role in the socio-economic development of Nepal by linking the shortest route between the national capital city Kathmandu to the eastern Terai and adjacent hilly districts. The program for constructing three motorable bridges with double lane standards is going on as expected and as planned. He requested the JICA Expert Team for continuous technical support up to the completion of the bridge construction works. He also requested support on quality control, pavement overlay, and construction of bridges for FY 2022-23 for Surya Binayak-Dhulikhel, Dhulikhel-Sindhuli Bardibas Road Project. Like, the asphalt pavement training conducted last year to the DOR Engineers by JICA Support, which was observed very fruitful, he further requested to continue similar training for this fiscal year also. Further, he requested the JICA to consider the preparation of DPR for improving this road up to double lane standard as some of the initial survey works, etc. had been done from the JICA headquarter earlier. He also requested the JICA for assisting in the preparation of DPR of Khurkot-Chiyabari tunnel section on this road. The outcome of this JCC meeting will be very much fruitful for the effective and efficient development of Sindhuli Road. All participants of this meeting will be actively involved. He praised the long relationship between Nepal and Japan.

4. Mr. Rabindra Lal Das, the Project Manager of Sindhuli Road Project, made his presentation on various topics comprising of (a) Tender results of the pilot project and Current status, and (b) Construction plan for major works to be implemented by the DOR for FY 2021/22

   The outline of his presentation was comprising of Project Office Background, Project Status of Pilot Project, Status of Road Maintenance Activities along BP Highway, Status of EIS and Road Safety and some burning Issues. Progress of Major works under RBN, Progress of GoN Budget, Implementation Schedule of Pilot Project, other works including Pavement

Overlay and EIS and some burning issues including Mushrooming access road construction and dry landslides problems due to irresponsible Crusher Plants established at nearby roads.

5. Mr. H. Shinkai, the Chief Advisor of JICA Expert Team (hereinafter referred to as "JET"), presented his presentation in the topic (1) Overall Progress of the SROM-2 and the current issues and (2) Monitoring Plan of the Pilot Project (3 bridges).

First, he thanked all participants for their presence. He said that JET has reported not only the activities that they have done in the last seven months, but they are reporting the activities that they should do in the remaining period of the contract under SROM-2 (till January 2023). He promised to do best to produce output of the technical assistance in the remaining 11 months. He requested the participants to provide their frank opinion.

(1) Overall Progress of the SROM-2 and the current issues

First, he presented the overall Progress of the SROM-2 Activities comparing the actual progress with the original plan. The overall Progress (as of February 2022), he informed the meeting that (a) the project was approved for a one-year extension due to the COVID-19 at the 4th JCC meeting held in 2020. (b) The next 7th JCC meeting will be at the end of August 2022 (tentative), and (c) The SROM-2 activities are doing almost as planned and will be completed by the end of January 2023 except for the Pilot Project. The Pilot Project will be expected to complete by September 2023 as per the Contract between the DOR and the Contractors. He further explained the work progress of the major activities based on various outputs set earlier. Under output-I: Improvement of Road Maintenance Works, a number of major activities like Improvement of Pavement (Overlay & Reconstruction), Countermeasures for water-induced erosion, and Introduction of Toll System by RBN (Introduction of HETC) were discussed. Likewise, under Output II: Improvement of Road Traffic Management, Preparation of Road Inventory by digitalization, Traffic Safety Measures including Traffic Survey, Improvement of EIS (Construction of RIB at Khurkot), and Preparation of traffic safety education materials were discussed. Further, under Output-III: Transfer to Technology through Pilot Project (3 bridges), Survey Design, Cost estimate, and Tender Assistant, Technical Support for Implementation of 3 bridges of Pilot Project, Workshop on Pilot Project/ training for users of Design manual of RC Continuous Slab Bridge, Technology Transfer Program including Seminar and Technical tour were discussed. Since some of the bridge construction progress is observed late (Ghyampe & Bhyakure), effective discussion with the contractors is required as soon as possible, he pointed out. He further highlighted the Important Activities to be done in the remaining one-year time period that is (a) Construction of Pilot Project as scheduled, (2) Completion of Pavement Overlay, (3) Strengthening of Traffic Safety Measures, (Digitalization of road inventory data, (5) Transfer of EIS to DOR HQ and, (6) Early implementation of HETC. He categorically stated that JICA Team will provide appropriate technical support to the DOR and the Contractors through the monitoring activities in the remaining period. The monitoring method using the drone will be one of the tools which definitely will improve the construction management of the DOR. The other technological programs are the seminar and OJT training for DOR's users using the bridge design manual prepared by JICA Team. He further provided elaborated recommendations to the activities that are remained for an upcoming 11-months period.

(2) Monitoring Plan of the Pilot Project (3 bridges)

The Chief Adviser briefly presented the outline of the monitoring plan of the Pilot Project (3-bridges). This monitoring plan was created by the JET to facilitate the transfer of technology to the bridge construction management to the DOR Staff and the Contractor. In his presentation, he explained the role of the JICA Expert Team and other counterpart agencies including DOR, DWR. DOR, the main counterpart agency of the SROM-2, is fully responsible for implementing three bridges of the Pilot Project. DWRI is responsible for assisting the DOR with the river training works that are included as a part of the pilot project. JET is the technical advisory group entrusted by JICA for implementing the SROM-2 and is responsible for providing technical support to the DOR and DWRI for the implementation of pilot projects. JET does not give direct instructions to the Contractor, but through the DOR as needed. He further presented the monitoring plan for three bridges under three activities, like (1) Monitoring with a drone by JET, (2) Monthly Joint Site Inspection by DOR and JET, and (3) Management Meeting chaired by DOR.

6. Mr. Ramesh P. Koirala presented on the topics (a) Recommended Work Plan of 3-Bridges of The Pilot Project and Critical Issues Related to the Construction. In his presentation, he has covered the following contents, (1) Layout of Bridges (2) Progress Monitoring (3) Construction Sequence and Method of Major Works (4) Safety Quality Related Activities and (5) Monitoring of Construction Activities. He also presented a short duration video clip taken by the drone of Mamti river foundation concreting works recently.

   Likewise, Mr. Tomokuni Hayakawa presented on the topics (a) Outline of design manual for Reinforcement Concrete (RC) continuous Bridge and (b) Training Program for users of design manual. He further explained that the design manual was prepared as the part of technology transfer of SROM-2. The manual was prepared based on the plan and design of the Mamti Bridge, a pilot project of SROM-2 and the RC continuous slab bridge will be adopted widely in Nepal. About the training program for users of Design Manual, the training program will tentatively be held on September 2022. Expected number of participants will be around 25 engineers from the DOR.

7. Mr. Bindu S. Rana presented with a brief explanation about Traffic Accident Analysis and Traffic Safety Education. The Contents in his presentation were (a) Yearly trend of Traffic Volume (b) Yearly trend of accident, (c) Traffic Safety Improvement, (d) Traffic Safety Education Plan, and (e) Next traffic Survey Plan. He presented many illustrations through tables, charts, and graphs to support his observations. He explained the necessity of various measures (hard and soft measures, both) that need to be implemented to mitigate the traffic accidents. He also explained about the plan for conducting road safety awareness campaign for teachers. Finally, he highlighted about the proposed traffic survey plan tentatively fixed on the last part of May 2022 at various five locations.

8. Mr. M. Iwamaru presented on the topic – Digitalization of Road Inventory and Road Maintenance Data. He explained in the contents comprising the (a) Fundamentals on Road Inventory, (b) Current Situations, (c) Issues, (d) Proposals for Road Inventory (f) Development Progress of the System, and (g) Conclusions. In his presentation, he explained about the necessity and definition of road inventory for common understanding. The usefulness of road inventory data can be utilized to establish an appropriate plan of future road management. He

also explained the type of data and appropriate method of their collection as well as their update. The current inventory of database consists of the design report and as-built drawings prepared at design/ construction period. He also explained about the issue of chainage confusion in Sindhuli Road due to the mix-up of different Sections (Section 1 to Section 4). To make the road inventory system as simple as possible, improvement is required through digitalization. He proposed some key points for improvement of the data through (1) Proper selection, (2) Automation, (3) Visualization and (4) Accuracy. To realize the improvement, he, with the help of some illustrations, further proposed the solutions including (a) Definition of Road Chainage System, (2) Digitalization of Road Inventory and (3) Driving Video System.

9. Dr. Akhilesh. K. Karna presented on the topic Monitoring Report and Operation and Management of EIS. The contents of his presentation were (1) Background, (2) Components of EIS, (3) Monitoring Result (4) New RIB Construction at Khurkot (5) Future Operation and Management of EIS, and (6) Rainfall based Warning System. He further explained about the two new RIBs which are recently installed at Khurkot. He also elaborated his remarks about the current situation of EIS. Finally, he explained the necessity of immediate handing over their operation from the Project Office to the DOR due to the shortage of skilled manpower in the project considering long term management. A short-term workshop will be conducted soon. He recommended to the DOR to coordinate with the DHM and create a new threshold and number of stations for rainfall-based warning criteria.

10. Mr. Kiyoshi Narita presented about on the topic Monitoring Report on the Toll Road System Implemented by RBN having contents comprising of (a) Current Status of the Toll Road System, (b) Current Status of HETC. Regarding the Current Status of the Toll Road System, He explained about the background of Introduction of Toll Collection System in Sindhuli Road, Toll Collector (Year 2019-2021), Toll Road Income (Year 2019-2021), Toll Collector (Year 2021-2023), Monitoring Result on the Current Toll System, Necessity of Automatic Toll Collection. Similarly, regarding the Current Status of HETC, Mr. Narita described about Toll Collection Method - ETC, Toll Collection Method – Non ETC, Bid Summary and recommendation on the Introduction of HETC.

11. Ms. Natsuko Sagawa, JICA Expert, presented the Project Progress Monitoring of SROM2. The Contents of her presentation covered (1) Record Progress by using Project Monitoring Sheet, (2) Utilization of Monitoring Sheet, (3) Update Information in the Monitoring Sheet Ver. 6.

12. Mr. Sanjeeb Baral, JCC Member, Deputy Director-General, Department of Water Resources and Irrigation (hereinafter referred to as DWRI)) expressed his pleasure to join in this meeting and further said that he has enjoyed and got a lot of opportunities to learn about the project activities. He thanked all participants and the presenter. This meeting is more focused on the road issues, he does not have a very specific issue to share, however, the technology used in this project is exemplary and we need to replicate these structures and the design in the other projects. In water induced disaster management sector we have a long history of cooperation with JICA and Japan. Even the Department of Water Induced Disaster Management was initiated under Japan's support and presently this has been merged with the Department of Water Resources and Irrigation. And we have one dedicated section of Water Induced Disaster Management within it. As presented in one of the presentations made earlier, the river training works and countermeasures work for water induced disaster is the responsibility of the DWRI,

which is under our jurisdiction, in the days to come, with close cooperation with DOR and Project Team, and as suggested by the DOR, we will identify the critical points and we will allocate necessary budgets. Recently DWRI has been doing a lot of policy drafting regarding disaster management as well as sediment management issues. DWRI will work with the JICA team together. Finally, he praised some of the technology proposed in this project with the establishment of an information system. Finally thanked once again for the opportunity of sharing his words.

13. Mr. Prem Prakash Khatri, the Executive Director of RBN addressing the meeting, expressed his happiness in participating in this meeting. He thanked all participants and the presenters. He enjoyed the presentation. As he said, he was attending as the representative of RBN to the JCC meeting for the first time. He highlighted the role of the BP highway as it is serving as the road, linking Terai with Kathmandu. It is delivering service to millions of road users. It was implemented with the kind grant of GoJ. Now, maintaining this road and delivering the best riding quality to the road users is a challenge. Therefore, the RBN has been allocating budget for maintaining this road since long back even since its construction phase. RBN considered this road a very important road for the socio-economic development of Nepal. RBN is allocating the budget as per the annual road maintenance plan as demanded. In the future also, RBN is dedicated to emphasizing its maintenance activities. Comparing the manual toll collection system through employing some contractors, the proposed system by the JET is very good. The manual system is almost like a failure in Nepal. He opted to go for an automated toll system. He appreciated Mr. Narita for his presentation. He requested DOR and JICA to organize a stakeholder meeting in MoPIT. For introducing a fully automated toll system, there are multiple agencies (stakeholders) are associated. Also, the local government's role may be important. On behalf of RBN, this has been confirmed for adopting a modern toll collection system. Finally, he thanked all participants once again.

14. Mr. Akimitsu Okubo, the Chief Representative of the JICA Nepal office addressed the meeting and expressed happiness for attending this 6th JCC meeting of SROM-2 for the first time. This meeting was an opportunity to know the SROM-2. Sindhuli Road is vital in the field of Society and economy. This road, being a JICA supported the project, is also a symbol of cooperation between Japan and Nepal. He talked that by attending the meeting he has learned first, about the upgrading of this road in its physical condition including the three bridges of the pilot project and other measures including safety facilities and the second is to upgrade the operation or management for the sake of efficient allocation of resources ranging from financing, safety measures, or a toll collection for maintenance and Covid-19 precautions too. These two aspects are meaningful and interconnected as well as important parts of the project. In the last part of his remarks, although there is limited time for the project, he encouraged , to work together by making this commemorative and historical project a success. He also requested the participants to carry out the project activities, especially the pilot projects by taking all the necessary precautions for ensuring the safety of the involved people.

15. Closing Remarks

Mr. Ram Hari Pokharel, the Project Director, DDG and the Chairperson of the Meeting, in his closing remarks mentioned the following points.

- First, he welcomed the new JCC members JICA Chief Representative, DDG, DWRI and ED of RBN who have attended the JCC Meeting for the first time.
- He thanked all participants for their kind patience.
- The introduction of drone monitoring (as explained in Mr. Shinkai Presentation) and video recording (Mr. Iwamaru Presentation) are good and can be replicate to other projects also.
- One half-day workshop about EIS System needs to be conducted as mentioned in Mr. Karna's presentation which earlier could not be conducted due to COVID-19.

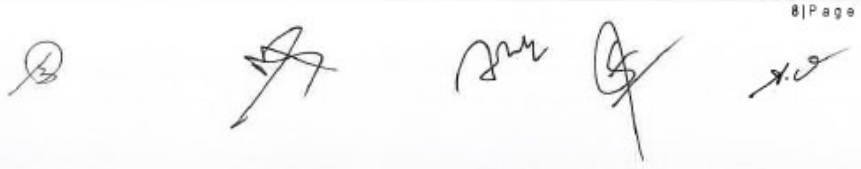
Finally, he thanked all participants for their active participation.

After a constructive discussion and having a confirmation of cooperation to implement the Project, the 6th JCC meeting was closed at 13:30 PM (NST) on 2nd March 2022 with the decisions made as presented hereunder.

C. Decisions

1. Pilot Project: The construction of pilot project was started in September 2021 and need to maintain the program schedule as decided. JICA experts will carry out technical assistant during this project period for steady completion of bridge construction including technical seminars.
2. EIS: DOR needs to take an action regarding the hand-over of EIS from the Sindhuli Road Office to DOR Headquarters. It is also recommended to organize a short (2-3 hours) workshop among the stakeholders regarding the operation and management of EIS.
3. Traffic Safety: In order to reduce the traffic accidents caused by rapid increase in traffic volume, it is important not only to take hard measures but also to take soft measures through traffic education. Further implementation program should be discussed among counterparts and JICA Expert Team.
4. Partial Widening and Pavement Overlay in Sec. IV: Although the 5km from Dhulikhel to Patalekhet section (Sec. IV) is the entrance to the Sindhuli Road, the pavement is significantly damaged despite the overlay done in few years ago. Upgrading road pavement for this section including partial widening is strongly recommended.
5. Road Inventory: DOR needs to be positive to discuss with JICA Expert Team to consider how to optimize the road inventory system for further effective road maintenance.
6. HETC: The method and contents of technical support expected to be provided by JICA needs to be discussed among RBN, DOR, JICA together with MoPIT because involvement of multiple sectors is essential to introduction of HETC.
7. 7th JCC Meeting: 7th JCC meeting shall be held in late August 2022.

All parties confirmed that in order to mitigate the effect of COVID-19 Pandemic, every protocol issued to the public by GoN, such as wearing mask, taking temperature and keeping social distance, shall strictly be followed accordingly through the Project's activities.



Ram Hari Pokharel
Deputy Director General (DCID)
Project Director
Department of Roads

Sanjeeb Baral
Deputy Director General
Department of Water Resources and Irrigation

Prem Prakash Khatri
Executive Director
Roads Board Nepal

大久保昭光
Akimitsu Okubo
Chief Representative
JICA Nepal Office
Japan International Cooperation Agency

Hiroki Shinkai
Chief Advisor of the Project
JICA Expert Team
Japan International Cooperation Agency

End

Annex 1 Participants' List

Institution	Name	Designation	Email Address
Department of Roads (DOR), Development, Cooperation Implementation Division (DCID)	Mr. Ram Hari Pokharel	DDG and the Project Director, SROM2	[redacted]
DOR, Sindhuli Road Project	Mr. Rabindra Lal Das	Project Manager	
	Ms. Gitanjali Koirala	Engineer	
	Mr. Karna Singh Khatri	Engineer	
Department of Water Resources and Irrigation DWRI	Mr. Sanjeeb Baral	Deputy Director General	
Road Boards Nepal, RBN	Mr. Prem Prakash Khatri	Executive Director	
	Mr. Sano Babu Prajapati	Senior Engineer	
Embassy of Japan, EOJ	Ms. Miyuki Ishida	First Secretary	
JICA Nepal Office	Mr. Akimitsu Okubo	Chief Representative	
	Mr. Yoshiki Ehara	Senior Representative	
	Ms. Ayuko Nakamura	Representative	
	Mr. Sourab Rana	Sr. Programme Manager	
JICA Headquarters	Mr. Yuki Ota	Officer	
	Mr. Masato Ashino	Officer	
JICA Expert Team, Sindhuli Road Oper. & Maint. Project Phase-2 SROM2	Mr. Hiroki Shinkai	JICA Expert, Chief Adviser	
	Mr. Motoki Iwamaru	JICA Expert	
	Mr. Tomokuni Hayakawa	JICA Expert	
	Mr. Bindu S. Rana	JICA Expert	
	Mr. Ramesh P. Koirala	JICA Expert	
	Mr. Akhilesh K. Karna	JICA Expert	
	Mr. Kiyoshi Narita	JICA Expert	
	Ms. Natsuko Sagawa	JICA Expert	
	Mr. Yohei Onomura	JICA Expert	
	Mr. Santosh Rai	NIPPON KOEI KTM Office	

Annex 2 The Photographs

Minutes of 7th JCC

DEPARTMENT OF ROADS
MINISTRY OF PHYSICAL INFRASTRUCTURE AND TRANSPORT
GOVERNMENT OF NEPAL

MINUTES OF MEETING
ON
7th JOINT COORDINATING COMMITTEE (JCC) MEETING
FOR
THE PROJECT FOR THE OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD
PHASE 2

25th August 2022

JICA Expert Team

MINUTES OF MEETING
ON
7th JOINT COORDINATION COMMITTEE MEETING
FOR
THE PROJECT FOR THE OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD PHASE 2

Date & Time : 25th August 2022, 10:30– 13:30 hrs. (NST), 13:45– 16:45 hrs. (JST)
Place of Meeting : Zoom Meeting
Participants : See attached participants list (***Annex 1***)

A. Agenda:

1. Mr. Ram Hari Pokharel, Project Director and DDG, DOR
   Opening of 7th JCC Meeting, Opening Speech
2. Mr. Rabindra Lal Das, Project Manager of the Sindhuli Road, DOR
   Budget Allocation Plan of the Sindhuli Road in ARMP of 2022/2023
   Overall Progress of Road Maintenance Works of the Sindhuli Road and Issues, etc.
3. Mr. H. Shinkai, Chief Advisor, JICA Expert
   Overall Progress of the SROM2 activities (as of August 2022)
   Current Issues of the SROM 2 activities and Recommendations
4. Mr. R. P. Koirala & Mr. T. Hayakawa, JICA Experts
   Status of Pilot Project of 3 Bridges (Ghyampe, Mamti, Bhyakure) (Mr. Koirala)
   Training and Workshop on the Pilot Project (Mr. Hayakawa)
5. Question & Answer
6. Mr. B. S. Rana, JICA Expert & Er. Shambhu P. Acharya, SDE, Sindhuli Road
   Traffic Safety Activities (Mr. B. S. Rana)
   Road Safety Awareness, Training for School Teachers (Mr. S. P. Acharya)
7. Mr. Sanu Babu Prajapati, Sr. Engineer, RBN & Mr. K. Narita, JICA Expert
   Current Toll Collection System and Necessity of ETC
   Findings of Preliminary Survey for Introducing ETC on the Sindhuli Road
8. Mr. A. K. Karna, JICA Expert
   Necessity of Integrating Operation and Maintenance of EIS
9. Mr. M. Iwamaru, Deputy Chief Advisor, JICA Expert
   Domestic Technical Tour at Nagdhunga Tunnel Construction Project (Output-3)
   Debris flow at Kaldhunga stream (Output 1)
10. Ms. N. Sagawa, JICA Expert
    Project Evaluation Method of SROM2
11. Question & Answer
12. Mr. Sanjeeb Baral, DDG, DWRI
    Remarks
13. Mr. Sagar Gyawali, Acting Executive Director, RBN
    Remarks
14. Mr. Akimitsu Okubo, Chief Representative, JICA Nepal Office
    Remarks
15. Mr. Ram Hari Pokharel, Project Director and DDG, DOR
    Closing Remarks

B. Proceedings and Discussions

Following with the Record of Discussions (hereinafter referred to as "R/D") for the Project of the Operation and Maintenance of the Project Phase 2 (hereinafter referred to as the "Project" or "SROM2"), the Department of Roads (hereinafter referred to as the "DOR") held the 7th the Joint Coordinating Committee (hereinafter referred to as "JCC") Meeting to discuss and approve the various agenda (mentioned above) of the Project on 25th August 2022. The meeting was held on Zoom. The participants took part in the meeting from their respective institutions.

The proceedings of the 7th JCC Meeting have been presented below.

1. An introduction of each participant along with their organization was made by the facilitator at the beginning.

2. Some ground rules set for the online zoom meeting were announced.

3. Opening Remarks by the Chairperson Mr. Ram Hari Pokharel, the Deputy Director-General, Development Cooperation Implementation Division and the Project Director of SROM2, DOR

   In his opening remarks, Mr. Pokharel expressed his immense pleasure to welcome all participants of the JCC-7 Meeting of SROM2. He thanked the Government of Japan (GOJ) for supporting the Project and also thanked JICA for supporting different stages of the development of Sindhuli Road. The Sindhuli Road has played a vital role in the socio-economic development of Nepal by linking the shortest route between the national capital city Kathmandu to the eastern Terai and adjacent hilly districts. The program for constructing three motorable bridges with double lane standards is going on as expected within this fiscal year. He requested the JICA Expert Team for continuous technical support up to the completion of the bridge construction works. He also requested support on quality control, pavement overlay, and construction of bridges from the expert team. Like, the asphalt pavement training conducted last year to the DOR Engineers by JICA Support, which was observed very fruitful to the DOR Engineers, he further requested to continue similar training for this fiscal year for 20 DOR Engineers probably in October. This will play a better role in the quality construction of asphalt road pavement. In addition, one road safety training conducted from the Project side was also very much effective. He requested such training in this fiscal year also. Further, he requested the JICA to support preparing of DPR for improving this road up to double lane standard as some of the initial survey works, etc. had been done from the JICA headquarters earlier. He also requested the JICA for assisting in the preparation of Detailed Project Report (DPR) of Khurkot-Chiyabari tunnel section on this road. The outcome of this JCC meeting will be very much fruitful for the effective and efficient development of Sindhuli Road. He hailed the long relationship between Nepal and Japan.

4. Mr. Rabindra Lal Das, the Project Manager of the Sindhuli Road Project, made his presentation on various topics comprising (1) the Budget allocation plan of the Sindhuli Road in Annual Road Maintenance Program, (ARMP) of 2022/2023 and, (2) the Overall progress of the road maintenance works of the Sindhuli Road and issues, etc.

The contents of the presentation were (a) Background of Project Office (b) Annual progress summary Fiscal Year (FY) 2078/79 (c) Planned Maintenance Activities in FY 2079/80, (d) Progress Status of Pilot Project, and (e) Some Burning Issues

Briefly, he presented the overall status of each program that is under construction through different budgetary supports and the updated financial progress. He presented the activities with the help of the latest photographs.

He finally spelled out the burning issues including mushrooming access road construction and dry landslides problems due to irresponsible Crusher Plants established on nearby roads.

5. Mr. H. Shinkai, the Chief Advisor of the JICA Expert Team, presented his presentation on the topic (1) Overall Progress and Current Issues of the SROM-2 Activities and (2) Current Issues of the SROM2 Activities and Recommendations.

First, he thanked all participants for their presence. He said that SROM2 activities will end by the end of January 2023. We have only six months' time period available to complete. Therefore considering the present low progress, we need to accelerate our activities to complete them before next JCC-8 meeting, scheduled in January 2023. Under SROM-2 a design and consulting works is being supported by the JET.

Regarding (1) Overall Progress and current issues of the SROM-2, there are three expected outputs which are as listed below.

Output 1: Improvement of Road Maintenance Work - Partial widening of Sec. IV, Pavement overlay work, Countermeasures for water-induced damages, and introduction of Toll System

Output 2: Improvement of Road Traffic Management - 2nd Traffic survey, Traffic safety measures master plan, Awareness of traffic safety measures to school teachers and integration of RIB.

Output 3: Technology Transfer through Implementation of Pilot Project - Plan & design of three (3) bridges, technical support to the construction of 3 bridges, workshop & seminar, and local technical tour

In order to achieve these outputs, it was needed to do many activities which were briefly mentioned in his presentation.

Regarding (2) Current Issues of SROM 2 Activities and Recommendation, he has mentioned the following issues

i. Delay in progress of Pilot project (3 bridges)

Construction of Bhyakure and Ghyampe bridges except Mamti bridge is delay in progress almost a year.

Although the contactor(s) claimed that the project can be completed within a contract period, the construction will be very tight without allowance.

Since technical support of JICA team will end in January 2023, DOR is requested to conduct the strict progress control for remaining work, especially substructure works.

ii. Progress of overlay work

55% of the Sindhuli Road has already been covered by overlay, and if includes the contracted sections, about 80% of the sections are expected to be completed by the end of the year.

Since, existing pavement of Double Bitumen Surface Treatment (DBST), which was constructed more than 10 to 15 years ago, has already exceeded its designed life, it is recommended that the entire stretch of Sindhuli Road will be covered by overlay within 1-2 years.

Keeping the road surface in good condition is the one of most important tasks of the road maintenance activities.

iii. Damages to the Sindhuli Road caused by quarry operation and construction of local road

Quarry Sites under operation & Kaldhunga local road under construction

Number of quarry sites in Section. IV: 15, we need to consider the increase of the thickness of overlay in the Sec. VI.

Debris flow caused by construction of local road at Kaldhunga. Construction of local road has caused great damages on the National Highway (NH) of the Sindhuli Road.

Need countermeasures beyond the scope of road maintenance

iv. Priority measures for traffic safety improvement

Master Plan of Traffic Safety Measures

It is recommended to prioritize and implement in consideration of the social and topographical characteristics of each section

v. Transfer of ownership of RIB (Road Board Information) to DOR Head Office

Exiting road information board (RIB) installed at the Sindhuli Road are not functioning well and the emergency information are not displayed properly and timely on the boards.

The situation of RIBs installed on other national highways, such as Naubise-Mugling road, Mugling-Narayanghat road etc. are also the same.

There are limits to the maintenance and management of RIB system by the project office. An integrated organization is needed to oversee this RIB system.

It is recommended that either Traffic Unit/Human Management Information System (HMIS) or Maintenance Branch of the DOR Head office should take the initiative to establish a new RIB management system as soon as possible.

vi. Early introduction Electronic Toll Collection (ETC) system to the Toll Road

The revenue of toll collection is one the important financial source for road maintenance funds that Roads Board Nepal, RBN must secure.

However, current toll collection system by hands is not efficient and effective.

Introduction of an efficient and appropriate toll collection system using ETC is indispensable for increasing road maintenance funds.

JICA team is currently conducting a survey in cooperation with RBN to

investigate the possibility of introducing ETC. The result of survey will be submitted by the end of the year.

6. Mr. Ramesh P. Koirala presented on the topics Status of Pilot Project Bridges [Ghyampe, Mamti & Bhyakure]. In his presentation, he has covered the following contents Current Progress of the Pilot Projects until July 2022, Current site conditions of detour roads at each bridge site, Maintenance work by the Contractors (if any), and the Revised Construction plan after the rainy season and Issues and Comments for the revised schedule.

   Likewise, Mr. Tomokuni Hayakawa presented the topics of Training and Workshop on Pilot Project. He further explained the purpose of the training and workshop as a part of the technology transfer activity. The training program and workshop basically cover the plan, design of RC continuous bridge using the Design Manual by JET, and the implementation of the pilot projects. The Training and Workshop was proposed to hold on October 12 to 14, 2022.

7. Mr. Bindu S. Rana presented with a brief explanation about Traffic Safety Activities. The Contents of his presentation were (a) Traffic Safety Workshop (Planning) (b) Traffic Survey 2022, (c) Traffic Accident Trend (Updated), (d) Traffic Safety Improvement Plan, and (e) Traffic Safety Education / Teachers Training (Report). He started that he was planning a workshop in October 2022. The purpose of this workshop is to interact the knowledge of traffic safety activities in SROM2 so that DOR and other traffic safety organizations can continuously improve their traffic safety activities even after the end of the project. Assumed participants are Sindhuli Road, DOR Headquarters, Roads Board Nepal (RBN), Department of Transport Management (DOTM), Traffic Police and donor agencies. He presented many illustrations through tables, charts, and graphs to support his observations of the Traffic Survey 2022. He compared the survey results like Annual Daily Traffic (ADT), Traffic Volume, Traffic Accident data, and their analyses, etc., with that of 2019. He also explained the Traffic Safety Improvement Plan through the present issues and measures (hard and soft, both), and actions to be taken. Finally, he presented the outline of Traffic Safety Education (Teachers' Training) recently conducted last June 2022.

   Er. Shambhu P. Acharya, Senior Divisional Engineer at Sindhuli Road Project presented about Road Safety Awareness Training for School Teachers. He briefly explained the training program conducted in June 2022 and highlighted various aspects including the objective of the training, Road safety issues, selection criteria, training materials, and evaluation of the training. Finally, he pointed that almost all participants welcomed this fruitful initiation and evaluated the training program as contributing to the reduction of traffic accidents. Also he notified that the training was covered by some local and national newspaper.

8. Er. Sanu Babu Prajapati, Sr. Engineer of RBN presented on the subject Current Toll Collection System & Necessity of ETC. In the beginning, he presented some of the acts and regulations like Roads Board Act 2058, Toll Collection Regulation 2060 & Toll Collection Regulation (First Amended) 2063, etc., based on which the RBN is mandated to perform its designated activities. In his presentation, he briefly explained the current Toll System on Sindhuli Road, present toll rates, the status of toll collectors, revenues (expected and collected), and problems that are faced at present. Finally, he presented the reasons why the Electronic Toll collection (ETC) is by justifying its importance.

Mr. Kiyoshi Narita (Mr. Kondo and Mr. Hayashi as co-presenter) presented the topic Finding of Preliminary Survey for Introducing ETC on the Sindhuli Road having contents comprising of (a) The Overview of the Survey, (b) Finding of Preliminary Survey (tentative). Under the sub-topic 'the overview of the Survey', he further elaborated on the various aspects like background, the purpose of the survey, etc. Similarly under the second topic ' Finding of Preliminary Survey (tentative)' he explained the various process of the cases of the ETC like one-stop processing (touch & go process), and non-stop processing (fully wireless system). He also presented the finding of a Preliminary survey illustrated with pictures. Finally, he presented their upcoming schedule of activities. The team will report their findings by the next JCC meeting.

9. Dr. Akhilesh. K. Karna presented on the topic Necessity of Integrating operation and maintenance of Emergency Information System (EIS). The contents of his presentation were (1) Background, (2) Components of EIS, (3) Issues, (4) Necessity of integration of EIS, and (5) Transfer of EIS to DOR central unit. In his presentation, he pointed out some of the important issues related to the EIS especially related to the (a) maintenance of the Components, (b) Operation of EIS, (c) Installation of EIS (RIB) by different DOR Divisions and (d) Data center is currently being supported by Softwel. He also explained elaborately the necessity of integration in maintaining, operating, and extending EIS within one central unit (under DOR). He further proposed to conduct a workshop among various stakeholders for long-term management of EIS in order to (i) develop an understanding of EIS, (ii) discuss responsible organization, (iii) modality of EIS transfer, (iv) responsible organization for operation, and (v) timeline of transfer.

10. Mr. Motoki Iwamaru presented on two topics (1) Domestic Technical Tour at Nagdhunga Tunnel Construction Project, and (2) Debris Flow Issue at Kaldhunga Stream. In his first presentation, he explained the outline of the tour, Program Report, and evaluations. He further clarified that the domestic tour was conducted to share good practices and lessons learned on project activities with DOR HQ and other regional offices. In this aspect, Nagdhunga Tunnel Construction Project (NTCP), which is currently being implemented by the DOR with financial support from JICA, is an appropriate project to visit.

    In his second presentation, he explained the problem at Kaldhunga stream is located in CH.120 Section IV, near Mangaltar on B. P. Highway. Kaldhunga Stream, having a very small catchment size (0.70 km2) has started bringing a lot of debris in the last few years. Roads often suffer from being covered in debris from upstream of a natural stream. He further explained with the help of pictures that measures were taken in the past from 2014-15 by checking the dam (upstream) and roadside gabion wall. He also provided some recommendations by working together with concerned agencies and local governments.

11. Ms. Natsuko Sagawa, the JICA Expert, presented about Project Evaluation Method of SROM2. Her presentation contains (a) Project Monitoring Sheet (b) Contents of PDM, (c) Updated Information in the Monitoring Sheet Ver. 7, (d) Evaluate method of the Project, (e) Overall Goal and its Indicators, (f) Table of Contents of PCR, and (g) Information to be needed & Schedule for PCR. As she explained that the Project Completion Report (PCR) is a document to externally indicate the results of initiatives as published information until the time of project completion and the PCR will be served as a major document to be referred to in the ex-post evaluation (3 years after completion of the Project). For PCR preparation, JET requests CPs to provide necessary information such as emergency facilities mobilization record or road maintenance records.

12. Mr. Sanjeeb Baral, DDG of DWRI sent the following message to the meeting. Due to some unavoidable situation (the DWRI has another urgent meeting) the participation from their side could not be made. He further informed that they will send their proposal (including the schedule of Sunkoshi-Marin Diversion Construction) to the Sindhuli Road Project office soon.

13. Mr. Sagar Gyawali, the Executive Director of RBN addressing the meeting, expressed his immense pleasure to be a part of this 7th JCC meeting under SROM-2. As per various Acts and regulations, the Government by notification through the gazette may impose a levy of the toll on motor vehicles. Accordingly, the toll system was introduced in Nepal in 2056 BS on three different sections of roads. Later on, in 2076 BS, Sindhuli Road fell under the toll system in two sections namely Dhulikhel-Khurkot Section and Khurkot-Bardibas Section. At present, the toll collection under the Sindhuli Road has been stopped due to several reasons including the COVID pandemic, road sections undergoing upgradation, and lack of contractors' participation in toll collection bidding despite several times call for the bidding. Therefore, the executive committee has formed a sub-committee to review the standard bidding documents for the collection of road users' fees. As known, toll collection is meant to maintain road management, but the existing toll collection system is conventional and has to face several issues including double taxation, political and local pressure, alternate routes, etc. To minimize the hassles in toll collection, the introduction of ETC is necessary. Since the preliminary survey for the introduction of ETC has already started, RBN believes a joint effort of RBN, DOR, and JICA will lead to us introducing ETC in Sindhuli Road as a modern road of toll collection. Further remarks on the budget allocation plan of Sindhuli Road in ARMP 2022/023 and overall progress of the road maintenance and issues, achievement of PDM activities, and current issues of SROM2 activities, etc. are elaborated effectively. A detailed presentation on the whole project and issues of the pilot project and the schedule of the training on the Continuous RC bridge design manual are very fruitful. Presentation of the results of the School Teachers' seminar and results of the traffic survey and proposed traffic measures master plan is useful. Regarding the presentation of the toll collection system and the necessity of ETC and the finding of the preliminary survey for introducing ETC in Sindhuli Road are assisting documents for the detailed design of the ETC system in Sindhuli Road. Integration of EIS is very useful. Presenting the debris flow report of Kaldhunga in Section 4 and the Project Evaluation method of PDM activities of SROM2 is good and nice. Finally, he thanked all concerned persons who are directly or indirectly involved in this nodal project.

14. Mr. Akimitsu Okubo, the Chief Representative of the JICA Nepal office expressed his gratitude to all attendants of today's 7th JCC meeting of SROM2, especially showing his respect and appreciation to the presenters. He said all the presentations helped to deepen the understanding of each component of this project and the latest situation. The recommendations are also valuable for the betterment of our project. Recalling his first visit to Sindhuli Road two months before, across the Mahabharat range, he looked to the past. Twenty years were spent on the construction of this renowned road, and many people including Japanese and Nepali made hard effort for the construction. Some people lost their precious lives. The visit provided him with an impression to confirm the value of Sindhuli Road in the past and present. He mentioned today's discussion will enhance the value of the precious Sindhuli Road for the future : This project shows that the cooperation between Japan and Nepal will continue on the stage of Sindhuli Road in the future. As Chief Representative of the JICA Nepal office, he promised to make his best effort for the success of this monumental project. If any problems are faced in this project, he requested not to hesitate to contact JICA Nepal Office. Finally, he wished every success of the project and

Sagar

also hoped that today's discussion of more than two hours will bring the project to its successful completion.

15. Closing Remarks

Mr. Ram Hari Pokharel, the Project Director, DDG and the Chairperson of the Meeting, in his closing remarks mentioned the following points.

- He thanked all participants for their kind patience.
- First, he provided thanks to the JICA Chief Representative, DDG, DWRI and ED of RBN and all the presenters. Also provide a special thanks to the JICA Chief Representative for his remarks in Nepali Language also.
- He hoped that this meeting will be very fruitful and we will meet again in the next JCC meeting in January 2023.

Finally, he thanked all participants for their active participation.

After a constructive discussion and having a confirmation of cooperation to implement the Project, the 7th JCC meeting was closed at 13:30 PM (NST) on August 25, 2022 with the decisions made as presented hereunder.

C. Decisions

Since the SROM 2 activities will soon end in January 2023, both JICA Expert Team and C/P agencies including DOR, DWRI and RBN shall accelerate their activities in the remaining six (6) months. Both parties agreed to the following conclusions of today's 7th JCC Meeting.

1. In order to complete three (3) bridges of pilot project in September 2023 as scheduled, the Sindhuli Road Office, DOR will monitor the progress control of the pilot project strictly to recover for the delay in the pilot project.
2. Since the existing DBST pavement of the Sindhuli Road has exceeded its designed life significantly, DOR will accelerate the pavement improvement with overlay and complete the remaining stretch of the Sindhuli Road within 1 to 2 years.
3. Damages to pavement and slope failure caused by the quarry operations in Section 4 and the debris flow due to the construction of community/local roads being constructed by the local government have become serious. CPs are advised to consult with concerned organizations and decide an appropriate countermeasure as soon as possible.
4. To cope with the increase in traffic accidents accompanied with increased traffic volume of the Sindhuli Road, the traffic safety improvement measures should be strengthened and implemented in according with the proposal in Traffic Safety Improvement Master Plan prepared by the JICA team.
5. The management method of the road information board (RIB) shall be discussed including not only with the Sindhuli Road Office, but also with other national road offices and related organizations. DOR, the management organization, needs to hold a meeting for system integration of EIS, and JET will support it as long as project period.
6. The finding of preliminary survey regarding the introduction of ETC, which is under implementation by JICA expert team and RBN jointly, will be reported by the next JCC meeting.

7. Workshop on Pilot Project and Traffic Safety

   (1) Pilot project: 12 – 14 October (Workshop, Training on Manual of RCSB and Site visit)

   (2) Traffic safety: 19th October (Workshop)

   Note: The schedule of Workshop on Traffic Safety will be changed subject to the convenience of participants.

8. Project Completion Report will be drafted by the end of December 2022. For the report preparation, CPs are requested to share necessary information as per advised by JET.
9. 8th JCC Meeting: 8th JCC meeting shall be held in middle January 2023.

All parties confirmed that in order to mitigate the effect of COVID-19 Pandemic, every protocol issued to the public by GoN, such as wearing mask, taking temperature and keeping social distance, shall strictly be followed accordingly through the Project's activities.

Ram Hari Pokharel
Deputy Director General (DCID)
Project Director
Department of Roads

Sanjeeb Baral
for SDE, Mukesh Pathak
Deputy Director General
Department of Water Resources and Irrigation

Sagar Gyawali
Acting Executive Director
Roads Board Nepal

Akimitsu Okubo
Chief Representative
JICA Nepal Office
Japan International Cooperation Agency

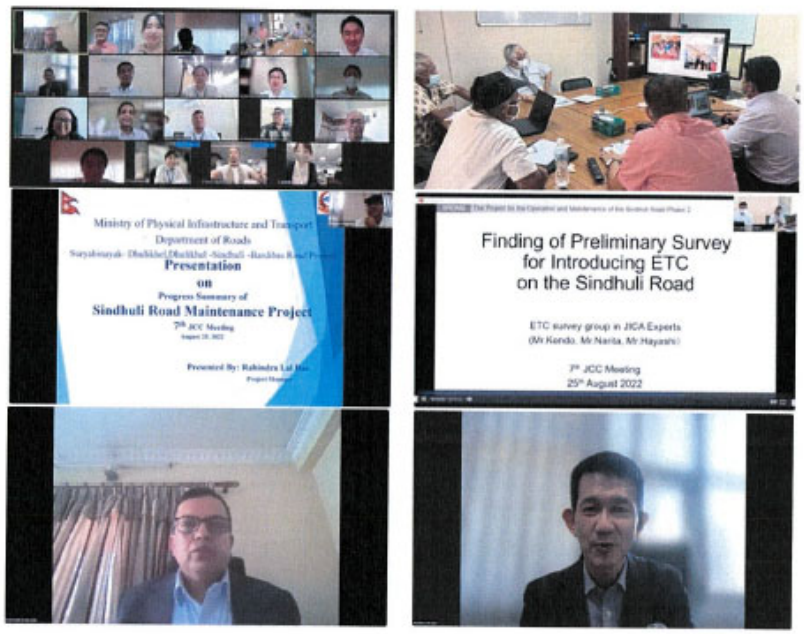
Hiroki Shinkai
Chief Advisor of the Project
JICA Expert Team
Japan International Cooperation Agency

End

Annex 1 Participants' List

Institution	Name	Designation	Email Address
Department of Roads (DOR), Development, Cooperation Implementation Division (DCID)	Mr. Ram Hari Pokharel	DDG and the Project Director (Chairperson)	[redacted]
DOR, Sindhuli Road Project	Mr. Rabindra Lal Das	Project Manager	
	Mr. Shambhu P.Acharya	Sr. Divisional Engineer	
	Mrs. Gitanjali Koirala	Engineer	
	Mr. Karna Singh Khatri	Engineer	
	Mr. Ananta Baral	Engineer	
	Mr. Ghyanendra Kalauni	Engineer	
Department of Water Resources and Irrigation DWRI	Mr. Sanjeeb Baral	Deputy Director General	
	Mr. Mukesh Pathak	Senior Div. Engineer	
Road Boards Nepal, RBN	Mr. Sagar Gnawali	Acting Exe. Director	
	Ms. Chetna Thapa	Director Administrator	
	Er. Sanu Babu Prajapati	Senior Engineer	
	Er. Dharma Raj Upadhyay	Engineer	
JICA Nepal Office	Mr. Akimitsu Okubo	Chief Representative	
	Mr. Yoshiki Ehara	Senior Representative	
	Ms. Ayuko Nakamura	Representative	
	Ms. Yukari Maeda	Representative	
	Mr. Sourab Rana	Sr. Programme Manager	
JICA Headquarters	Mr. Yuki Ota	Officer	
JICA Expert Team, Sindhuli Road Oper. & Maint. Project Phase-2 SROM2	Mr. Hiroki Shinkai	Chief Adviser	
	Mr. Motoki Iwamaru	Deputy Chief Advisor / Road O/M Planner	
	Mr. Tomokuni Hayakawa	Road Structural Planner	
	Mr. Bindu S. Rana	Traffic Safety / Traffic Education / Project Coordinator	
	Mr. Ramesh P. Koirala	Road Structural Design (Causeway)	
	Mr. Akhilesh K. Karna	Road Disaster Prevention / EIS	
	Mr. Kiyoshi Narita	Toll Road System	
	Mr. Noboru Kondo	ETC 1	
	Mr. Ryohei Hayashi	ETC 2	
	Ms. Natsuko Sagawa	Coordinator / Project Monitoring	
	Mr. Santosh Rai	Secretary, Nippon Koei KTM Office	

Annex 2 The Photographs



Minutes of 8th JCC

DEPARTMENT OF ROADS
MINISTRY OF PHYSICAL INFRASTRUCTURE AND TRANSPORT
GOVERNMENT OF NEPAL

MINUTES OF MEETING
ON
8th JOINT COORDINATING COMMITTEE (JCC) MEETING
FOR
THE PROJECT FOR THE OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD
PHASE 2

17th January 2023

JICA Expert Team

MINUTES OF MEETING
ON
8th JOINT COORDINATION COMMITTEE MEETING
FOR
THE PROJECT FOR THE OPERATION AND MAINTENANCE
OF
THE SINDHULI ROAD PHASE 2

Date & Time : 17th January 2023, 10:00– 12:00 hrs. (NST), 13:15– 15:15 hrs. (JST)
Place of Meeting : In-person Meeting / Zoom Meeting
Participants : See attached participants list (***Annex I***)

A. Agenda:

1. Mr. Ram Hari Pokharel, Project Director and DDG, DOR
   Opening of 8th JCC Meeting, Opening Remarks
2. Mr. Ganesh Bahadur KC, Executive Director, RBN
   Remarks
3. Mr. Sanjeeb Baral, DDG, DWRI
   Remarks
4. Mr. OKUBO Akimitsu, Chief Representative, JICA Nepal Office
   Remarks
5. Mr. Bindu S. Rana, Traffic Safety, JICA Expert Team & Mr. Karna Khatri, Engineer, SDDSBRP, DOR
   Strengthening Traffic Safety and Further Continuation
6. Mr. HAYAKAWA Tomokuni, Road Structure Planner, JICA Expert Team & Ms. Radhika Prajapati Shrestha, Sr. Divisional Engineer, SDDSBRP, DOR
   Outcome of Pilot Project and On-going Issues
7. Mr. NARITA Kiyoshi, Toll Road, JICA Expert Team & Mr. Sanu Babu Prajapati, Sr. Engineer, RBN
   Recommended Plan of ETC System for the Sindhuli Road
8. Mr. SHINKAI Hiroki, Chief Advisor, JICA Expert Team & Mr. Rabindra Lal Das, Project Manager SDDSBRP, DOR
   Mid / Long-Term Road Maintenance Plan
9. Mr. IWAMARU Motoki, Deputy Chief Advisor, JICA Expert Team & Mr. Rabindra Lal Das, Project Manager SDDSBRP, DOR
   Evaluations on Project Activities and Project Completion Report
10. Mr. Ram Hari Pokharel, Project Director and DDG, DOR
    Overall Evaluation of the Project and Closing Remarks

B. Proceedings and Discussions

Following with the Record of Discussions (hereinafter referred to as "R/D") for the Project for Operation and Maintenance of Sindhuli Road Phase 2 (hereinafter referred to as the "the Project" or "SROM2"), the Department of Roads (hereinafter referred to as the "DOR") held the 8th the Joint Coordinating Committee (hereinafter referred to as "JCC") Meeting to discuss and approve the various agenda (mentioned above) of the Project on January 17, 2023. The meeting was held on in-person & Zoom.

After some ground rules set for the online zoom meeting were announced, the 8th JCC Meeting proceeded as follows.

1. In the opening Remarks by the Chairperson Mr. Ram Hari Pokharel, the Deputy Director-General, Development Cooperation Implementation Division and the Project Director of SROM2, DOR, he heartedly welcomed all the participants of the JCC-8 and the final meeting of SROM2.

   He appreciated that the SROM2, started in April 2019, could be completed and achieved the goal of safer and smooth road traffic movement on Sindhuli Road. However, he stressed the necessity and importance on the following 8 issues, (1) partial widening, particularly in Section I, Section II and Section IV (Nepalthok to Dhulikhel) in the near future due to increase of recent traffic, (2) introduction of electronic toll collection (ETC) securing maintenance budget from the Roads Board Nepal (RBN), (3) transfer of emergency information system (EIS) to DOR head office, (4) strengthening the safety measures, (5) countermeasures for disaster on Kaldhunga Stream in Section IV as soon as possible in keeping close cooperation with Department of Water Resources and Irrigation (DWRI), (6) relocation of Sindhuli Road due to Sunkosi Marin Diversion Project (SMDP) near Khurkot closely with DWRI to minimize the impact on Sindhuli Road, (7) the need of strengthening the Sindhuli Road site office with manpower and equipment, and (8) technical support from JICA for realizing the michi-no-eki or roadside facilities. This eighth JCC meeting intends to be successful and expects the experts to provide necessary feedback.

2. Mr. Ganesh B. KC, the Executive Director of RBN addressing the meeting, expressed his immense pleasure to be a part of this 8th JCC meeting under SROM2. He explained the outline of the Roads Board Nepal (RBN) body, rules, regulations, toll levy and current toll system being operated on three sections of highways, that is Naubise-Mugling, Narayanghat-Butwal, and Narayanghat-Hetauda, which was stopped due to various reasons such as COVID-19, etc. For the collection in Sindhuli Road, the road user fee collection has been operated manually so that there is a need of upgrading the existing practice from manual to electronic. Although, RBN was trying to procure a contractor to introduce a hybrid toll collection center in 2021, but the bid was unsuccessful. Under such an experience, RBN requested during the 6th JCC meeting for technical support for the introduction of the Electronic Toll Collection (ETC) system. The RBN is very grateful to JICA for accepting the request of RBN and conducting the Preliminary survey to investigate the possibility of introduction of ETC introduction.

   As the result of preliminary survey, JICA Expert Team proved the necessity and validity of the introduction of Electronic Toll Collection (ETC) and recommended to Ministry of Physical Infrastructure and Transport (MoPIT) on December 22, 2022 an appropriate system and plan that matches the traffic conditions in Nepal including the road map for realization of this ETC system. MoPIT agreed with suggestions and plans proposed by

JICA Expert Team and suggested holding a stakeholders' consulting meeting as soon as possible with the integrated realization of importation of the ETC.

Finally, he would like to request technical support from JICA regarding the introduction of ETC on BP Highway which will take great shape and will become a model project in the future.

3. Mr. Sanjeeb Baral, DDG of DWRI in his remarks, thanked organizers for organizing the 8th JCC Meeting. He also thanked JICA for supporting the Sindhuli Road. He acknowledged the various issues in this road including the increased traffic volume day by day, hence the extension of some of the critical sections is very important and DWRI is likely to work together with JICA in the future on the widening works.

   He also thanked the JICA for giving approval for the construction of the Sunkoshi Marin Diversion Project (SMDP) despite a stretch of 900 m length of Sindhuli Road falling under the inundation area due to the construction of the proposed dam. During the construction of this multipurpose project, to manage the traffic and to make the operation continuous on this road, a 2.9 km diversion has been proposed. The project has already been awarded the contract and is presently under construction process. Following the road experts' advice and JICA approval, the road will be re-aligned back to its original position after the completion of the Project. He further assured that during the construction phase, the road (Sindhuli Road) will be continuously in operation.

   DWRI would allocate the department's budget and put their effort into the management of landslides and water-induced disaster places and assure DWRI's full support for the Sindhuli Road Project. He also believed that the cooperation between the DOR and JICA will continue in the coming days. Finally, He thanked the DOR and JICA on behalf of DWRI for their kind cooperation.

4. Mr. OKUBO Akimitsu, the Chief Representative of the JICA Nepal Office addressed the meeting and expressed his happiness in participating in this 8th JCC Meeting. He is very happy that the road has contributed significantly to improve the lives of the people in the rural areas east of Kathmandu, created numerous opportunities, and has been a reliable and efficient link in the Terai with Kathmandu, thus facilitating flow of goods and services.

   He appreciated the DOR, DWRI, RBN, and JICA Experts Team for their effort and dedication in successfully implementing this technical cooperation project. Sindhuli Road has been a symbol of cooperation between Japan and Nepal and will be remembered as a milestone support not only in the development road sector but also in the far-reaching cooperation and improvement of the lives and livelihood of Nepali People. Finally, he wished all the success to the 8th JCC Meeting.

5. Mr. Bindu S. Rana, Traffic Safety, JICA Expert Team, and Mr. Karna S. Khatri, Engineer, SDDSBRP, DOR presented with a brief explanation of traffic safety. The contents of their presentation focused on PDM Output and Activity related to the traffic safety, traffic survey, safety training program for schoolteachers, workshop, etc. They have further briefly explained the present issues and measures (soft and hard measures) that have been proposed based on the observation and analysis of previous traffic surveys and traffic accident records. They further made the recommendation of a traffic safety improvement plan including training programs for various user groups. Finally, they presented the road traffic safety future plan including hard measures and soft components and budgetary allocations.

6. Mr. HAYAKAWA Tomokuni, Bridge Planner, JICA Expert Team, presented the outcome of pilot projects. He briefly explained the background of project formulation by replacing the existing damaged causeways to the bridges, namely Mamti bridge, Gyampe bridge and Bhyakure bridge, the result of design including cost estimate and preparation of tender documents, output of the design manual on the Reinforced Continuous Slab Bridge (RCSB) and a workshop on the Pilot Project including training on design manual of RCSB was held on October 14-16, 2022. He also mentioned the issue of delay of work and safety issues in his presentation.

   Ms. Radhika Prajapati Shrestha, Engineer, SDDSBRP, DOR in her presentation briefly explained the DOR monitoring and supervision procedure after SROM2 by showing an organization chart. Lab assistant and supervisors will assist in supervision and quality control in addition to the current formation of SDDSBRP. She also presented the updated project status of the three bridges including the photographs. She reported that a progress review meeting was held on January 2, 2023 and contractors were instructed to submit a revised work schedule, and start work immediately and complete the work as per contract agreement.

7. Mr. NARITA Kiyoshi, Toll Road, JICA Expert Team presented on the topic of 'Recommended Plan of ETC System for the Sindhuli Road". He explained the proposed ETC system to be introduced in the Sindhuli Road, that is, the Touch & Go and Radio Frequency Identification (RFID) system, way of passing through toll booths for exempt vehicles, way of passing through toll booths for vehicles subject of toll collection and proposed two toll plazas on the Sindhuli Road. He also sorted out issues required to introduce ETC and proposed road map for realizing the introduction of ETC.

   Er. Sanu Babu Prajapati, Sr. Engineer of RBN, briefly explained the current toll collection system and issues on Sindhuli Road including toll road fees and toll collection activities, delay in monthly installment deposit by collectors, traffic congestion due to manual collection, not maintaining traffic data, disturbance by local forces, escaping trend of vehicles from the toll center, risk of accidents, disputes arise by parties and increase in operation cost, etc. Then he mentioned the importance and necessity of early introduction of ETC on BP Highway (Sindhuli Road) that proposed by JICA Expert Team. After explaining the proposed plan by JICA Expert Team to MoPIT in December 2022, MoPIT agreed with the plan and proposed to hold a stakeholder consultation meeting as soon as possible. RBN explained that they would like to ask JICA for technical assistance in introducing ETC to BP Highway.

8. Mr. SHINKAI Hiroki, the Chief Advisor of the JICA Expert Team, presented on the topic Mid/Long-term Road Maintenance Plan for the Sindhuli Road. First, he thanked all participants for their presence. Then he elaborated briefly on the content of the mid/long-terms road maintenance plan as follows

   Firstly, he pointed out that the roles and functions of the Sindhuli Road in the future transport network between Kathmand and Terai should be cralified paying attention to Kathmandu Terai Fast Track under construction with a high design standard of 4 – 6 lanes, and then advised that Sindhuli Road should serve as a complementary road to the Fast Track but not serve as a major logistics trunk road between Kathmandu and Terai. As the result, the Sindhuli Road should improve the function of traffic safety and road structural stability rather than the function of transport capacity.

Then, he presented the estimation of future traffic demands under various scenarios (1.5 lanes versus 2 lanes road) and suggested some countermeasures for each section of the Sindhuli Road against increased traffic volume in terms of traffic capacity. He pointed out the necessity of upgrading the Section I (Bardibas to Sindhulibazar) and Section IV-1 (Dhulikhel to Bakundebesi) due to the most critical in terms of traffic capacity (saturation).

He proposed various 10 activities in this mid-term road maintenance plan which included new activities using new technology that will contribute to the future operation of road maintenance and management as well as those not completed during the SROM2. In the long-term plan, he proposed upgrading of Section I and Section IV-1 (9km only to 2 lane road), 5 bridges in Section IV-2 and 12 causeways in Section III to double lane and construction of Khurkot-Chiyabari Tunnel.

Tentative implementation plan of these activities in the mid/long-term road maintenance plan proposed by JICA Expert Team is presented in **Annex 3** attached in this MM.

Subsequently, Mr. Rabindra Lal Das, the Project Manager, SDDSBRP, DOR presented the current status of road maintenance works of the Sindhuli Road and issues regarding (1) partial widening of the existing road for Section I and Section IV, (2) transfer of EIS to DOR (necessity of norms for operation and maintenance of road information board (RIB) and rain gauge stations, etc.), (3) necessity of ETC as sustainable maintenance funds from RBN, (4) road safety works focusing on vulnerable road users including pedestrians, (5) countermeasures for disaster in Kaldhunga in Section IV need closed cooperation with DWRI, (6) relocation of Sindhuli Road due to SMDP near Khurkot, (7) need of roadside facility like Road side Station (Michi–no-eki) concepts, etc.

9. Mr. IWAMARU Motoki, Deputy Chief Advisor, JICA Expert Team, and Mr. Rabindra Lal Das, the PM of SDDSBRP, DOR jointly presented on the topic Evaluation on Project Activities and Project Completion Report.

Firstly, Mr. Iwamaru explained that DOR and JICA Expert Team jointly reviewed the implementation results of the Project in December last year 2022 and evaluated the achievement of project outputs/purpose/overall goals based on the indicators mentioned in the PDM of the SROM2. The results are summarized in the Project Completion Report.

Mr. Rabindra Lal Das explained the achievement level of each output as follows.

- Output 1 [Capacity to operate and maintain the Sindhuli Road is improved.] has been observed as 'High' in achievement level.
- Output 2 [Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.] has been observed as "High to Low".
- Output 3 [Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.] has been observed as 'Fair to Poor.

Mr. Iwamaru continued the topic of achievement level from the viewpoint of Project Purpose and indicators, which were evaluated with the following observation.

- Indicator-1: A road closure caused by disasters does not continue for more than one day unless an unexpected situation happens. (50% achieved due to less data collection)
- Indicator-2: Surface distress index (SDI) on the Sindhuli Road is kept less than 2 points (in good condition) on average throughout the whole year. (75% achieved)

- Indicator-3: A cooperative framework and the division of the responsibilities between DOR and DWRI at the ministry level are institutionalized. (75% achieved)

Similarly, the prospects to achieve Overall Goal, the result observed of the following indicators are presented hereunder.

- Indicator-1: Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30% by 2023. (Achieved, as the traffic accident ratio in 2022 was reduced to 67% compared to traffic accident ratio of 2015)
- Indicator-2: Road users' satisfaction and safety management and performance in all sections reaches 4.0 points in average. (Not achieved, as the observed value was 3.53 points in average of year 2019 and 2022.)
- Indicator-3: DOR operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road effectively in cooperation with DWRI and RBN (Achieved)
- Indicator-4: DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWRI. (Achieved)

Mr. Iwamaru continued results of joint review of the implementation of the Project from the perspectives of six DAC evaluation criteria, in view of Relevance, Coherence, Effectiveness, Impact, Efficiency, and Sustainability.
The indicators for evaluating the achievement rate of each output and the evaluation results are described in the Project Completion Report.

Finally, he mentioned the recommendations for the Nepalese side for implementing activities based on Mid/Long term and maintenance plan and conclude his presentation by showing the list of products (Report, Manuals, and Handbooks etc.) produced by the Project.

10. Overall Evaluation of the Project and Closing Remarks

Mr. Ram Hari Pokharel, the Project Director, DDG, and the Chairperson of the Meeting, in his closing remarks, mentioned the following points.

- He thanked all members of the JICA Experts Team and all other Presenters for their excellent presentation.
- Being this meeting was the last JCC Meeting under SROM2, he hoped to meet in other JCC under SROM3 in future.
- He requested JICA for supporting the mid-term and long-term plans, especially technical assistance for Sindhuli Road Maintenance as SROM 3 and Khurkot-Chiyabari Tunnel in the form of either grant or soft loan format.

Finally, he thanked all participants for their active participation and closed the Meeting Session.

After a constructive discussion and having confirmation of cooperation to implement the Project, the 8th JCC meeting was closed at 13:40 PM (NST) on January 17, 2023, with the conclusion and recommendations made as presented hereunder.

C. Conclusion and Recommendation

C-1: Conclusion:

(1) Although the result of evaluation on the achievement level of the project was around 80%, the JCC Meeting confirmed that all SROM2 activities have been completed successfully as scheduled by January 2023. The Draft Project Completion Report, which was shared in draft version prior to the meeting, was briefly explained at this meeting and the JCC members agreed on the basic content. Based on this consensus, the report will be finalized and submitted after the meeting.

(2) Regarding the ongoing pilot project under the SROM2 activity, it was confirmed that DOR will make efforts to complete the construction by September 2023 as contracted.

(3) JCC members recognized necessity of introducing ETC and agreed with the plan to introduce ETC proposed by RBN as a model project on Sindhuli Road as soon as possible.

C-2: Recommendations:

The following three recommendations may be considered as further guidelines for Sindhuli Road in future.

(1) Support for the realization of Mid/Long-terms plans:
In order to effectively implement the various activities proposed in the mid-term and long-term plans, it is desired the technical and financial supports from donors as follows.

- Mid-term plan: Technical support
- Long-term plan: Grant aid for upgrading the existing 1-lane bridge to double lane bridges in Sec. III and Sec. IV, and Loan aid for construction of long tunnels in Sec. II.

(2) Jurisdiction of Sindhuli Road Office under DCID:
Since close cooperation with JICA is essential for the steady implementation of the long-term plan, it is recommended that the Sindhuli Road Office will operate and manage under the jurisdiction of DCID in close contact with JICA, until the completion of the long-term plan.

(3) Cooperative relationship scheme between DOR/DWRI/RBN:
Cooperation with RBN/DWRI/RBN should be maintained as it is until completion of long-term plan and JICA Expert Team recommends that DOR takes the initiative to hold regular meetings of the three parties about twice a year to exchange information in detail.

ANNEX 1 Participants' List

Institution	Name	Designation	Email Address
Department of Roads (DOR), Development, Cooperation Implementation Division	Mr. Ram Hari Pokharel	DDG and the Project Director (Chairperson), **JCC Member**	[redacted]
DOR, Sindhuli Road Project	Mr. Rabindra Lal Das	Project Manager	
	Ms. Radhika Prajapati Shrestha	Senior Divisional Engineer	
	Mr. Ganga Maharjan	Engineer	
	Mr. Karna Singh Khatri	Engineer	
	Mr. Madhav Poudel	Engineer	
	Mr. Gyanendra Kalauni	Engineer	
Department of Water Resources and Irrigation DWRI	Mr. Sanjeeb Baral	Deputy Director General, **JCC Member**	
	Mr. Mukesh Pathak	Senior Divisional Engineer	
	Mr. Mahesh Maharjan	Engineer	
Road Boards Nepal, RBN	Mr. Ganesh B. KC	Executive Director, **JCC Member**	
	Mr. Sagar Gnawali	Technical Director	
	Ms. Chetna Thapa	Director Administrator	
	Er. Sanu Babu Prajapati	Senior Engineer	
	Er. Dharma Raj Upadhyay	Engineer	
Embassy of Japan, EOJ	Ms. ISHIDA Miyuki	First Secretary	
JICA Nepal Office	Mr. OKUBO Akimitsu	Chief Representative, **JCC Member**	
	Mr. EHARA Yoshiki	Senior Representative	
	Ms. MAEDA Yukari	Representative	
	Mr. Sourab Rana	Senior Program Manager	
JICA Headquarters	Mr. OTA Yuki	Officer	
	Mr. KIMATA Toshio	Senior Advisor	
JICA Expert Team, Sindhuli Road Oper. & Maint. Project Phase-2 SROM2	Mr. SHINKAI Hiroki	Chief Adviser, **JCC Member**	
	Mr. IWAMARU Motoki	Deputy Chief Advisor / Road O/M Planner	
	Mr. HAYAKAWA Tomokuni	Road Structural Planner	
	Mr. Bindu S. Rana	Traffic Safety / Traffic Education / Project Coordinator	
	Mr. Ramesh P. Koirala	Road Structural Design (Causeway)	
	Mr. Akhilesh K. Karna	Road Disaster Prevention / EIS	
	Mr. NARITA Kiyoshi	Toll Road System	
	Mr. KONDO Noboru	ETC 1	
	Mr. HAYASHI Ryohei	ETC 2	
	Ms. SAGAWA Natsuko	Coordinator / Project Monitoring	
	Mr. ONOMURA Yohei	Traffic Safety Assistant	
	Mr. Santosh Rai	Secretary, Nippon Koei KTM Office	

Online

ANNEX 2 The Photographs

Photo 1. Banner of the Program (8th JCC Meeting)

Photo 2. Joint Presentation by Mr. Hayakawa and Ms. Radhika Prajapati

Photo 3. Presentation by Mr. Shinkai

Photo 4. Joint Presentation by Mr. R. L. Das and Mr. M. Iwamaru

Photo 5. Closing Remarks by DDG Mr. Ram Hari Pokharel

Photo 6. Conference Room

Photo 7. Conference Room

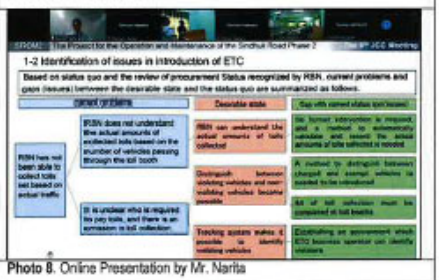


Photo 8. Online Presentation by Mr. Narita

ANNEX-3: Proposed Mid/Long-term Road Maintenance Implementation Plan of the Sindhuli Road

Plan		Activities	Implementation Plan (tentative) 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032
Mid-term Plan: 5 years 2023-2027	1	Construction of 3 bridges in Sec. IV (under construction as pilot project of SROM2)	to be completed by September 2023 as per contract
	2	Pavement overlay of the entire Sindhuli Road	
	3	Partial road widening of town and market areas in Sec. IV-2, Sec. III	
	4	**Introduction of Electric Toll Collection System (ETC)**	expect to start the operation in 2025
	5	Handover and Integration of EIS to DOR Headquarter	
	6	Digitization of road management data	
	7	Strengthening traffic safety measures (Hard/Soft)	
	8	Road relocation due to Sunkoshi Marin Diversion Project (SMDP) for around 1.0 km section near Khurkot	
	9	Countermeasures for Kaldhunga Stream in Sec. IV	
	10	Roadside facilities "Michi-no-eki"	
Long-term plan: 10 years 2023-2032	11	**Upgrading of Sec. I (Bardibas - Sindhuli Bazar) to double lane standard**	DD & Tender Construction
	12	**Upgrading of Sec. IV-1 (Dhulikhel - 9km Point) to double lane standard**	DD & Tender Construction
	13	**Upgrading of 5 bridges in Sec. IV and 12 causeways in Sec. III to double lane standard**	FS, DD & Tender Construction
	14	Construction of Khurkot - Chiyabari Tunnel	FS, DD & Tender Construction

ANNEX 5: Monitoring Sheet

Ver. 1

Project Monioring Sheet I

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal

Implementing Agency: Department of Roads (DOR), Department of Water Resources and Irrigation (DWRI) and Roads Board Nepal (RBN)

Target Group: Staff members of DOR, DWRI and RBN

Period of Project: Apr 2018 - Mar 2021 (36 months)

Project Site: Sindhuli Road

Version_1

Dated Apr.25.2019

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal The safe and smooth road traffic along the Sindhuli Road is maintained.	1. Fatality ratio per vehicle-km for the year of 2011 in all sections reduces by X% by 2023. 2. Road users' satisfaction to road maintenance and safety management and performance in all sections reaches 4.0 points in average. 3. DOR operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road effectively in cooperation with DWRI and RBN. 4. DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWRI.	1. Traffic accident report by the Sindhuli Road Maintenance Unit (SRMU)/Traffic data by the SRMU 2. Interview result of road users based on the traffic survey by the SRMU 3-1. An execution rate of road maintenance budget allocated by RBN and DOR for Sindhuli Road 3-2. Road inventory, disaster and maintenance records 3-3. Operation and maintenance records of EIS 3-4. Records of road safety countermeasures in the Road Safety Management Plan 4. Records of road disasters and road maintenance	The policy and direction on the road operation and maintenance are not drastically changed by the Government of Nepal (GON).		
Project Purpose The overall operation and maintenance system of the Sindhuli Road is strengthened.	1. A road closure caused by disasters does not continue for more than one day unless unexpected situation happens. 2. Surface distress index (SDI) on Sindhuli road keeps in less 2 point (in good condition) through a whole year. 3. A cooperative framework and the division of the responsibilities between DOR and DWRI at the Ministry level are institutionalized.	1. Road maintenance record and hazard record 2. SDI record, Disaster record, Road maintenance record, Annual Work Plan 3. Agreement between DOR and DWRI at the Ministry level	1. Road safety awareness campaign is conducted by various agencies such as Department of Transport Management, Traffic Police, media and other related agencies. 2. The budget and personnel necessary for the road operation and maintenance are to be allocated continuously.		
Outputs 1. Capacity to operate and maintain the Sindhuli Road is improved.	1-1. Routine, recurrent and periodic maintenance are conducted properly in accordance with the Annual Road Maintenance Plan (ARMP). 1-2. Specific and emergency maintenance for disaster including emergency response is conducted timely and properly. 1-3. Toll collection system is introduced in the Sindhuli Road in cooperation with DOR and RBN.	1-1-1. Maintenance budget allocated from RBN and DOR 1-1-2. An execution rate of the maintenance budget 1-1-3. Record of road maintenance work 1-2. Operation record of maintenance machineries including emergency equipment supplied by JICA 1-3. Toll collection system plan in the Sindhuli Road			
2. Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.	2-1. Emergency Information System (EIS) is operated and managed properly in sustainable manner. 2-2. Road safety management is undertaken in accordance with the Road Safety Management Plan. 2-3. Awareness and education activities of traffic safety are undertaken by using the developed education materials.	2-1. Operation and maintenance record of EIS 2-2. Road Safety Management Plan 2-3. Education materials of road safety and record of awareness and education activities			
3. Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.	3-1. The Pilot Project for restoration of the damaged causeway is undertaken and completed in cooperation with DOR and DWRI. 3-2. The Project related issues including causeway disaster countermeasures are presented by individual counterpart at the workshops and the Joint Coordinating Committee (JCC) meetings.	3-1. Implementation schedule of the pilot project 3-2. Results of seminars and workshops, a manual and training reports			

Activities	Inputs		Important Assumption
	The Japanese Side	The Nepalese Side	
1-1. Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN 1-2. Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2 1-3. Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project 1-4. Update the hazard map and road inventories of the Sindhuli Road 1-5. Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP 1-6. Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening 1-7. Conduct countermeasure works against water induced disasters beyond the right of way by DWRI 1-8. Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN 1-9. Convene regular meetings and monitoring for road operation and maintenance	1. Japanese experts - Chief advisor/Road administration - Deputy Chief Advisor/RoadO/M Planner - Road Structure Planner - Traffic safety Measure/Traffic Safety Education - Pavement Quality Control - Hydrologic Analysis/Flood Control - Road Structural Design - Road Disaster Prevention/EIS - Toll Road System/Pre-F/S of Rest Rrea - Coordination/Procurement/Social Evirmental Analysis 2. Pilot project for restoration of causeway disaster 3. Training in Japan or/and the third countries 4. In country training (technical study tour) 5. Local expenses for the Project activities	1. Counterpart Personnel (C/P) 【DOR】 - Project Director - Project Manager - Engineer - Sub-Engineer 【DWRI】 - Senior Divisional Hydrogeologist - River Disaster Expert (Civil Engineer) 【RBN】 - Senior Engineer 2. Expenses for the related Project activities and others specified in Basic Principles for Technical Cooperation 【DOR】 -Expense for operation and maintenance, and other safety measures of the Sindhuli Road 【DWRI】 -Expense for water induced disaster management works beyond the right of way 【RBN】 -Expense for introduction of the toll collection system 3. Provision of 4-WD vehicle for the site visit 4. Others	
2-1. Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents 2-2. Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan 2-3. Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users 2-4. Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local authorities 2-5. Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.) 2-6. Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities 2-7. Conduct a sharing workshop on road traffic safety 2-8. Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road			**Pre-Conditions** Most of the counterparts who were trained by the Phase 1 keep being deployed as counterparts of the Phase 2.
3-1. Conduct the site survey of the Sindhuli road and select the sites for pilot project 3-2. Conduct the natural condition surveys including EIA, topo. and geological investigations 3-3. Prepare the design, cost estimation and tender documents for the pilot project 3-4. Implementation of the pilot project in collaboration with DWRI 3-5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project 3-6. Prepare the manual about the planning, investigation and design method of the causeway rehabilitation 3-7. Conduct a sharing workshops on pilot project 3-8. Conduct a technical study tour in Nepal			**<Issues and countermeasures>**

Project Monitoring Sheet II

Version_1

Date: Apr. 25, 2019

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal

Monitoring

Inputs	Year	1st Year				2nd Year				3rd Year				Remarks	Issue	Solution
		I	II	III	IV	I	II	III	IV	I	II	III	IV			
		1 2 3	4 5 6	7 8 9	10 11 12	13 14 15	16 17 18	19 20 21	22 23 24	25 26 27	28 29 30	31 32 33	34 35 36			
Expert																
1. Chief Advisor/Road Administration	Plan															
	Actual															
2. Deputy Chief Advisor/ Road O/M Planner	Plan															
	Actual															
3. Road Structure Planner	Plan															
	Actual															
4. Traffic Safety Measures/ Traffic Safety Education	Plan															
	Actual															
5. Pavement Quality Control	Plan															
	Actual															
6. Hydrologic Analysis/ Flood Control	Plan															
	Actual															
7. Road Structural Design (Causeway)	Plan															
	Actual															
8. Road Disaster Prevention/ EIS	Plan															
	Actual															
9. Toll Road System/ Pre-F/S of Rest Area	Plan															
	Actual															
10. Coordination/ Procurement/ Social Environmental Analysis	Plan															
	Actual															
Total	Plan															
	Actual															
Equipment																
To be determined	Plan															
	Actual															
Training in Japan																
To be determined	Plan															
	Actual															
Training Tour																
To be determined	Plan															
	Actual															

Activities **Sub-Activities**	Year	1st Year				2nd Year				3rd Year				Responsible Organization		Achievements	Issue & Countermeasures
		I	II	III	IV	I	II	III	IV	I	II	III	IV	Japan	Nepal		
Output 1: Capacity to operate and maintain the Sindhuli Road is improved.																	
1.1 Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN	Plan													JICA Expert	SRMU		
	Actual																
1.2 Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2	Plan													JICA Expert	SRMU		
	Actual																
1.3 Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project	Plan													JICA Expert	SRMU, SRDMU, RBN		
	Actual																
1.4 Update the hazard map and road inventories of the Sindhuli Road	Plan													JICA Expert	SRMU		
	Actual																
1.5 Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP	Plan													JICA Expert	SRMU		
	Actual																
1.6 Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening	Plan													JICA Expert	SRMU		
	Actual																
1.7 Conduct countermeasure works against water induced disasters beyond Right of Way by DWRI	Plan													JICA Expert	SRDMU		
	Actual																
1.8 Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN	Plan													JICA Expert	SRMU, RBN		
	Actual																
1.9 Convene regular meetings and monitoring for road operation and maintenance	Plan													JICA Expert	SRMU, SRDMU, RBN		
	Actual																
Output 2: Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.																	
2.1 Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents	Plan													JICA Expert	SRMU		
	Actual																
2.2 Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan	Plan													JICA Expert	SRMU		
	Actual																
2.3 Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users	Plan													JICA Expert	SRMU		
	Actual																
2.4 Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local administration	Plan													JICA Expert	SRMU		
	Actual																
2.5 Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.)	Plan													JICA Expert	SRMU		
	Actual																
2.6 Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities	Plan													JICA Expert	SRMU		
	Actual																
2.7 Conduct a sharing workshop on road traffic safety	Plan													JICA Expert	SRMU		
	Actual																
2.8 Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road	Plan													JICA Expert	SRMU		
	Actual																
Output 3: Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.																	
3.1 Conduct the site survey of the Sindhuli road and select the sites for pilot project	Plan													JICA Expert	SRMU, SRDMU		
	Actual																
3.2 Conduct the natural condition surveys including EIA, topo. and geological investigations	Plan													JICA Expert	SRMU, SRDMU		
	Actual																
3.3 Prepare the design, cost estimation and tender documents for the pilot project including tender assistant	Plan													JICA Expert	SRMU, SRDMU		
	Actual																
3.4 Implementation of the pilot project in cooperation with DWRI	Plan													JICA Expert	SRMU, SRDMU		
	Actual																
3.5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project	Plan													JICA Expert	SRMU, SRDMU		
	Actual																
3.6 Prepare the manual about the planning, investigation and design method of the causeway rehabilitation	Plan													JICA Expert	SRMU, SRDMU		
	Actual																
3.7 Conduct a sharing workshops on pilot project	Plan													JICA Expert	SRMU, SRDMU		
	Actual																
3.8 Conduct a technical study tour in Nepal	Plan													JICA Expert	SRMU, SRDMU		
	Actual																

Duration / Phasing																	
	Plan	Phase 2-1 (18 months)						Phase 2-2 (18 months)									
	Actual																

Monitoring Plan	Year	1st Year				2nd Year				3rd Year				Remarks	Issue	Solution
		I	II	III	IV	I	II	III	IV	I	II	III	IV			
Monitoring																
Joint Coordinating Committee (JCC) Meeting	Plan	○		○			○				○					
	Actual	○														
Set-up the Detailed Plan of Operation	Plan	○														
	Actual	○														
Submission of Monitoring Sheet	Plan	○		○			○				○					
	Actual	○														
Monthly Meeting	Plan	○	○	○	○	○	○	○	○	○	○	○	○			
	Actual															
Monitoring Mission from Japan	Plan															
	Actual															
Joint Monitoring	Plan															
	Actual															
Post Monitoring	Plan															
	Actual															
Reports/Documents																
Work Plan of Phase 2	Plan	●														
	Actual															
Project Completion Report	Plan												●			
	Actual															
Public Relations																
Details to be determined	Plan															
	Actual															
	Plan															
	Actual															

SRMU: Sindhuli Road Maintenance Unit (under DOR)
SRDMU: Sindhuli Road Disaster Management Unit (under DWRI)

TO CR of JICA NEPAL OFFICE

PROJECT MONITORING SHEET Ver.1 (April 2019)

Project Title:
The Project for the Operation and Maintenance of the Sindhuli Road Phase 2
Version of the Sheet: Ver.1

Name: Arjun Jung Thapa
Title: DDG of DCID, DOR
Name: Hiroki Shinkai
Title: Chief Advisor / Road Administration
Submission Date: 7th May 2019

I. Summary

1 Progress

1-1 Progress of Inputs

(1) Experts

As of April2019

	Position	*Name*	*Plan MM*	*Accumulated MM*
1	Chief Advisor / Road Administration	Hiroki SHINKAI	14.8	1.10
2	Deputy Chief Advisor/ Road O/M Planner	Motoki IWAMARU	14.0	0.87
3	Road Structure Planner	Hiroshi FUJISAWA	8.0	1.00
4	Traffic Safety Measures/ Traffic Safety Education	Bindu Shamsher RANA	6.5	0.25
5	Pavement Quality Control	Izumi MIDORIKAWA	1.0	0.83
6	Hydrologic Analysis/ Flood Control	Khadananda LAMSAL	1.0	0.10
7	Road Structural Design	Ramesh Prasad KOIRALA	3.0	0.50
8	Road Disaster Prevention/ EIS	Akhilesh Kumar KARNA	3.5	0.25
9	Toll Road System/ Pre-F/S of Rest Area	Kiyoshi NARITA	3.5	0.00
10	Coordination/ Procurement/ Social Environmental Analysis	Keita IRINO	3.7	0.70
		Total	59.00	5.60

(2) Equipment

As of April 2019

	Item	*Quantity*	*Status*
1	Network HDD	1 set	Purchased
2	Projector	1 set	Purchased
3	Camera	1 set	Purchased
4	Multifunction printer	1 set	Purchased
5	Computer	3 set	To be purchased
6	Anti-virus software	9 set	To be purchased
7	Auto CAD LT	3 set	To be purchased
8	Acrobat	1 set	To be purchased
9	Uninterruptible power system	3 set	To be purchased
10	Inkjet Printer	1 set	To be purchased
11	Furniture	1 set	To be purchased

(3) Training in Japan

- Planning to carry out in November 2019.

(4) Training Tour in Nepal

None

1-2 Progress of Activities

- Preparing the draft of Work Plan in Japan
- Courtesy call to DOR (DG: April 4, 2019, DDG: April 12,2019), RBN (April 7, 2019), DWRI (April 4, 2019), JICA (April 18, 2019), Embassy of Japan (April 19, 2019).
- Site visit (8th~9th April 2019, 16th ~17th April 2019)
- Procurement of Topographic Survey company
- Preparing tender documents for Traffic Survey
- General Observation for Pavement, EIS, IEE of Sindhuli Road

1-3 Achievement of Output

1st JCC Meeting was held on April ,2019 at the conference room of DOR.

Attendance:

1. Mr. Arjun Jung Thapa, Deputy Director General, DOR (Chairperson)
2. Mr. Pradeep Thapa, Deputy Director General, DWRI
3. Er. Krishna Singh Basnet, Executive Director, RBN
4. Mr. Surya Bahadar Bhat, Project Manager, Sindhuli Road Project Office
5. Ms. Yumiko Asakuma, Chief Representative, JICA Nepal Office
6. Mr. Yoshimi Sando, 2nd Secretary, Embassy of Japan

7. Mr. Hiroki Shinkai, Chief Advisor, and other JICA expert members
8. Other counterpart members

1-4 Achievement of the Project Purpose

・None

1-5 Changes of Risks and Actions for Mitigation

・None

1-6 Progress of Actions undertaken by JICA

・None

1-7 Progress of Actions undertaken by Gov. of Nepal

・None

1-8 Progress of Environmental and Social Considerations (if applicable)

・None

1-9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

・None

1-10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

・None

2 Delay of Work Schedule and/or Problems (if any)

2-1 Detail

2-2 Cause

2-3 Action to be taken

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Nepal, etc.)

(1) With regard to the implementation of the pilot project conducted with JICA funds, the roles of JICA, DOR, DWRI and JICA experts were clarified and confirmed in the Minutes of Meeting.

(2) JICA requested DOR and DWRI to take the necessary processes of transferring ownership at own cost from JICA blue number plate to Government white number plate of three vehicles which were handed over to DOR and DWRI by the Project for Operation and Maintenance of the Sindhuli Road (Phase 1).

3 Modification of the Project Implementation Plan

3-1 PO

(1) With the addition of pavement specialists, the total number of JICA experts became 10 people.
(2) The position names of some of the Japanese experts have changed, but the technical expertise remains the same.

3-2 Other modifications on detailed implementation plan

(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)

4　Preparation of Gov. of Nepal toward after completion of the Project

II. Project Monitoring Sheet I & II　*as Attached*

Ver. 2

Project Monioring Sheet I

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal

Implementing Agency: Department of Roads (DOR), Department of Water Resources and Irrigation (DWRI) and Roads Board Nepal (RBN)

Target Group: Staff members of DOR, DWRI and RBN

Period of Project: Apr 2018 - Mar 2021 (36 months)

Project Site: Sindhuli Road

Version_2

Dated Oct.9. 2019

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal The safe and smooth road traffic along the Sindhuli Road is maintained.	1. Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023. 2. Road users' satisfaction to road maintenance and safety management and performance in all sections reaches 4.0 points in average. 3. DOR operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road effectively in cooperation with DWRI and RBN. 4. DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWRI.	1. Traffic accident report by the Sindhuli Road Maintenance Unit (SRMU)/Traffic data by the SRMU 2. Interview result of road users based on the traffic survey by the SRMU 3-1. An execution rate of road maintenance budget allocated by RBN and DOR for Sindhuli Road 3-2. Road inventory, disaster and maintenance records 3-3. Operation and maintenance records of EIS 3-4. Records of road safety countermeasures in the Road Safety Management Plan 4. Records of road disasters and road maintenance	The policy and direction on the road operation and maintenance are not drastically changed by the Government of Nepal (GON).	Set a target indicator that was not yet determined	
Project Purpose The overall operation and maintenance system of the Sindhuli Road is strengthened.	1. A road closure caused by disasters does not continue for more than one day unless unexpected situation happens. 2. Surface distress index (SDI) on Sindhuli road keeps in less 2 point (in good condition) through a whole year. 3. A cooperative framework and the division of the responsibilities between DOR and DWRI at the Ministry level are institutionalized.	1. Road maintenance record and hazard record 2. SDI record, Disaster record, Road maintenance record, Annual Work Plan 3. Agreement between DOR and DWRI at the Ministry level	1. Road safety awareness campaign is conducted by various agencies such as Department of Transport Management, Traffic Police, media and other related agencies. 2. The budget and personnel necessary for the road operation and maintenance are to be allocated continuously.		
Outputs 1. Capacity to operate and maintain the Sindhuli Road is improved.	1-1. Routine, recurrent and periodic maintenance are conducted properly in accordance with the Annual Road Maintenance Plan (ARMP). 1-2. Specific and emergency maintenance for disaster including emergency response is conducted timely and properly. 1-3. Toll collection system is introduced in the Sindhuli Road in cooperation with DOR and RBN.	1-1-1. Maintenance budget allocated from RBN and DOR 1-1-2. An execution rate of the maintenance budget 1-1-3. Record of road maintenance work 1-2. Operation record of maintenance machineries including emergency equipment supplied by JICA 1-3. Toll collection system plan in the Sindhuli Road			
2. Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.	2-1. Emergency Information System (EIS) is operated and managed properly in sustainable manner. 2-2. Road safety management is undertaken in accordance with the Road Safety Management Plan. 2-3. Awareness and education activities of traffic safety are undertaken by using the developed education materials.	2-1. Operation and maintenance record of EIS 2-2. Road Safety Management Plan 2-3. Education materials of road safety and record of awareness and education activities			
3. Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.	3-1. The Pilot Project for restoration of the damaged causeway is undertaken and completed in cooperation with DOR and DWRI. 3-2. The Project related issues including causeway disaster countermeasures are presented by individual counterpart at the workshops and the Joint Coordinating Committee (JCC) meetings.	3-1. Implementation schedule of the pilot project 3-2. Results of seminars and workshops, a manual and training reports			

Activities	Inputs		Important Assumption
	The Japanese Side	**The Nepalese Side**	
1-1. Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN 1-2. Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2 1-3. Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project 1-4. Update the hazard map and road inventories of the Sindhuli Road 1-5. Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP 1-6. Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening 1-7. Conduct countermeasure works against water induced disasters beyond the right of way by DWRI 1-8. Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN 1-9. Convene regular meetings and monitoring for road operation and maintenance	1. Japanese experts - Chief advisor/Road administration - Deputy Chief Advisor/RoadO/M Planner - Road Structure Planner - Traffic safety Measure/Traffic Safety Education - Pavement Quality Control - Hydrologic Analysis/Flood Control - Road Structural Design - Road Disaster Prevention/EIS - Toll Road System/Pre-F/S of Rest Rrea - Coordination/Procurement/Social Evirmental Analysis 2. Pilot project for restoration of causeway disaster 3. Training in Japan or/and the third countries 4. In country training (technical study tour) 5. Local expenses for the Project activities	1. Counterpart Personnel (C/P) 【DOR】 - Project Director - Project Manager - Engineer - Sub-Engineer 【DWRI】 - Senior Divisional Hydrogeologist - River Disaster Expert (Civil Engineer) 【RBN】 - Senior Engineer 2. Expenses for the related Project activities and others specified in Basic Principles for Technical Cooperation 【DOR】 -Expense for operation and maintenance, and other safety measures of the Sindhuli Road 【DWRI】 -Expense for water induced disaster management works beyond the right of way 【RBN】 -Expense for introduction of the toll collection system 3. Provision of 4-WD vehicle for the site visit 4. Others	
2-1. Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents 2-2. Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan 2-3. Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users 2-4. Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local authorities 2-5. Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.) 2-6. Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities 2-7. Conduct a sharing workshop on road traffic safety 2-8. Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road			**Pre-Conditions** Most of the counterparts who were trained by the Phase 1 keep being deployed as counterparts of the Phase 2.
3-1. Conduct the site survey of the Sindhuli road and select the sites for pilot project 3-2. Conduct the natural condition surveys including EIA, topo. and geological investigations 3-3. Prepare the design, cost estimation and tender documents for the pilot project 3-4. Implementation of the pilot project in collaboration with DWRI 3-5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project 3-6. Prepare the manual about the planning, investigation and design method of the causeway rehabilitation 3-7. Conduct a sharing workshops on pilot project 3-8. Conduct a technical study tour in Nepal			**<Issues and countermeasures>**

Project Monitoring Sheet II

Version_2　　**Dated Oct.9. 2019**

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal

Monitoring

Inputs	Year	1st Year: 2019/2020				2nd Year: 2020/2021				3rd Year: 2021/2022				Remarks	Issue	Solution
		I	II	III	IV	I	II	III	IV	I	II	III	IV			
		4 5 6	7 8 9	10 11 12	1 2 3	4 5 6	7 8 9	10 11 12	1 2 3	4 5 6	7 8 9	10 11 12	1 2 3			
Expert																
1. Chief Advisor/Road Administration	Plan															
	Actual															
2. Deputy Chief Advisor/ Road O/M Planner	Plan															
	Actual															
3. Road Structure Planner	Plan															
	Actual															
4. Traffic Safety Measures/ Traffic Safety Education	Plan															
	Actual															
5. Pavement Quality Control	Plan															
	Actual															
6. Hydrologic Analysis/ Flood Control	Plan															
	Actual															
7. Road Structural Design (Causeway)	Plan															
	Actual															
8. Road Disaster Prevention/ EIS	Plan															
	Actual															
9. Toll Road System/ Pre-F/S of Rest Area	Plan															
	Actual															
10. Coordination/ Procurement/ Social Environmental Analysis	Plan															
	Actual															
Total	Plan															
	Actual															
Equipment																
To be determined	Plan															
	Actual															
Training in Japan																
November 3 – November 16, 2019. (14 days)	Plan														Final participants list shall be confirmed	"Application Form" is to be submitted to JICA by 4th Oct.
	Actual															
Training Tour																
To be determined	Plan															
	Actual															

Activities / Sub-Activities	Year	1st Year				2nd Year				3rd Year				Responsible Organization		Achievements	Issue & Countermeasures
		I	II	III	IV	I	II	III	IV	I	II	III	IV	Japan	Nepal		
Output 1: Capacity to operate and maintain the Sindhuli Road is improved.																	
1.1 Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN	Plan													JICA Expert	SRMU	Work Plan was confirmed	
	Actual																
1.2 Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2	Plan													JICA Expert	SRMU	Annual allocated budget was confirmed	Detailed schedule and budget allocation are to be discussed
	Actual																
1.3 Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project	Plan													JICA Expert	SRMU, SRDMU, RBN		
	Actual																
1.4 Update the hazard map and road inventories of the Sindhuli Road	Plan													JICA Expert	SRMU		
	Actual																
1.5 Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP	Plan													JICA Expert	SRMU	Various maintenance works are On-Going	
	Actual																
1.6 Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening	Plan													JICA Expert	SRMU	Overlay Works are On-Going	
	Actual																
1.7 Conduct countermeasure works against water induced disasters beyond Right of Way by DWRI	Plan													JICA Expert	SRDMU		
	Actual																
1.8 Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN	Plan													JICA Expert	SRMU, RBN	Toll Road was introduced from 18 Sep.	Monitoring
	Actual																
1.9 Convene regular meetings and monitoring for road operation and maintenance	Plan													JICA Expert	SRMU, SRDMU, RBN	Held monthly meeting and joint site patrol	
	Actual																
Output 2: Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.																	
2.1 Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents	Plan													JICA Expert	SRMU	Collected the accident record from 2011 to 2018	
	Actual																
2.2 Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan	Plan													JICA Expert	SRMU	Review the current progress of road safety measures. Guard-rail installation is On-Going	
	Actual																
2.3 Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users	Plan													JICA Expert	SRMU	Determined the candidate location of additional EIS	
	Actual																
2.4 Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local administration	Plan													JICA Expert	SRMU		
	Actual																
2.5 Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.)	Plan													JICA Expert	SRMU	Traffic Survey was conducted in June 2019	
	Actual																
2.6 Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities	Plan													JICA Expert	SRMU	Schools are selected and education materials are in process	
	Actual																
2.7 Conduct a sharing workshop on road traffic safety	Plan													JICA Expert	SRMU		
	Actual																
2.8 Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road	Plan													JICA Expert	SRMU	Concept and candidate site was established	
	Actual																
Output 3: Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.																	
3.1 Conduct the site survey of the Sindhuli road and select the sites for pilot project	Plan													JICA Expert	SRMU, SRDMU	Target site was confirmed	
	Actual																
3.2 Conduct the natural condition surveys including EIA, topo. and geological investigations	Plan													JICA Expert	SRMU, SRDMU	Topographic and geological surveys were conducted	
	Actual																
3.3 Prepare the design, cost estimation and tender documents for the pilot project including tender assistant	Plan													JICA Expert	SRMU, SRDMU	Preliminary evaluation was prepared	
	Actual																
3.4 Implementation of the pilot project in cooperation with DWRI	Plan													JICA Expert	SRMU, SRDMU		
	Actual																
3.5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project	Plan													JICA Expert	SRMU, SRDMU	Discussion on the design criteria was held	
	Actual																
3.6 Prepare the manual about the planning, investigation and design method of the causeway rehabilitation	Plan													JICA Expert	SRMU, SRDMU		
	Actual																
3.7 Conduct a sharing workshops on pilot project	Plan													JICA Expert	SRMU, SRDMU		
	Actual																
3.8 Conduct a technical study tour in Nepal	Plan													JICA Expert	SRMU, SRDMU		
	Actual																
Duration / Phasing	Plan	Phase 2-1 (18 months)								Phase 2-2 (18 months)							
	Actual																

Monitoring Plan	Year	1st Year: 2019/2020				2nd Year: 2020/2021				3rd Year: 2021/2022				Remarks	Issue	Solution
		I	II	III	IV	I	II	III	IV	I	II	III	IV			
Monitoring																
Joint Coordinating Committee (JCC) Meeting	Plan	✓		✓		✓		✓		✓		✓			Next JCC Meeting is the end of March 2020	
	Actual	✓		✓												
Set-up the Detailed Plan of Operation	Plan	✓														
	Actual	✓														
Submission of Monitoring Sheet	Plan	✓		✓		✓		✓		✓		✓				MS ver.2 will be submitted on 2 Oct.
	Actual	✓														
Monthly Meeting	Plan	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓		None	
	Actual	✓ ✓	✓ ✓	✓												
Monitoring Mission from Japan	Plan															
	Actual															
Joint Monitoring	Plan															
	Actual															
Post Monitoring	Plan															
	Actual															
Reports/Documents																
Work Plan of Phase 2	Plan	✓													None	
	Actual	✓														
Project Completion Report	Plan												✓			
	Actual															
Public Relations																
Details to be determined	Plan															
	Actual															
	Plan															
	Actual															

SRMU: Sindhuli Road Maintenance Unit (under DOR)

SRDMU: Sindhuli Road Disaster Management Unit (under DWRI)

TO CR of JICA NEPAL OFFICE

PROJECT MONITORING SHEET Ver.2 (October 2019)

Project Title:
The Project for the Operation and Maintenance of the Sindhuli Road Phase 2
Version of the Sheet: Ver.2

Name: Arjun Jung Thapa
Title: DDG of DCID, DOR
Name: Hiroki Shinkai
Title: Chief Advisor / Road Administration
Submission Date: 9th Oct 2019

I. Summary

1 Progress

1-1 Progress of Inputs

(1) Experts

As of March, 2020

	Position	*Name*	*Plan MM*	*Accumulated MM*
1	Chief Advisor / Road Administration	Hiroki SHINKAI	14.8	6.77
2	Deputy Chief Advisor/ Road O/M Planner 1	Motoki IWAMARU	14.0	6.00
3	Road Structure Planner	Hiroshi FUJISAWA	14.0	9.40
4	Traffic Safety Measures/ Traffic Safety Education	Bindu Shamsher RANA	6.5	3.00
5	Pavement Quality Control	Izumi MIDORIKAWA	5.0	3.20
6	Hydrologic Analysis/ Flood Control	Khadananda LAMSAL	1.0	1.00
7	Road Structural Design	Ramesh Prasad KOIRALA	6.1	3.50
8	Road Disaster Prevention/ EIS	Akhilesh Kumar KARNA	3.5	2.50
9	Toll Road System/ Pre-F/S of Rest Area	Kiyoshi NARITA	3.5	1.70
10	Coordination/ Procurement/ Social Environmental Analysis	Keita IRINO	2.7	1.00
11	Road O/M Planner 2	Hikaru Tanaka	1.0	1.00
		Total	72.10	39.07

(2) Equipment

As of September, 2019

	Item	Quantity	Status
1	Network HDD	1 set	Purchased
2	Projector	1 set	Purchased
3	Camera	1 set	Purchased
4	Multifunction printer	1 set	Purchased
5	Computer	3 set	Purchased
6	Anti-virus software	9 set	To be purchased
7	Auto CAD LT	3 set	To be purchased
8	Acrobat	1 set	To be purchased
9	Uninterruptible power system	3 set	To be purchased
10	Inkjet Printer	1 set	To be purchased
11	Furniture	1 set	To be purchased

(3) Training in Japan

- Date: November 3 – November 16, 2019 (14 days)
- Participant: DOR 6, RBN 2, DWRI 1 (Total 9)
- Program:
  - Toll road system & toll collection system
  - Traffic safety and emergency facilities
  - Road disaster prevention / countermeasure technology (incl. frontier technology such as AI and VR)
  - Infrastructure maintenance technology and asset management
  - Pavement technology
  - Contract management of maintenance work
  - Long mountainous tunnel construction technology
  - Preparation of the action plan and presentation

(4) Training Tour in Nepal

None

1-2 Progress of Activities

(1) Progress of Activities for Output - 1

- Annual budget allocation for FY2019/2020 was reported by DOR.
- Various maintenance works such as routine, recurrent, periodic, specific, and emergency are On-Going.
- Overlay works for Sec.IV are On-Going.
- RBN has decided to start toll collection to the Sindhuli Road.
- Held monthly meeting and joint site patrol regularly.

(2) Progress of Activities for Output - 2

- Currently none of the Road Information Boards of EIS was being updated, and it needs to update and popularize the EIS web site so that users can get update regarding the road situation.

- Traffic accident record from 2011 to 2018 was collected through traffic police. Analyzation of it is processing.
- Guard rail installation works are in process.
- Preparation of education materials are in process.
- Concept and candidate site of Rest Area were proposed near the Khurkot bus terminal.

(3) Progress of Activities for Output - 3

- Through the series of discussion among DOR, JICA and the JET, implementing conditions of the Pilot Projects for restoration of damaged causeways was confirmed, and all concerned party have signed the Minutes of Meeting in 26th September 2019. JET will provide technical assistance in the form of soft component and training component, which is expected to contribute to the sustainability of the project impact.

1-3 Achievement of Output

(1) Achievement of Output - 1

- Work Plan was confirmed among the JET and C/Ps.
- Annual allocated budget in ARMP was confirmed.
- Toll collection started from 18 Sep. in separate 2 sections of Dhulikhel - Khurkot and Khurkot - Bardibas by DOR on behalf of contractors which are to be procured by RBN. Introduction of toll road system was in accordance with the government policy.

(2) Achievement of Output - 2

- 35 Schools along the Sindhuli Road are identified.
- Additional EIS location was determined as 2 places in Khurkot.
- First traffic survey was conducted in June 2019.

No.	Survey items	Contents
1	Traffic Count	• Road side count @ 6 locations • 24 hrs / 2 weekdays & 1 weekend
2	Origin-Destination	• Interviewing @ 3 locations • 6:00 – 22:00 / 1 weekday
3	Travel Speed	• Measuring travel time • 2 routes (BP Hw. vs. Prithivi Hw.)

(3) Achievement of Output - 3

- Target site and structure type was determined as below

No.	Candidate Sites		Selected Type of Bridge
1	STA. 1+400	Ghyampe bridge	PC Post-tensioned T-girder (cast-in-situ) Bridge (40m)
2	STA. 3+900	Mamti bridge	RC continuous Slab (cast-in-situ) Bridge (40m)
3	STA. 9+700	Bhyakure bridge	PC Post-tensioned T-girder (cast-in-situ) Bridge (40m)

- Topographic and geological surveys were conducted

- Preliminary evaluation was completed

1-4 Achievement of the Project Purpose

- In-progress toward achievement of the project purpose.

1-5 Changes of Risks and Actions for Mitigation

- Sunkosi Marin Diversion Multipurpose Project

According to the explanation on 2nd JCC meeting about Sunkosi Marin Diversion Multipurpose Project (SMDMP) which was started by DWRI, it is to be assumed that some part of Sindhuli Road comes under inundation permanently after construction of this project. To maintain the sufficient functions of the Sindhuli Road, proper detour road planning and design is required. JET will advise DWRI to hold necessary discussion with DOR.

- Road Widening

DOR is planning to widen the width of the road at each section, and request for technical assistance was made to JET. After the consultation with JICA, JET replied to DOR that hasty road widening was not recommended, and DOR should plan it with the priority as follows;

- Priority1: Section1 (Relatively easier to widen the road than other section, but the part should be limited)
- Priority2: Section4 (The Project will provide technical assistance for partial widening for traffic safety)
- Priority3: Section 2 &3 (Technically difficult, so it must be thoroughly examined before proceeding)

1-6 Progress of Actions undertaken by JICA

- None

1-7 Progress of Actions undertaken by Gov. of Nepal

- None

1-8 Progress of Environmental and Social Considerations (if applicable)

- None

1-9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

- None

1-10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

- The revision of the JICA Expert assignment schedule was proposed and accepted. The schedule of sub-activities will be revised accordingly.

2 Delay of Work Schedule and/or Problems (if any)

2-1 Detail

- None

2-2 Cause

- None

2-3 Action to be taken

- None

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Nepal, etc.)

- With regard to the implementation of the pilot project conducted with DOR funds, the roles of JICA, DOR, DWRI and JICA experts were clarified and confirmed in the Minutes of Meeting.

3 Modification of the Project Implementation Plan

3-1 PO

- None.

3-2 Other modifications on detailed implementation plan

- One of "Objectively Verifiable Indicators" of the project overall goal that had been not yet determined is established with mutual confirmation as "Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023".

(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)

4 Preparation of Gov. of Nepal toward after completion of the Project

II. Project Monitoring Sheet I & II *as Attached*

III. Reference Documents

1. Technical report (draft) on the examination for introduction of toll road system in Sindhuli Road
2. Technical report on major improvement items required for overlay pavement
3. Preliminary evaluation and design report for the pilot project
4. Preliminary survey report on priority section (Ch.0+400 – 7+000) in Sec. I

Ver. 3

Project Monioring Sheet I

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal
Implementing Agency: Department of Roads (DOR), Department of Water Resources and Irrigation (DWRI) and Roads Board Nepal (RBN)
Target Group: Staff members of DOR, DWRI and RBN
Period of Project: Apr 2019 - Jan 2021 (34 months)
Project Site: Sindhuli Road

Version_3
Dated Apr.24. 2020

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
The safe and smooth road traffic along the Sindhuli Road is maintained.	1. Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023.	1. Traffic accident report by the Sindhuli Road Maintenance Unit (SRMU)/Traffic data by the SRMU	The policy and direction on the road operation and maintenance are not drastically changed by the Government of Nepal (GON).	Set a target indicator that was not yet determined (Ver.2)	Project activities are being suspended due to impact of COVID-19. Discussions for further activity are required after return normal.
	2. Road users' satisfaction to road maintenance and safety management and performance in all sections reaches 4.0 points in average.	2. Interview result of road users based on the traffic survey by the SRMU		-	
	3. DOR operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road effectively in cooperation with DWRI and RBN.	3-1. An execution rate of road maintenance budget allocated by RBN and DOR for Sindhuli Road		-	
		3-2. Road inventory, disaster and maintenance records		-	
		3-3. Operation and maintenance records of EIS		-	
		3-4. Records of road safety countermeasures in the Road Safety Management Plan		-	
	4. DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWRI.	4. Records of road disasters and road maintenance		-	
Project Purpose					
The overall operation and maintenance system of the Sindhuli Road is strengthened.	1. A road closure caused by disasters does not continue for more than one day unless unexpected situation happens.	1. Road maintenance record and hazard record	1. Road safety awareness campaign is conducted by various agencies such as Department of Transport Management, Traffic Police, media and other related agencies.	-	
	2. Surface distress index (SDI) on Sindhuli road keeps in less 2 point (in good condition) through a whole year.	2. SDI record, Disaster record, Road maintenance record, Annual Work Plan			
	3. A cooperative framework and the division of the responsibilities between DOR and DWRI at the Ministry level are institutionalized.	3. Agreement between DOR and DWRI at the Ministry level	2. The budget and personnel necessary for the road operation and maintenance are to be allocated continuously.		
Outputs					
1. Capacity to operate and maintain the Sindhuli Road is improved.	1-1. Routine, recurrent and periodic maintenance are conducted properly in accordance with the Annual Road Maintenance Plan (ARMP).	1-1-1. Maintenance budget allocated from RBN and DOR 1-1-2. An execution rate of the maintenance budget 1-1-3. Record of road maintenance			
	1-2. Specific and emergency maintenance for disaster including emergency response is conducted timely and properly.	1-2. Operation record of maintenance machineries including emergency equipment supplied by JICA			
	1-3. Toll collection system is introduced in the Sindhuli Road in cooperation with DOR and RBN.	1-3. Toll collection system plan in the Sindhuli Road		Toll collection was started from Sep. 2019	
2. Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.	2-1. Emergency Information System (EIS) is operated and managed properly in sustainable manner.	2-1. Operation and maintenance record of EIS			
	2-2. Road safety management is undertaken in accordance with the Road Safety Management Plan.	2-2. Road Safety Management Plan			
	2-3. Awareness and education activities of traffic safety are undertaken by using the developed education materials.	2-3. Education materials of road safety and record of awareness and education activities			
3. Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.	3-1. The Pilot Project for restoration of the damaged causeway is undertaken and completed in cooperation with DOR and	3-1. Implementation schedule of the pilot project			
	3-2. The Project related issues including causeway disaster countermeasures are presented by individual counterpart at the workshops and the Joint Coordinating Committee (JCC) meetings	3-2. Results of seminars and workshops, a manual and training reports			

Activities	Inputs		Important Assumption
	The Japanese Side	The Nepalese Side	
1-1. Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN 1-2. Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2 1-3. Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project 1-4. Update the hazard map and road inventories of the Sindhuli Road 1-5. Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP 1-6. Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening 1-7. Conduct countermeasure works against water induced disasters beyond the right of way by DWRI 1-8. Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN 1-9. Convene regular meetings and monitoring for road operation and maintenance	1. Japanese experts - Chief advisor/Road administration - Deputy Chief Advisor/RoadO/M Planner - Road Structure Planner - Traffic safety Measure/Traffic Safety Education - Pavement Quality Control - Hydrologic Analysis/Flood Control - Road Structural Design - Road Disaster Prevention/EIS - Toll Road System/Pre-F/S of Rest Rrea - Coordination/Procurement/Social Evirmental Analysis 2. Pilot project for restoration of causeway disaster 3. Training in Japan or/and the third countries 4. In country training (technical study tour) 5. Local expenses for the Project activities	1. Counterpart Personnel (C/P) 【DOR】 - Project Director - Project Manager - Engineer - Sub-Engineer 【DWRI】 - Senior Divisional Hydrogeologist - River Disaster Expert (Civil Engineer) 【RBN】 - Senior Engineer 2. Expenses for the related Project activities and others specified in Basic Principles for Technical Cooperation 【DOR】 -Expense for operation and maintenance, and other safety measures of the Sindhuli Road 【DWRI】 -Expense for water induced disaster management works beyond the right of way 【RBN】 -Expense for introduction of the toll collection system 3. Provision of 4-WD vehicle for the site visit 4. Others	
2-1. Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents 2-2. Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan 2-3. Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users 2-4. Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local authorities 2-5. Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.) 2-6. Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities 2-7. Conduct a sharing workshop on road traffic safety 2-8. Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road			**Pre-Conditions** Most of the counterparts who were trained by the Phase 1 keep being deployed as counterparts of the Phase 2.
3-1. Conduct the site survey of the Sindhuli road and select the sites for pilot project 3-2. Conduct the natural condition surveys including EIA, topo. and geological investigations 3-3. Prepare the design, cost estimation and tender documents for the pilot project 3-4. Implementation of the pilot project in collaboration with DWRI 3-5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project 3-6. Prepare the manual about the planning, investigation and design method of the causeway rehabilitation 3-7. Conduct a sharing workshops on pilot project 3-8. Conduct a technical study tour in Nepal			**<Issues and countermeasures>**

Project Monitoring Sheet II

Version_3　　Dated Apr.24. 2020

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal

Inputs	Year	1st Year: 2019/2020				2nd Year: 2020/2021				3rd Year: 2021/2022				Remarks	Monitoring: Issue	Monitoring: Solution
		I	II	III	IV	I	II	III	IV	I	II	III	IV			
		4 5 6	7 8 9	10 11 12	1 2 3	4 5 6	7 8 9	10 11 12	1 2 3	4 5 6	7 8 9	10 11 12	1 2 3			
Expert																
1. Chief Advisor/Road Administration	Plan															
	Actual															
2. Deputy Chief Advisor/ Road O/M Planner 1	Plan															
	Actual															
3. Road Structure Planner	Plan													Input MM was extended		
	Actual															
4. Traffic Safety Measures/ Traffic Safety Education	Plan															
	Actual															
5. Pavement Quality Control	Plan															
	Actual															
6. Hydrologic Analysis/ Flood Control	Plan															
	Actual															
7. Road Structural Design (Causeway)	Plan															
	Actual															
8. Road Disaster Prevention/ EIS	Plan															
	Actual															
9. Toll Road System/ Pre-F/S of Rest Area	Plan															
	Actual															
10. Coordination/ Procurement/ Social Environmental Analysis	Plan													To be replaced		
	Actual															
11. Road O/M Planner 2	Plan													New expert added		
	Actual															
Total	Plan															
	Actual															
Equipment																
To be determined	Plan															
	Actual															
Training in Japan																
November 3 – November 16, 2019. (14 days)	Plan													Completed successfully		
	Actual															
Training Tour																
To be determined	Plan															
	Actual															

Activities / Sub-Activities	Year	1st Year				2nd Year				3rd Year				Responsible Organization: Japan	Responsible Organization: Nepal	Achievements	Issue & Countermeasures
		I	II	III	IV	I	II	III	IV	I	II	III	IV				
Output 1: Capacity to operate and maintain the Sindhuli Road is improved.																	
1.1 Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN	Plan													JICA Expert	SRMU	Work Plan was confirmed	
	Actual																
1.2 Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2	Plan													JICA Expert	SRMU	Annual allocated budget for 2019/2020 was confirmed	Budget consuption progress is to be discussed
	Actual																
1.3 Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project	Plan													JICA Expert	SRMU, SRDMU, RBN		
	Actual																
1.4 Update the hazard map and road inventories of the Sindhuli Road	Plan													JICA Expert	SRMU		
	Actual																
1.5 Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP	Plan													JICA Expert	SRMU	Various maintenance works are On-Going	
	Actual																
1.6 Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening	Plan													JICA Expert	SRMU	Overlay work is on-going. Basic plan of partial widening is established.	
	Actual																
1.7 Conduct countermeasure works against water induced disasters beyond Right of Way by DWRI	Plan													JICA Expert	SRDMU	Target site selection is in progress	
	Actual																
1.8 Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN	Plan													JICA Expert	SRMU, RBN	Toll system was introduced while contractor procurement is remained	Retender with revising traffic volume assumption
	Actual																
1.9 Convene regular meetings and monitoring for road operation and maintenance	Plan													JICA Expert	SRMU, SRDMU, RBN	Held monthly meeting and joint site patrol	
	Actual																
Output 2: Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.																	
2.1 Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents	Plan													JICA Expert	SRMU	Collected the accident record from 2011 to 2019	Checking accuracy and analyzing data of 2019
	Actual																
2.2 Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan	Plan													JICA Expert	SRMU	Overall improvement planning are in progress. Concrete block installation and painting works are On-Going	Safety instrument installation should be proceeded based on its prioritization.
	Actual																
2.3 Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users	Plan													JICA Expert	SRMU	Determined the candidate location of additional EIS	Maintenance contract should be processed and handover plan should be determined
	Actual																
2.4 Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local administration	Plan													JICA Expert	SRMU		
	Actual																
2.5 Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.)	Plan													JICA Expert	SRMU	Traffic Survey was conducted in June 2019	
	Actual																
2.6 Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities	Plan													JICA Expert	SRMU	Target schools are selected and education material preparation is in progress	Flamework and schedule of activities should be determined.
	Actual																
2.7 Conduct a sharing workshop on road traffic safety	Plan													JICA Expert	SRMU		
	Actual																
2.8 Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road	Plan													JICA Expert	SRMU	Concept and candidate site was established	
	Actual																
Output 3: Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.																	
3.1 Conduct the site survey of the Sindhuli road and select the sites for pilot project	Plan													JICA Expert	SRMU, SRDMU	Target site was confirmed	
	Actual																
3.2 Conduct the natural condition surveys including EIA, topo. and geological investigations	Plan													JICA Expert	SRMU, SRDMU	Topographic and geological surveys were conducted	
	Actual																
3.3 Prepare the design, cost estimation and tender documents for the pilot project including tender assistant	Plan													JICA Expert	SRMU, SRDMU	Design and cost estimation is almost completed	Tender documents will be finalized in two month.
	Actual																
3.4 Implementation of the pilot project in cooperation with DWRI	Plan													JICA Expert	SRMU, SRDMU	Confimed that DWRI will conduct river training.	
	Actual																
3.5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project	Plan													JICA Expert	SRMU, SRDMU	Discussion on the detailed design was held	
	Actual																
3.6 Prepare the manual about the planning, investigation and design method of the causeway rehabilitation	Plan													JICA Expert	SRMU, SRDMU	Under planning	
	Actual																
3.7 Conduct a sharing workshops on pilot project	Plan													JICA Expert	SRMU, SRDMU		
	Actual																
3.8 Conduct a technical study tour in Nepal	Plan													JICA Expert	SRMU, SRDMU		
	Actual																

Duration / Phasing		Phase 2-1 (18 months)	Phase 2-2 (18 months)
	Plan		
	Actual		

Monitoring Plan	Year	1st Year: 2019/2020				2nd Year: 2020/2021				3rd Year: 2021/2022				Remarks	Issue	Solution
		I	II	III	IV	I	II	III	IV	I	II	III	IV			
Monitoring																
Joint Coordinating Committee (JCC) Meeting	Plan	✓		✓	✓	✓		✓	✓		✓		✓		The 3rd JCC was cancelled.	Discuss about next JCC after return normal
	Actual	✓		✓												
Set-up the Detailed Plan of Operation	Plan	✓														
	Actual	✓														
Submission of Monitoring Sheet	Plan	✓		✓	✓	✓		✓	✓		✓		✓		To be confirmed by remote communication	MS ver.3 will be submitted in Apr 2020
	Actual	✓		✓	✓											
Monthly Meeting	Plan	✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓		Held only month that mojor experts are staying	
	Actual	✓ ✓	✓ ✓ ✓	✓	✓ ✓											
Monitoring Mission from Japan	Plan															
	Actual															
Joint Monitoring	Plan															
	Actual															
Post Monitoring	Plan															
	Actual															
Reports/Documents																
Work Plan of Phase 2	Plan	✓													None	
	Actual	✓														
Project Completion Report	Plan												✓			
	Actual															
Public Relations																
Details to be determined	Plan															
	Actual															
	Plan															
	Actual															

SRMU: Sindhuli Road Maintenance Unit (under DOR)

SRDMU: Sindhuli Road Disaster Management Unit (under DWRI)

TO CR of JICA NEPAL OFFICE

PROJECT MONITORING SHEET Ver.3 (Apr. 2020)

Project Title:
The Project for the Operation and Maintenance of the Sindhuli Road Phase 2
Version of the Sheet: Ver.3

Name: Arjun Jung Thapa
Title: DDG of DCID, DOR
Name: Hiroki Shinkai
Title: Chief Advisor / Road Administration
Submission Date: 24th April 2020

I. Summary

1 Progress

1-1 Progress of Inputs

(1) Experts

As of 31st March, 2020

	Position	Name	Plan MM	Accumulated MM
1	Chief Advisor / Road Administration	Hiroki SHINKAI	14.8	6.53
2	Deputy Chief Advisor/ Road O/M Planner 1	Motoki IWAMARU	14.0	5.57
3	Road Structure Planner	Hiroshi FUJISAWA	14.0	9.27
4	Traffic Safety Measures/ Traffic Safety Education	Bindu Shamsher RANA	6.5	2.75
5	Pavement Quality Control	Izumi MIDORIKAWA	5.0	3.20
6	Hydrologic Analysis/ Flood Control	Khadananda LAMSAL	1.0	1.00
7	Road Structural Design	Ramesh Prasad KOIRALA	6.1	3.50
8	Road Disaster Prevention/ EIS	Akhilesh Kumar KARNA	3.5	2.25
9	Toll Road System/ Pre-F/S of Rest Area	Kiyoshi NARITA	3.5	1.70
10	Coordination/ Procurement/ Social Environmental Analysis	Keita IRINO	2.7	1.00
11	Road O/M Planner 2	Hikaru TANAKA	1.0	1.00
		Total	71.30	37.77

(2) Equipment

As of 31st March, 2020

	Item	Quantity	Status
1	Network HDD	1 set	Purchased
2	Projector	1 set	Purchased
3	Camera	1 set	Purchased
4	Multifunction printer	1 set	Purchased
5	Computer	3 set	Purchased
6	Anti-virus software	9 set	3 Purchased
7	Auto CAD LT	3 set	Ordered 1 license for 1-year subscription from May 2019.
8	Acrobat	1 set	To be purchased
9	Uninterruptible power system	3 set	Purchased
10	Inkjet Printer	1 set	To be purchased
11	Furniture	1 set	Purchased

(3) Training in Japan

- Date: 3rd November – 16th November 2019 (14 days)
- Participant: DOR 6, RBN 2, DWRI 1 (Total 9)
- Program:
  - Toll road system & toll collection system
  - Traffic safety and emergency facilities
  - Road disaster prevention / countermeasure technology (incl. frontier technology such as AI and VR)
  - Infrastructure maintenance technology and asset management
  - Pavement technology
  - Contract management of maintenance work
  - Long mountainous tunnel construction technology
  - Preparation of the action plan and presentation

(4) Training Tour in Nepal

- To be discussed in the next JCC meeting

1-2 Progress of Activities

(1) Progress of Activities for Output - 1

- Various maintenance works such as routine, recurrent, periodic, specific, and emergency are On-Going.
- Overlay works for Sec. IV are On-Going.
- Toll collection for the first section is temporarily done with help of DOR instead of contractors which are to be procured by RBN, and the second section is done by the contractor which was already awarded. Retender of the first section will be proceeded after revising traffic volume assumption.

(2) Progress of Activities for Output - 2

- Traffic accident record from 2011 to 2019 was collected through traffic police. Result of its analysis will be effectively utilized in plan of traffic safety measures.
- Installation and painting of guardrails (Crash barriers), guard blocks and delineators are in progress. It is recommended that further safety instrument installation should be proceeded taking into consideration the above traffic accident record.
- Currently none of the Road Information Boards of EIS was being updated, and it needs to update and popularize the EIS web site so that users can get update regarding the road situation.
- Maintenance contracts with private companies related to EIS and ownership of EIS will be discussed in the next JCC meeting.
- Preparation of traffic education materials are in progress.

(3) Progress of Activities for Output - 3

- Through the series of discussion among DOR, JICA and the JICA Expert Team (hereinafter referred to JET), implementing conditions of the Pilot Projects for restoration of damaged causeways was confirmed, and all concerned party have signed the Minutes of Meeting on 26th September 2019. JET will provide technical assistance in the form of soft component and training component, which is expected to contribute to the sustainability of the project impact.
- Detailed design for three bridges was prepared by SDDSBR Project with support by JET, and it is currently under verification.
- IEE study was started from January 2020 for obtain approval of IEE Report by MOPIT before entering the tender process by DOR. However, because the revised version of EPR (Environmental Protection Rule by MOFE / Ministry of Forest and Environment) for IEE and EIA process has not been published to all of ministries yet (as of March 2020), so the TOR of IEE approval process for the pilot project is not further proceeding after being circulated to MOPIT. For this reason, the IEE consultant proposed to suspend their activity for the time being.
- In addition, the IEE consultant proposed to suspend the IEE study activities while continuing lockdown, movement restrictions and/or activities affected by COVID-19 (Coronavirus disease 2019) on 14th April 2019.

1-3 Achievement of Output

(1) Achievement of Output - 1

- The work plan was confirmed among the JET and C/Ps.
- Annual allocated budget in ARMP for FY2019/2020 was confirmed in the 2nd JCC. The latest progress of budget consumption is to be discussed in the next JCC meeting.
- To establish a basic policy for partial widening, JET submitted to DOR a technical report of "Preliminary Survey Report for The Road Improvement Plan" on 18th March 2020.

- RBN started toll collection from 18th September 2019 in separate 2 sections of Dhulikhel - Khurkot and Khurkot - Bardibas in accordance with Nepal gazette published on 15th April 2019
- Held monthly meeting and joint site patrol regularly.

(2) Achievement of Output - 2

- Traffic accident record from 2011 to 2019 was collected through traffic police.
- 35 number of schools along the Sindhuli Road are selected as a target of safety education.
- Additional EIS location was determined as 2 places in Khurkot.
- First traffic survey was conducted in June 2019.

No.	Survey items	Contents
1	Traffic Count	• Road side count @ 6 locations • 24 hrs / 2 weekdays & 1 weekend
2	Origin-Destination	• Interviewing @ 3 locations • 6:00 – 22:00 / 1 weekday
3	Travel Speed	• Measuring travel time • 2 routes (BP Hw. vs. Prithivi Hw.)

- Concept and candidate site of Rest Area were proposed near the Khurkot bus terminal.

(3) Achievement of Output - 3

- Target site and structure type was determined as below

No.	Candidate Sites		Selected Type of Bridge
1	STA. 1+400	Ghyampe Bridge	PC Post-tensioned T-girder (cast-in-situ) bridge (40m)
2	STA. 3+900	Mamti Bridge	RC continuous Slab (cast-in-situ) bridge (40m)
3	STA. 9+700	Bhyakure Bridge	PC Post-tensioned T-girder (cast-in-situ) bridge (40m)

- Topographic and geological surveys were conducted
- Preliminary evaluation was completed.
- Detailed design of the three bridges is underway with the goal of completion by the end of April 2020.
- IEE study was started from January 2020 for obtain approval of IEE Report by MOPIT.

1-4 Achievement of the Project Purpose

- In-progress toward achievement of the project purpose.

1-5 Changes of Risks and Actions for Mitigation

- Sunkoshi Marin Diversion Multipurpose Project

According to the explanation on 2nd JCC meeting about Sunkoshi Marin Diversion Multipurpose Project (SMDMP) which was started by DWRI, it is to be assumed that some part of Sindhuli Road comes under inundation permanently after construction of this project. To maintain the sufficient functions of the Sindhuli

Road, proper detour road planning and design is required. JET will advise DWRI to hold necessary discussion with DOR.

➢ Road Widening

DOR is planning to widen the width of the road at each section, and request for technical assistance was made to JET. After the consultation with JICA, JET replied to DOR that hasty road widening was not recommended, and DOR should plan it with the priority as follows;

●Priority1: Section I (Relatively easier to widen the road than other section, but the part should be limited)

●Priority2: Section IV (The Project will provide technical assistance for partial widening for traffic safety)

●Priority3: Section II & III (Technically difficult, so it must be thoroughly examined before proceeding)

1-6 Progress of Actions undertaken by JICA

➢ In response to changes in the structure type of the pilot project, MM input of JICA experts are slightly extended.

➢ JICA approved the replacement of Mr. Irino, who is in charge of "Coordination, Procurement and Social Environmental Analysis" among JICA experts. His successor will be determined soon.

1-7 Progress of Actions undertaken by Gov. of Nepal

➢ There was a replacement of the engineers from SDDSBRP (Suryabinayak-Dhulikhel, Dhulikhel-Sindhuli-Bardibas Road Project), DOR. Currently appointed three engineers are below. Each engineer's responsibility is assigned according to contract base or section-wise.

- Mr. Sadhusaran Purbe (Main duties: Maintenance and construction works in Sec. I)
- Ms. Bimala Dhami (Main duties: 3 number bridges for Sec. IV, Overlay and road safety)
- Ms. Gitanjali Koirala (Main duties: Road widening, EIS and culvert construction in Sec. I)

1-8 Progress of Environmental and Social Considerations (if applicable)

➢ As described in (3) Progress of Activities for Output - 3.

1-9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

➢ None

1-10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

➢ The revision of the JICA expert assignment schedule was proposed and accepted as of Nov. 2019. The schedule of sub-activities will be revised accordingly.

➢ The Project have been collaborating with below ongoing JICA PPP projects / Survey;

- Feasibility Survey for Traffic Safety Measures using Luminescence Gage Guidance Technology in Nepal
- Collaboration Program with the Private Sector for Disseminating Japanese Technology for Environmentally friendly Slope Restoration by using Soil Algae through Biological Soil Crust (BSC) in Nepal

2　Delay of Work Schedule and/or Problems (if any)

2-1 Detail

- Due to the COVID-19 issue, the 3rd JCC meeting scheduled on 25th March 2020 was canceled and the JICA experts hurriedly returned to Japan on 22nd March in accordance with the instruction from the headquarters of JICA on 18th March.
- The government of Nepal ordered nationwide lockdown and people's movement is prohibited with very limited life safety exceptions. Under this situation, the project activity is being suffering significant restriction.

2-2 Cause

- The globally spreading COVID-19 is seriously affecting any economic activity.

2-3 Action to be taken

- So far there is no prospect for resuming the project activities. After the Japanese experts become able to travel, a meeting should be held to discuss actions to be taken in future.

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Nepal, etc.)

- With regard to the implementation of the pilot project conducted with DOR funds, the roles of JICA, DOR, DWRI and JET were clarified and confirmed in the Minutes of Meeting.
- JET hires environmental engineers for the IEE approval process.

3　Modification of the Project Implementation Plan

3-1 PO

- If the expansion of COVID-19 affects the progress of the project seriously, the PO modification may be necessary.

3-2 Other modifications on detailed implementation plan

- One of "Objectively Verifiable Indicators" of the project overall goal that had been not yet determined is established with mutual confirmation as "Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023".

(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)

4　Preparation of Gov. of Nepal toward after completion of the Project

II. Project Monitoring Sheet I & II *as Attached*

III. Reference Documents

1. Preliminary Survey Report for The Road Improvement Plan
2. Design Report for The Pilot Project (Draft)

Ver. 4

Project Monioring Sheet I

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal
Implementing Agency: Department of Roads (DOR), Department of Water Resources and Irrigation (DWRI) and Roads Board Nepal (RBN)
Target Group: Staff members of DOR, DWRI and RBN
Period of Project: Apr 2019 - Jan 2021 (34 months)
Project Site: Sindhuli Road

Version_4
Dated Dec.21. 2020

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
The safe and smooth road traffic along the Sindhuli Road is maintained.	1. Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023.	1. Traffic accident report by the Sindhuli Road Maintenance Unit (SRMU)/Traffic data by the SRMU	The policy and direction on the road operation and maintenance are not drastically changed by the Government of Nepal (GON).	Set a target indicator that was not yet determined (Ver.2)	Traffic volume and demand is being influenced by COVID-19. observation of future change is required.
	2. Road users' satisfaction to road maintenance and safety management and performance in all sections reaches 4.0 points in average.	2. Interview result of road users based on the traffic survey by the SRMU		-	
	3. DOR operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road effectively in cooperation with DWRI and RBN.	3-1. An execution rate of road maintenance budget allocated by RBN and DOR for Sindhuli Road		-	
		3-2. Road inventory, disaster and maintenance records		-	
		3-3. Operation and maintenance records of EIS		-	
		3-4. Records of road safety countermeasures in the Road Safety Management Plan		-	
	4. DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWRI.	4. Records of road disasters and road maintenance		-	
Project Purpose					
The overall operation and maintenance system of the Sindhuli Road is strengthened.	1. A road closure caused by disasters does not continue for more than one day unless unexpected situation happens.	1. Road maintenance record and hazard record	1. Road safety awareness campaign is conducted by various agencies such as Department of Transport Management, Traffic Police, media and other related agencies.	-	
	2. Surface distress index (SDI) on Sindhuli road keeps in less 2 point (in good condition) through a whole year.	2. SDI record, Disaster record, Road maintenance record, Annual Work Plan			
	3. A cooperative framework and the division of the responsibilities between DOR and DWRI at the Ministry level are institutionalized.	3. Agreement between DOR and DWRI at the Ministry level	2. The budget and personnel necessary for the road operation and maintenance are to be allocated continuously.		
Outputs					
1. Capacity to operate and maintain the Sindhuli Road is improved.	1-1. Routine, recurrent and periodic maintenance are conducted properly in accordance with the Annual Road Maintenance Plan (ARMP).	1-1-1. Maintenance budget allocated from RBN and DOR 1-1-2. An execution rate of the maintenance budget 1-1-3. Record of road maintenance			
	1-2. Specific and emergency maintenance for disaster including emergency response is conducted timely and properly.	1-2. Operation record of maintenance machineries including emergency equipment supplied by JICA			
	1-3. Toll collection system is introduced in the Sindhuli Road in cooperation with DOR and RBN.	1-3. Toll collection system plan in the Sindhuli Road		Toll collection was started from Sep. 2019	
2. Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.	2-1. Emergency Information System (EIS) is operated and managed properly in sustainable manner.	2-1. Operation and maintenance record of EIS			
	2-2. Road safety management is undertaken in accordance with the Road Safety Management Plan.	2-2. Road Safety Management Plan			
	2-3. Awareness and education activities of traffic safety are undertaken by using the developed education materials.	2-3. Education materials of road safety and record of awareness and education activities			
3. Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.	3-1. The Pilot Project for restoration of the damaged causeway is undertaken and completed in cooperation with DOR and	3-1. Implementation schedule of the pilot project			
	3-2. The Project related issues including causeway disaster countermeasures are presented by individual counterpart at the workshops and the Joint Coordinating Committee (JCC) meetings	3-2. Results of seminars and workshops, a manual and training reports			

Activities	Inputs		Important Assumption
	The Japanese Side	The Nepalese Side	
1-1. Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN 1-2. Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2 1-3. Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project 1-4. Update the hazard map and road inventories of the Sindhuli Road 1-5. Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP 1-6. Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening 1-7. Conduct countermeasure works against water induced disasters beyond the right of way by DWRI 1-8. Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN 1-9. Convene regular meetings and monitoring for road operation and maintenance	1. Japanese experts - Chief advisor/Road administration - Deputy Chief Advisor/RoadO/M Planner - Road Structure Planner - Traffic safety Measure/Traffic Safety Education - Pavement Quality Control - Hydrologic Analysis/Flood Control - Road Structural Design - Road Disaster Prevention/EIS - Toll Road System/Pre-F/S of Rest Rrea - Coordination/Procurement/Social Evirmental Analysis 2. Pilot project for restoration of causeway disaster 3. Training in Japan or/and the third countries 4. In country training (technical study tour) 5. Local expenses for the Project activities	1. Counterpart Personnel (C/P) 【DOR】 - Project Director - Project Manager - Engineer - Sub-Engineer 【DWRI】 - Senior Divisional Hydrogeologist - River Disaster Expert (Civil Engineer) 【RBN】 - Senior Engineer 2. Expenses for the related Project activities and others specified in Basic Principles for Technical Cooperation 【DOR】 -Expense for operation and maintenance, and other safety measures of the Sindhuli Road 【DWRI】 -Expense for water induced disaster management works beyond the right of way 【RBN】 -Expense for introduction of the toll collection system 3. Provision of 4-WD vehicle for the site visit 4. Others	
2-1. Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents 2-2. Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan 2-3. Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users 2-4. Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local authorities 2-5. Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.) 2-6. Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities 2-7. Conduct a sharing workshop on road traffic safety 2-8. Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road			**Pre-Conditions** Most of the counterparts who were trained by the Phase 1 keep being deployed as counterparts of the Phase 2.
3-1. Conduct the site survey of the Sindhuli road and select the sites for pilot project 3-2. Conduct the natural condition surveys including EIA, topo. and geological investigations 3-3. Prepare the design, cost estimation and tender documents for the pilot project 3-4. Implementation of the pilot project in collaboration with DWRI 3-5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project 3-6. Prepare the manual about the planning, investigation and design method of the causeway rehabilitation 3-7. Conduct a sharing workshops on pilot project 3-8. Conduct a technical study tour in Nepal			**<Issues and countermeasures>**

Project Monitoring Sheet II

Version_4　　Dated Dec.21. 2020

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal

Inputs	Year	1st Year: 2019/2020				2nd Year: 2020/2021				3rd Year: 2021/2022				Remarks	Monitoring: Issue	Monitoring: Solution
		I	II	III	IV	I	II	III	IV	I	II	III	IV			
		4 5 6	7 8 9	10 11 12	1 2 3	4 5 6	7 8 9	10 11 12	1 2 3	4 5 6	7 8 9	10 11 12	1 2 3			
Expert														■■■: Home assingment in Japan		
1. Chief Advisor/Road Administration	Plan															
	Actual															
2. Deputy Chief Advisor/ Road O/M Planner 1	Plan															
	Actual															
3. Road Structure Planner	Plan															
	Actual															
4. Traffic Safety Measures/ Traffic Safety Education	Plan															
	Actual															
5. Pavement Quality Control	Plan															
	Actual															
6. Hydrologic Analysis/ Flood Control	Plan															
	Actual															
7. Road Structural Design (Causeway)	Plan															
	Actual															
8. Road Disaster Prevention/ EIS	Plan															
	Actual															
9. Toll Road System/ Pre-F/S of Rest Area	Plan															
	Actual															
10. Coordination/ Procurement/ Social Environmental Analysis	Plan															
	Actual													Replaced to Ms Sagawa		
11. Road O/M Planner 2	Plan															
	Actual															
Total	Plan															
	Actual															
Equipment																
To be determined	Plan															
	Actual															
Training in Japan																
November 3 – November 16, 2019. (14 days)	Plan															
	Actual													Completed successfully		
Training Tour																
To be determined	Plan															
	Actual													Asphalt concrete mix design-seminar will be held after February 2021.		

Activities / Sub-Activities	Year	1st Year				2nd Year				3rd Year				Responsible Organization: Japan	Responsible Organization: Nepal	Achievements	Issue & Countermeasures
		I	II	III	IV	I	II	III	IV	I	II	III	IV				
Output 1: Capacity to operate and maintain the Sindhuli Road is improved.																	
1.1 Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN	Plan													JICA Expert	SRMU	Work Plan was confirmed	
	Actual																
1.2 Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2	Plan													JICA Expert	SRMU	Annual allocated budget for 2020/2021 was confirmed	Budget consuption progress is to be discussed
	Actual																
1.3 Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project	Plan													JICA Expert	SRMU, SRDMU, RBN		
	Actual																
1.4 Update the hazard map and road inventories of the Sindhuli Road	Plan													JICA Expert	SRMU		
	Actual																
1.5 Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP	Plan													JICA Expert	SRMU	Various maintenance works are On-Going	
	Actual																
1.6 Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening	Plan													JICA Expert	SRMU	Overlay work is on-going. Basic plan of partial widening is established.	Quality control and implementation plan is to be discussed,
	Actual																
1.7 Conduct countermeasure works against water induced disasters beyond Right of Way by DWRI	Plan													JICA Expert	SRDMU	Target site selection is in progress	To be discussed with DWRI
	Actual																
1.8 Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN	Plan													JICA Expert	SRMU, RBN	Toll system was introduced while contractor procurement is remained	Retender with revising traffic volume assumption
	Actual																
1.9 Convene regular meetings and monitoring for road operation and maintenance	Plan													JICA Expert	SRMU, SRDMU, RBN	Held monthly meeting and joint site patrol	Only online communication due to COVID-19.
	Actual																
Output 2: Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.																	
2.1 Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents	Plan													JICA Expert	SRMU	Collected the accident record from 2011 to 2019	Checking accuracy and analyzing data of 2019
	Actual																
2.2 Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan	Plan													JICA Expert	SRMU	Overall improvement planning are in progress. Concrete block installation and painting works are On-Going	Safety instrument installation should be proceeded based on its prioritization.
	Actual																
2.3 Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users	Plan													JICA Expert	SRMU	Determined the candidate location of additional EIS	Maintenance contract should be processed and handover plan should be determined
	Actual																
2.4 Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local administration	Plan													JICA Expert	SRMU		
	Actual																
2.5 Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.)	Plan													JICA Expert	SRMU	Traffic Survey was conducted in June 2019	Next traffic Survey is planned in June 2020
	Actual																
2.6 Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities	Plan													JICA Expert	SRMU	Target schools are selected and education material preparation is in progress	Framework and schedule of activities should be determined.
	Actual																
2.7 Conduct a sharing workshop on road traffic safety	Plan													JICA Expert	SRMU		
	Actual																
2.8 Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road	Plan													JICA Expert	SRMU	Concept and candidate site was established	
	Actual																
Output 3: Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.																	
3.1 Conduct the site survey of the Sindhuli road and select the sites for pilot project	Plan													JICA Expert	SRMU, SRDMU	Target site was confirmed	
	Actual																
3.2 Conduct the natural condition surveys including EIA, topo. and geological investigations	Plan													JICA Expert	SRMU, SRDMU	Topographic and geological surveys were conducted	
	Actual																
3.3 Prepare the design, cost estimation and tender documents for the pilot project including tender assistant	Plan													JICA Expert	SRMU, SRDMU	Design is approved.	Tender documents will be finalized in two month.
	Actual																
3.4 Implementation of the pilot project in cooperation with DWRI	Plan													JICA Expert	SRMU, SRDMU	Confimed that DWRI will conduct river training.	
	Actual																
3.5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project	Plan													JICA Expert	SRMU, SRDMU	Modality of technical assistance in C/S is to be discussed.	
	Actual																
3.6 Prepare the manual about the planning, investigation and design method of the causeway rehabilitation	Plan													JICA Expert	SRMU, SRDMU	Partial manual preparation is conducting by home assingment.	
	Actual																
3.7 Conduct a sharing workshops on pilot project	Plan													JICA Expert	SRMU, SRDMU		
	Actual																
3.8 Conduct a technical study tour in Nepal	Plan													JICA Expert	SRMU, SRDMU		
	Actual																

Duration / Phasing			
	Plan	Phase 2-1 (18 months)	Phase 2-2 (18 months)
	Actual		

Monitoring Plan	Year	1st Year: 2019/2020				2nd Year: 2020/2021				3rd Year: 2021/2022				Remarks	Issue	Solution
		I	II	III	IV	I	II	III	IV	I	II	III	IV			
Monitoring																
Joint Coordinating Committee (JCC) Meeting	Plan		✓		✓		✓		✓		✓		✓	**Future schedule is to be discussed**	The 5th JCC will be held in June 2021.	
	Actual		✓					✓								
Set-up the Detailed Plan of Operation	Plan	✓														
	Actual	✓														
Submission of Monitoring Sheet	Plan	✓		✓		✓		✓		✓		✓			To be confirmed by remote communication	MS ver.4 will be submitted in Jan 2021
	Actual	✓		✓			✓		✓							
Monthly Meeting	Plan	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓										Held only month that mojor experts are staying	
	Actual	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓														
Monitoring Mission from Japan	Plan															
	Actual															
Joint Monitoring	Plan															
	Actual															
Post Monitoring	Plan															
	Actual															
Reports/Documents																
Work Plan of Phase 2	Plan	✓													None	
	Actual	✓														
Project Completion Report	Plan												✓			
	Actual															
Public Relations																
Details to be determined	Plan															
	Actual															
	Plan															
	Actual															

SRMU: Sindhuli Road Maintenance Unit (under DOR)

SRDMU: Sindhuli Road Disaster Management Unit (under DWRI)

TO CR of JICA NEPAL OFFICE

PROJECT MONITORING SHEET Ver.4 (Jan. 2021)

Project Title:
The Project for the Operation and Maintenance of the Sindhuli Road Phase 2
Version of the Sheet: Ver.4

Name: Arjun Jung Thapa
Title: DDG of DCID, DOR
Name: Hiroki Shinkai
Title: Chief Advisor / Road Administration
Submission Date: 14th January 2021

I. Summary

1 Progress

1-1 Progress of Inputs

(1) Experts

As of 31st December, 2020

	Position	Name	Plan MM	Accumulated MM
1	Chief Advisor / Road Administration	Hiroki SHINKAI	15.5	9.6
2	Deputy Chief Advisor/ Road O/M Planner 1	Motoki IWAMARU	14.6	8.5
3	Road Structural Planner	Hiroshi FUJISAWA	15.1	12.4
4	Traffic Safety Measures/ Traffic Safety Education / Project Coordinator	Bindu Shamsher RANA	9.5	4.5
5	Pavement Quality Control	Izumi MIDORIKAWA	5.2	3.8
6	Hydrologic Analysis/ Flood Control	Khadananda LAMSAL	1.0	1.0
7	Road Structural Design	Ramesh Prasad KOIRALA	6.1	3.5
8	Road Disaster Prevention/ EIS	Akhilesh Kumar KARNA	3.5	3.0
9	Toll Road System/ Pre-F/S of Rest Area	Kiyoshi NARITA	3.6	2.3
10	Coordination/ Procurement/ Social Environmental Analysis	Keita IRINO	2.0	1.0
11	Coordination/Procurement	Natsuko SAGAWA	1.9	0.4
12	Road O/M Planner 2	Hikaru TANAKA	0.0	1.0
		Total	78.0	50.9

(2) Equipment

As of 31st December, 2020

	Item	Quantity	Status
1	Network HDD	1 set	Purchased
2	Projector	1 set	Purchased
3	Camera	1 set	Purchased
4	Multifunction printer	1 set	Purchased
5	Computer	3 set	Purchased
6	Anti-virus software	9 set	3 Purchased
7	Auto CAD LT	3 set	Ordered 1 license for 1-year subscription from May 2019.
8	Acrobat	1 set	To be purchased
9	Uninterruptible power system	3 set	Purchased
10	Inkjet Printer	1 set	To be purchased
11	Furniture	1 set	Purchased

(3) Training in Japan

- Date: 3rd November – 16th November 2019 (14 days)
- Participant: DOR 6, RBN 2, DWRI 1 (Total 9)
- Program:
  - Toll road system & toll collection system
  - Traffic safety and emergency facilities
  - Road disaster prevention / countermeasure technology (incl. frontier technology such as AI and VR)
  - Infrastructure maintenance technology and asset management
  - Pavement technology
  - Contract management of maintenance work
  - Long mountainous tunnel construction technology
  - Preparation of the action plan and presentation

(4) Training Tour in Nepal

- Asphalt concrete mix design-training tour is planned to be held as a part of Training tour. Initially, the tour was going to held in October 2020. However, considering the impart of COVID-19, tour will be held after February 2021 which is better condition for overlay work.

1-2 Progress of Activities

(1) Progress of Activities for Output - 1

- Various maintenance works such as routine, recurrent, periodic, specific, and emergency are On-Going.
- Overlay works for Sec. IV are On-Going. JICA Expert is going provide technical assistance for quality control of pavement works by DOR.
- Toll collection for the first section (Dhulikhel - Khurkot) is temporarily done with help of DOR instead of

contractors which are to be procured by RBN, and the second section (Khurkot - Bardibas) is done by the contractor which was already awarded. Retender of the first section will be proceeded after revising traffic volume assumption. However, toll collection by the above system is being suspended from March 2020 due to COVID-19.

- Hybrid Electronic Toll Collection (HETC) is going to be replaced to the traditional type of toll collection system and RBN is planning to install HETC as a pilot project in technical support of JICA Experts. Two separate biddings were ordered for the introduction of HETC. One is the construction of toll plaza. Another is the construction of administration office and the development of HETC system, etc. However, bidding procedure of above toll gate construction and system design for HETC has been postponed.

(2) Progress of Activities for Output - 2

- Traffic accident record from 2011 to 2019 was collected through traffic police. Result of its analysis will be effectively utilized in plan of traffic safety measures.
- Installation and painting of guardrails (Crash barriers), guard blocks and delineators are in progress. It is recommended that further safety instrument installation should be proceeded taking into consideration the above traffic accident record.
- Currently none of the Road Information Boards of EIS was being updated, and it needs to update and popularize the EIS web site so that users can get update regarding the road situation. JET advised SDDSBR about improvement of operation system and improvement plan is in progress.
- Proposal for Improvement of EIS (with cost estimation and drawings) and proposed contract document for maintenance of EIS (with cost estimation) were submitted to DOR in July 2020. However, due to COVID-19, the procurement has not yet finished.
- Preparation of traffic education materials are in progress.

(3) Progress of Activities for Output - 3

- Through the series of discussion among DOR, JICA and the JICA Expert Team (hereinafter referred to JET), implementing conditions of the Pilot Projects for restoration of damaged causeways was confirmed, and all concerned party have signed the Minutes of Meeting on 26th September 2019. JET will provide technical assistance in the form of soft component and training component, which is expected to contribute to the sustainability of the project impact.
- Detailed design for three bridges was prepared by SDDSBR Project Office with support by JET, and it was completed to verify by DOR in the end of November 2020 and then abstract of the cost for three bridges were estimated in the early December 2020. SDDSBR Project office will start preparation for procurement of three packages for Mamti, Bhyakure and Ghyampe bridges.
- Environmental study was started from January 2020 for obtain approval of IEE Report by MOPIT before commencement of the construction. However, due to the fact that a new version of EPR 2020 (Environmental Protection Rules by the Ministry of the Environment) regarding the environmental survey

process has not been released, and due to the lock down and movement restrictions by COVID-19 started from the end of March 2020, the environmental survey was suspended their activity for the time being.

- After that, with the release of the new EPR 2020 in September 2020 and the approval of the new template for TOR of Brief Environmental Study (IEE was changed to BES) in early December 2020, a new TOR is currently being created and is expected to be submitted at end of December 2020.
- Manual preparation about site investigation, planning and design method for RC continuous slab bridge starts from June 2020 and will be continued upto the end of March 2021.

1-3 Achievement of Output

(1) Achievement of Output - 1

- The work plan was confirmed among the JET and C/Ps.
- Annual allocated budget in ARMP for FY2019/2020 was confirmed in the 2nd JCC Meeting, and the budget for FY 2020/2021 was confirmed at the 4th JCC Meeting on 21st December 2020.
- To establish a basic policy for partial widening, JET submitted to DOR a technical report of "Preliminary Survey Report for The Road Improvement Plan" on 18th March 2020.
- RBN started toll collection from 18th September 2019 in separate 2 sections of Dhulikhel - Khurkot and Khurkot - Bardibas in accordance with Nepal gazette published on 15th April 2019
- Held monthly meeting and joint site patrol regularly.

(2) Achievement of Output - 2

- Traffic accident record from 2011 to 2019 was collected through traffic police.
- 35 number of schools along the Sindhuli Road are selected as a target of safety education.
- Additional EIS location was determined as 2 places in Khurkot
- First traffic survey was conducted in June 2019.

No.	Survey items	Contents
1	Traffic Count	・ Road side count @ 6 locations ・ 24 hrs / 2 weekdays & 1 weekend
2	Origin-Destination	・ Interviewing @ 3 locations ・ 6:00 – 22:00 / 1 weekday
3	Travel Speed	・ Measuring travel time ・ 2 routes (BP Hw. vs. Prithivi Hw.)

- Concept and candidate site of Rest Area were proposed near the Khurkot bus terminal.

(3) Achievement of Output - 3

- Target site and structure type was determined as below

No.	Candidate Sites		Selected Type of Bridge
1	STA. 1+400	Ghyampe Bridge	PC Post-tensioned T-girder (cast-in-situ) bridge (40m)
2	STA. 3+900	Mamti Bridge	RC continuous Slab (cast-in-situ) bridge (40m)
3	STA. 9+700	Bhyakure Bridge	PC Post-tensioned T-girder (cast-in-situ) bridge (40m)

- Topographic and geological surveys were conducted
- Detailed design of the three bridges was completed.
- Environmental study was started from January 2020 for obtain approval of BES Report by MOPIT.

1-4 Achievement of the Project Purpose

- In-progress toward achievement of the project purpose.

1-5 Changes of Risks and Actions for Mitigation

- Sunkoshi Marin Diversion Multipurpose Project

According to the explanation on 2nd JCC meeting about Sunkoshi Marin Diversion Multipurpose Project (SMDMP) which was started by DWRI, it is to be assumed that some part of Sindhuli Road comes under inundation permanently after construction of this project. To maintain the sufficient functions of the Sindhuli Road, proper detour road planning and design is required.

- Road Widening

DOR is planning to widen the width of the road at each section, and request for technical assistance was made to JET. After the consultation with JICA, JET replied to DOR that hasty road widening was not recommended, and DOR should plan it with the priority as follows;

Priority1: Section I (Relatively easier to widen the road than other section, but the part should be limited)

Priority2: Section IV (The Project will provide technical assistance for partial widening for traffic safety)

Priority3: Section II & III (Technically difficult, so it must be thoroughly examined before proceeding)

- Mitigation Measures against COVID-19

In order to mitigate the effect of COVID-19 Pandemic, every protocol issued to the public by the Government, such as wearing mask, taking temperature and keeping social distance, shall strictly be followed through the Project's activities.

1-6 Progress of Actions undertaken by JICA

- JICA approved the replacement of Mr. Irino, who was in charge of "Coordination, Procurement and

Social Environmental Analysis", and his successor is Ms. Sagawa from Nippon Koei, from the month of April 2020.

- JICA has approved home assignment of Japanese members among JET in response to the travel restriction due to COVID-19 pandemic after the month of April 2020.
- JICA approved to appoint Mr. Rana, who is one of JET, as a "Project Coordinator" in addition to the current position as "Traffic Safety Measures/ Traffic Safety Education", in order to undertake a role of smooth communication under the situation of remote assignment period.
- JICA agreed that Record of Discussions (R/D) should be amended after obtaining an internal approval in DOR and JICA regarding the extension of the project period, based on discussion in the 4th JCC Meeting.

1-7 Progress of Actions undertaken by Gov. of Nepal

- There was a replacement of the engineers from SDDSBRP (Suryabinayak-Dhulikhel, Dhulikhel-Sindhuli-Bardibas Road Project), DOR. Currently appointed only one engineer is below. Dispatching sufficient number of engineers is required for covering the PDM activities.
- Construction of the three (3) bridges shall be executed in accordance with the implementation plan approved by the 4th JCC Meeting.
- Two biddings of Hybrid ETC system were announced on September 16th, 2020. The bid will be opened January 2020.

1-8 Progress of Environmental and Social Considerations (if applicable)

- As described in (3) Progress of Activities for Output - 3.

1-9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

- None

1-10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

- The revision of the JET assignment schedule was proposed and accepted as of Oct. 2020. The schedule of sub-activities will be revised accordingly.
- The Project have been collaborating with below ongoing JICA PPP projects / Survey;
  - Feasibility Survey for Traffic Safety Measures using Luminescence Gage Guidance Technology in Nepal
  - Collaboration Program with the Private Sector for Disseminating Japanese Technology for Environmentally friendly Slope Restoration by using Soil Algae through Biological Soil Crust (BSC) in Nepal

2　Delay of Work Schedule and/or Problems (if any)

2-1 Detail

- Due to the COVID-19 issue, the 3rd JCC meeting scheduled on 25th March 2020 was canceled and the

JICA experts hurriedly returned to Japan on 22nd March in accordance with the instruction from the headquarters of JICA on 18th March. After that, JET is continuing to be involved only by remote communication with the Nepalese side.

- COVID-19 influenced financial situation of the Nepalese government due to constraint on economic activity, and the budget for Sindhuli Road was significantly reduced. Due to this situation, implementation plan of three bridge has to be postponed.

2-2 Cause

- The globally spreading COVID-19 is seriously affecting any economic activity.

2-3 Action to be taken

- In the 4th JCC Meeting, both parties agreed to extend the period of SROM2 with the conditions written in the Minutes of Meeting of the 4th JCC Meeting.
- In order to mitigate the effect of COVID-19 Pandemic, every protocol issued to the public by GoN, such as wearing mask, taking temperature and keeping social distance, shall strictly be followed accordingly through the Project's activities.

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Nepal, etc.)

- With regard to the implementation of the pilot project conducted with DOR funds, the roles of JICA, DOR, DWRI and JET were clarified and confirmed in the Minutes of Meeting. DOR is required to make efforts to develop maintenance and management capacity under their own initiative in cooperation with JICA and JICA Expert Team by utilizing this opportunity.
- After obtaining an internal approval in DOR and JICA regarding the extension of the project period, Record of Discussions (R/D) should be amended.
- JET hires environmental engineers for the IEE approval process.

3　Modification of the Project Implementation Plan

3-1 PO

- If the expansion of COVID-19 affects the progress of the project seriously, the PO modification may be necessary.
- One of "Objectively Verifiable Indicators" of the project overall goal that had been not yet determined is established with mutual confirmation as "Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023".

3-2 Other modifications on detailed implementation plan

- As DOR agreed to construct three (3) bridges, namely Mamti, Bhyakure and Ghyampe, as Pilot Project at the cost of DOR as per the Minutes of Meeting on August 28, 2019. DOR will implement three (3) bridges, however, due to the budget constrain caused by COVID-19, DOR decided to implement the procurement of contractor including the mobilization for three (3) bridges based on the available budget for FY2020/21. Actual construction will start at the end of rainy season in 2021after securing the budget

of FY2021/22. Construction of the three (3) bridges shall be executed in accordance with the implementation plan approved by the 4th JCC Meeting. (See Annex 2 in the Minutes of Meeting of the 4th JCC Meeting)

4 Preparation of Gov. of Nepal toward after completion of the Project

- -

II. Project Monitoring Sheet I & II *as Attached*

III. Reference Documents

1. Design Report for The Pilot Project, October 2020

Ver. 5

Project Monioring Sheet I

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal
Implementing Agency: Department of Roads (DOR), Department of Water Resources and Irrigation (DWRI) and Roads Board Nepal (RBN)
Target Group: Staff members of DOR, DWRI and RBN
Period of Project: Apr 2019 - Mar 2023 (48 months)
Project Site: Sindhuli Road

Version_5
Dated August 2. 2021

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
The safe and smooth road traffic along the Sindhuli Road is maintained.	1. Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023.	1. Traffic accident report by the Sindhuli Road Maintenance Unit (SRMU)/Traffic data by the SRMU	The policy and direction on the road operation and maintenance are not drastically changed by the Government of Nepal (GON).	Set a target indicator that was not yet determined (Ver.2)	Traffic volume and demand is being influenced by COVID-19 pandemic. observation of future change is required.
	2. Road users' satisfaction to road maintenance and safety management and performance in all sections reaches 4.0 points in average.	2. Interview result of road users based on the traffic survey by the SRMU		-	
	3. DOR operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road effectively in cooperation with DWRI and RBN.	3-1. An execution rate of road maintenance budget allocated by RBN and DOR for Sindhuli Road		-	
		3-2. Road inventory, disaster and maintenance records		-	
		3-3. Operation and maintenance records of EIS		-	
		3-4. Records of road safety countermeasures in the Road Safety Management Plan		-	
	4. DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWRI.	4. Records of road disasters and road maintenance		-	
Project Purpose					
The overall operation and maintenance system of the Sindhuli Road is strengthened.	1. A road closure caused by disasters does not continue for more than one day unless unexpected situation happens.	1. Road maintenance record and hazard record	1. Road safety awareness campaign is conducted by various agencies such as Department of Transport Management, Traffic Police, media and other related agencies.	-	
	2. Surface distress index (SDI) on Sindhuli road keeps in less 2 point (in good condition) through a whole year.	2. SDI record, Disaster record, Road maintenance record, Annual Work Plan			
	3. A cooperative framework and the division of the responsibilities between DOR and DWRI at the Ministry level are institutionalized.	3. Agreement between DOR and DWRI at the Ministry level	2. The budget and personnel necessary for the road operation and maintenance are to be allocated continuously.		
Outputs					
1. Capacity to operate and maintain the Sindhuli Road is improved.	1-1. Routine, recurrent and periodic maintenance are conducted properly in accordance with the Annual Road Maintenance Plan (ARMP).	1-1-1. Maintenance budget allocated from RBN and DOR 1-1-2. An execution rate of the maintenance budget 1-1-3. Record of road maintenance			
	1-2. Specific and emergency maintenance for disaster including emergency response is conducted timely and properly.	1-2. Operation record of maintenance machineries including emergency equipment supplied by JICA			
	1-3. Toll collection system is introduced in the Sindhuli Road in cooperation with DOR and RBN.	1-3. Toll collection system plan in the Sindhuli Road		Toll collection was started from Sep. 2019.	
2. Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.	2-1. Emergency Information System (EIS) is operated and managed properly in sustainable manner.	2-1. Operation and maintenance record of EIS			
	2-2. Road safety management is undertaken in accordance with the Road Safety Management Plan.	2-2. Road Safety Management Plan			
	2-3. Awareness and education activities of traffic safety are undertaken by using the developed education materials.	2-3. Education materials of road safety and record of awareness and education activities			
3. Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.	3-1. The Pilot Project for restoration of the damaged causeway is undertaken and completed in cooperation with DOR and DWRI.	3-1. Implementation schedule of the pilot project		Procurement was conducted for 3 Bridges of Pilot PJT. There was more than 10 bid of each bridges.	
	3-2. The Project related issues including causeway disaster countermeasures are presented by individual counterpart at the workshops and the Joint Coordinating Committee (JCC) meetings.	3-2. Results of seminars and workshops, a manual and training reports		Technical Training on Asphalt Concrete Mix Design and Quality Control in Pavement Construction was held on Feb. 2021	

Activities	Inputs		Important Assumption
	The Japanese Side	The Nepalese Side	
1-1. Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN 1-2. Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2 1-3. Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project 1-4. Update the hazard map and road inventories of the Sindhuli Road 1-5. Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP 1-6. Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening 1-7. Conduct countermeasure works against water induced disasters beyond the right of way by DWRI 1-8. Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN 1-9. Convene regular meetings and monitoring for road operation and maintenance	1. Japanese experts - Chief advisor/Road administration - Deputy Chief Advisor/RoadO/M Planner - Road Structure Planner - Traffic safety Measure/Traffic Safety Education - Pavement Quality Control - Hydrologic Analysis/Flood Control - Road Structural Design - Road Disaster Prevention/EIS - Toll Road System/Pre-F/S of Rest Rrea - Coordination/Procurement/Social Evirmental Analysis 2. Pilot project for restoration of causeway disaster 3. Training in Japan or/and the third countries 4. In country training (technical study tour) 5. Local expenses for the Project activities	1. Counterpart Personnel (C/P) 【DOR】 - Project Director - Project Manager - Engineer - Sub-Engineer 【DWRI】 - Senior Divisional Hydrogeologist - River Disaster Expert (Civil Engineer) 【RBN】 - Senior Engineer 2. Expenses for the related Project activities and others specified in Basic Principles for Technical Cooperation 【DOR】 -Expense for operation and maintenance, and other safety measures of the Sindhuli Road 【DWRI】 -Expense for water induced disaster management works beyond the right of way 【RBN】 -Expense for introduction of the toll collection system 3. Provision of 4-WD vehicle for the site visit 4. Others	
2-1. Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents 2-2. Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan 2-3. Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users 2-4. Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local authorities 2-5. Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.) 2-6. Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities 2-7. Conduct a sharing workshop on road traffic safety 2-8. Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road			
3-1. Conduct the site survey of the Sindhuli road and select the sites for pilot project 3-2. Conduct the natural condition surveys including EIA, topo. and geological investigations 3-3. Prepare the design, cost estimation and tender documents for the pilot project 3-4. Implementation of the pilot project in collaboration with DWRI 3-5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project 3-6. Prepare the manual about the planning, investigation and design method of the causeway rehabilitation 3-7. Conduct a sharing workshops on pilot project 3-8. Conduct a technical study tour in Nepal			

Pre-Conditions
Most of the counterparts who were trained by the Phase 1 keep being deployed as counterparts of the Phase 2.
<Issues and countermeasures>

Project Monitoring Sheet II

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal

Version_5

Dated August 2. 2021

Inputs	Year	1st Year: 2019/2020	2nd Year: 2020/2021	3rd Year: 2021/2022	4th Year: 2022/2023	Remarks	Monitoring: Issue	Monitoring: Solution
		I II III IV	I II III IV	I II III IV	I II III IV			
		4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3			
Expert						': Home assingment in Japan		
1. Chief Advisor/Road Administration	Plan							
	Actual							
2. Deputy Chief Advisor/ Road O/M Planner 1	Plan							
	Actual							
3. Road Structure Planner	Plan							
	Actual							
4. Traffic Safety Measures/ Traffic Safety Education	Plan							
	Actual							
5. Pavement Quality Control	Plan							
	Actual							
6. Hydrologic Analysis/ Flood Control	Plan							
	Actual							
7. Road Structural Design (Causeway)	Plan							
	Actual							
8. Road Disaster Prevention/ EIS	Plan							
	Actual							
9. Toll Road System/ Pre-F/S of Rest Area	Plan							
	Actual							
10. Coordination/ Procurement/ Social Environmental Analysis	Plan							
	Actual							
11. Road O/M Planner 2	Plan							
	Actual							
Total	Plan							
	Actual							
Equipment								
To be determined	Plan						Due to COVID-19 impact,from April 2019 to September 2021, assignment of Japanese Experts was suspended.	MM was shifted after April 2021 or partially consume by home assignment (in Japan)
	Actual							
Training in Japan							To be determined	
November 3 – November 16, 2019. (14 days)	Plan					Completed successfully		
	Actual							
Training Tour								
Technical Training on Asphalt Concrete Mix Design and Quality Control in Pavement Construction	Plan						Asphalt concrete mix design-seminar was held February 2021 and finished successfully.	
	Actual							

Activities / Sub-Activities	Year	1st Year	2nd Year	3rd Year	3rd Year	Responsible Organization: Japan	Responsible Organization: Nepal	Achievements	Issue & Countermeasures
		I II III IV	I II III IV	I II III IV	I II III IV				
Output 1: Capacity to operate and maintain the Sindhuli Road is improved.									
1.1 Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN	Plan					JICA Expert	SRMU	Work Plan was confirmed	
	Actual								
1.2 Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2	Plan					JICA Expert	SRMU	Annual allocated budget for 2020/2021 was confirmed	Budget consuption progress is to be discussed
	Actual								
1.3 Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project	Plan					JICA Expert	SRMU, SRDMU, RBN		
	Actual								
1.4 Update the hazard map and road inventories of the Sindhuli Road	Plan					JICA Expert	SRMU		
	Actual								
1.5 Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP	Plan					JICA Expert	SRMU	Various maintenance works are On-Going	
	Actual								
1.6 Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening	Plan					JICA Expert	SRMU	Overlay work will be done within FY 2021/2022. Heavy overlay damage has confirmed between Dhulikhel - Patalekhet where overlay work was done 2 years ago. Basic plan of partial widening is established.	Reconstruction of Dhulikhel - Patalekhet overlay work was proposed. Quality control and implementation plan is to be discussed,
	Actual								
1.7 Conduct countermeasure works against water induced disasters beyond Right of Way by DWRI	Plan					JICA Expert	SRDMU	Target site selection is in progress	To be discussed with DWRI
	Actual								
1.8 Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN	Plan					JICA Expert	SRMU, RBN	Toll system was introduced while contractor procurement is remained	Retender with revising traffic volume assumption
	Actual								
1.9 Convene regular meetings and monitoring for road operation and maintenance	Plan					JICA Expert	SRMU, SRDMU, RBN	Held monthly meeting and joint site patrol	Only online communication due to COVID-19.
	Actual								
Output 2: Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.									
2.1 Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents	Plan					JICA Expert	SRMU	Collected the accident record from 2011 to 2019	Checking accuracy and analyzing data of 2019
	Actual								
2.2 Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan	Plan					JICA Expert	SRMU	Overall improvement planning are in progress. Concrete block installation and painting works are On-Going	Safety instrument installation should be proceeded based on its prioritization.
	Actual								
2.3 Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users	Plan					JICA Expert	SRMU	Determined the candidate location of additional EIS	Maintenance contract should be processed and handover plan should be determined
	Actual								
2.4 Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local administration	Plan					JICA Expert	SRMU		
	Actual								
2.5 Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.)	Plan					JICA Expert	SRMU	Traffic Survey was conducted in June 2019	Next traffic Survey is planned in June 2020
	Actual								
2.6 Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities	Plan					JICA Expert	SRMU	Target schools are selected and education material preparation is in progress	Framework and schedule of activities should be determined.
	Actual								
2.7 Conduct a sharing workshop on road traffic safety	Plan					JICA Expert	SRMU		
	Actual								
2.8 Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road	Plan					JICA Expert	SRMU	Concept and candidate site was established	
	Actual								
Output 3: Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.									
3.1 Conduct the site survey of the Sindhuli road and select the sites for pilot project	Plan					JICA Expert	SRMU, SRDMU	Target site was confirmed	
	Actual								
3.2 Conduct the natural condition surveys including EIA, topo. and geological investigations	Plan					JICA Expert	SRMU, SRDMU	topographic and geological surveys were conducted	
	Actual								
3.3 Prepare the design, cost estimation and tender documents for the pilot project including tender assistant	Plan					JICA Expert	SRMU, SRDMU	Design is approved. Procurement was conducted and there were more than 10 bid of each bridges.	Tender documents will be finalized in two month.
	Actual								
3.4 Implementation of the pilot project in cooperation with DWRI	Plan					JICA Expert	SRMU, SRDMU	Confimed that DWRI will conduct river training.	
	Actual								
3.5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project	Plan					JICA Expert	SRMU, SRDMU	Modality of technical assistance in C/S is to be discussed.	
	Actual								
3.6 Prepare the manual about the planning, investigation and design method of the causeway rehabilitation	Plan					JICA Expert	SRMU, SRDMU	Partial manual preparation is conducting by home assingment.	
	Actual								
3.7 Conduct a sharing workshops on pilot project	Plan					JICA Expert	SRMU, SRDMU		
	Actual								
3.8 Conduct a technical study tour in Nepal	Plan					JICA Expert	SRMU, SRDMU	Asphalt concrete mix design-seminar was held February 2021 and finished successfully.	
	Actual								

Duration / Phasing									
	Plan	Phase 2-1 (18 months)		Phase 2-2 (18 months)					
	Actual								

Monitoring Plan	Year	1st Year: 2019/2020	2nd Year: 2020/2021	3rd Year: 2021/2022	4th Year: 2022/2023	Remarks	Issue	Solution
		I II III IV	I II III IV	I II III IV	I II III IV			
Monitoring								
Joint Coordinating Committee (JCC) Meeting	Plan	✓ ✓ ✓	✓ ✓	✓ ✓ ✓	✓ ✓ ✓	The 6th JCC will be held in December 2021. 8th JCC was added regarding with extension of the Project period.	Project is proceeding by remote communication.	JCC is held by using online video meeting.
	Actual	✓ ✓ ✓	✓	✓ ✓				
Set-up the Detailed Plan of Operation	Plan	✓						
	Actual	✓						
Submission of Monitoring Sheet	Plan	✓ ✓ ✓	✓	✓ ✓ ✓	✓ ✓ ✓		To be confirmed by remote communication	MS ver.5 will be submitted in August 2021
	Actual	✓ ✓	✓	✓ ✓				
Monthly Meeting	Plan	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓		Held only month that mojor experts are staying	
	Actual	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓	✓ ✓				
Monitoring Mission from Japan	Plan							
	Actual							
Joint Monitoring	Plan							
	Actual							
Post Monitoring	Plan							
	Actual							
Reports/Documents								
Work Plan of Phase 2	Plan	✓					None	
	Actual	✓						
Project Completion Report	Plan				✓			
	Actual							
Public Relations								
Details to be determined	Plan							
	Actual							
	Plan							
	Actual							

SRMU: Sindhuli Road Maintenance Unit (under DOR)　SRMU: Sindhuli Road Maintenance Unit (under DOR)

SRDMU: Sindhuli Road Disaster Management Unit (unde　SRDMU: Sindhuli Road Disaster Management Unit (under DWRI)

TO CR of JICA NEPAL OFFICE

PROJECT MONITORING SHEET Ver.5 (Aug. 2021)

Project Title:
The Project for the Operation and Maintenance of the Sindhuli Road Phase 2
Version of the Sheet: Ver.5

Name: Ram Hari Pokharel
Title: DDG of DCID, DOR
Name: Hiroki Shinkai
Title: Chief Advisor / Road Administration
Submission Date: 4th August 2021

I. Summary

1 Progress

1-1 Progress of Inputs

(1) Experts

As of 4th August, 2021

	Position	Name	Plan MM	Accumulated MM
1	Chief Advisor / Road Administration	Hiroki SHINKAI	18.9	12.2
2	Deputy Chief Advisor/ Road O/M Planner 1	Motoki IWAMARU	18.0	10.6
3	Road Structural Planner	Hiroshi FUJISAWA	18.0	13.2
4	Traffic Safety Measures/ Traffic Safety Education / Project Coordinator	Bindu Shamsher RANA	11.3	7.0
5	Pavement Quality Control	Izumi MIDORIKAWA	5.9	4.2
6	Hydrologic Analysis/ Flood Control	Khadananda LAMSAL	1.0	1.0
7	Road Structural Design	Ramesh Prasad KOIRALA	7.1	3.8
8	Road Disaster Prevention/ EIS	Akhilesh Kumar KARNA	3.9	3.3
9	Toll Road System/ Pre-F/S of Rest Area	Kiyoshi NARITA	3.6	2.9
10	Coordination/ Procurement/ Social Environmental Analysis	Keita IRINO	2.0	1.0
11	Coordination/Procurement	Natsuko SAGAWA	2.8	1.2
12	Road O/M Planner 2	Hikaru TANAKA	0.0	1.0
		Total	92.5	61.4

(2) Equipment

As of 4th August, 2021

	Item	Quantity	Status
1	Network HDD	1 set	Purchased
2	Projector	1 set	Purchased
3	Camera	1 set	Purchased
4	Multifunction printer	1 set	Purchased
5	Computer	3 set	Purchased
6	Anti-virus software	9 set	3 Purchased
7	Auto CAD LT	3 set	Ordered 1 license for 1-year subscription from May 2019.
8	Acrobat	1 set	To be purchased
9	Uninterruptible power system	3 set	Purchased
10	Inkjet Printer	1 set	To be purchased
11	Furniture	1 set	Purchased

(3) Training in Japan

- Date: 3rd November – 16th November 2019 (14 days)
- Participant: DOR 6, RBN 2, DWRI 1 (Total 9)
- Program:
  - Toll road system & toll collection system
  - Traffic safety and emergency facilities
  - Road disaster prevention / countermeasure technology (incl. frontier technology such as AI and VR)
  - Infrastructure maintenance technology and asset management
  - Pavement technology
  - Contract management of maintenance work
  - Long mountainous tunnel construction technology
  - Preparation of the action plan and presentation

(4) Training Tour in Nepal

Technical training on asphalt concrete mix design and quality control in pavement construction was held on February 2021 as a part of "Training tour" and finished successfully.

- Date: 14th February – 18th February 2021 (5days)
- Participant: 13 trainees from DOR
- Program:

Day1	• Pavement condition of Sindhuli Road Project • Introduction of flexible/bitumen pavement • Selection of binder • Test of aggregates and binder • Marshall procedure of mix design • Determination of job mix formula

	• Test of aggregates and binder
Day2	• Interpretation of test results • Determination of theoretical grading • Selection of mix proportion and preparation of different mixes • Marshall procedures and necessary tests of marshall specimens
Day3	• Field visit to batching plant in Bhaktapur and Sindhuli Road upto Mulkot bends
Day4	• Marshall stability, flow test and interpretation of test results • Mix design calculation, determination of job mix formula of mix design and finalization of optimum bitumen content (OBC)
Day5	• Presentation and submission of mix design calculation and discission of results • Group discussion

- Necessary precaution as per COVID-19 protocol was maintained during the whole training program.

1-2 Progress of Activities

(1) Progress of Activities for Output - 1

- Various maintenance works such as routine, recurrent, periodic, specific, and emergency are On-Going.
- Overlay works for Sec. IV are On-Going. JICA Expert is going provide technical assistance for quality control of pavement works by DOR. It will be done within FY 2021/2022.
- Heavy overlay damage has confirmed between Dhulikhel – Patalekhet where overlay work was done 2 years ago. JICA Expert Team (hereinafter referred to JET) suppose DOR for the reconstruction of it.
- Toll collection for the first section (Dhulikhel - Khurkot) is temporarily done with help of DOR instead of contractors which are to be procured by RBN, and the second section (Khurkot - Bardibas) is done by the contractor which was already awarded. Retender of the first section will be proceeded after revising traffic volume assumption. However, toll collection by the above system is being suspended from March 2020 due to COVID-19.
- Hybrid Electronic Toll Collection (HETC) is going to be replaced to the traditional type of toll collection system and RBN is planning to install HETC as a pilot project in technical support of JICA Experts. Two separate biddings were ordered for the introduction of HETC. One is the construction of toll plaza. Another is the construction of administration office and the development of HETC system, etc. Bid of theses construction were announced September 2020 and evaluation process is currently on-going.
- HETC system will be introduced under the supervision of a local consultant hired by RBN. After selecting contractor of the HETC, scope of the technical support by JET will be discussed with RBN and local consultant.

(2) Progress of Activities for Output - 2

- Traffic accident record from 2011 to 2019 was collected through traffic police. Result of its analysis will be effectively utilized in plan of traffic safety measures.

- Installation and painting of guardrails (Crash barriers), guard blocks and delineators are in progress. It is recommended that further safety instrument installation should be proceeded taking into consideration the above traffic accident record.
- Currently none of the Road Information Boards of EIS was being updated, and it needs to update and popularize the EIS web site so that users can get update regarding the road situation. JET advised SDDSBR about improvement of operation system and improvement plan is in progress.
- Proposal for Improvement of EIS (with cost estimation and drawings) and proposed contract document for maintenance of EIS (with cost estimation) were submitted to DOR in July 2020. However, due to COVID-19, the procurement has not yet finished.
- JET recommends to organize a short (half-day) workshop among the concerned DOR offices. However due to spread of COVID-19, schedule of short workshop has not decided yet.
- Preparation of traffic education materials are in progress.

(3) Progress of Activities for Output - 3

- Through the series of discussion among DOR, JICA and JET, implementing conditions of the Pilot Projects for restoration of damaged causeways was confirmed, and all concerned party have signed the Minutes of Meeting on 26th September 2019. JET will provide technical assistance in the form of soft component and training component, which is expected to contribute to the sustainability of the project impact.
- Detailed design for three bridges was prepared by SDDSBR Project Office with support by JET, and it was completed to verify by DOR in the end of November 2020 and then abstract of the cost for three bridges were estimated in the early December 2020. SDDSBR Project office will start preparation for procurement of three packages for Mamti, Bhyakure and Ghyampe bridges.
- Procurement for 3 bridges of Pilot Project was conducted June 2021, and there were more than 10 bids of each bridges. Sindhuli Road Project Office is now conducting evaluation and contract of each bridges will be concluded in August 2021. Construction will be started from September 2021.
- Environmental study was started from January 2020 for obtain approval of IEE Report by MOPIT before commencement of the construction. However, due to the fact that a new version of EPR 2020 (Environmental Protection Rules by the Ministry of the Environment) regarding the environmental survey process has not been released, and due to the lock down and movement restrictions by COVID-19 started from the end of March 2020, the environmental survey was suspended their activity for the time being. After that, with the release of the new EPR 2020 in September 2020 and the approval of the new template for TOR of Brief Environmental Study (IEE was changed to BES) in early December 2020, a new TOR was submitted at end of December 2020. TOR was finally approved by MOPIT on 14th of June 2021, and taking further action for IEE Study is required.
- Manual preparation about site investigation, planning and design method for RC continuous slab bridge starts from June 2020 and will be continued upto the end of December 2021.

1-3 Achievement of Output

(1) Achievement of Output - 1

- The work plan was confirmed among the JET and C/Ps.
- Annual allocated budget in ARMP for FY2019/2020 was confirmed in the 2nd JCC Meeting, and the budget for FY 2020/2021 was confirmed at the 4th JCC Meeting on 21st December 2020. The budget for the FY 2021/2022 was confirmed at the 5th JCC Meeting on 30th July 2021.
- To establish a basic policy for partial widening, JET submitted to DOR a technical report of "Preliminary Survey Report for The Road Improvement Plan" on 18th March 2020.
- RBN started toll collection from 18th September 2019 in separate 2 sections of Dhulikhel - Khurkot and Khurkot - Bardibas in accordance with Nepal gazette published on 15th April 2019
- Held monthly meeting and joint site patrol regularly.

(2) Achievement of Output - 2

- Traffic accident record from 2011 to 2021 was collected through traffic police.
- 35 number of schools along the Sindhuli Road are selected as a target of safety education.
- Additional EIS location was determined as 2 places in Khurkot
- First traffic survey was conducted in June 2019.

No.	Survey items	Contents
1	Traffic Count	・ Road side count @ 6 locations ・ 24 hrs / 2 weekdays & 1 weekend
2	Origin-Destination	・ Interviewing @ 3 locations ・ 6:00 – 22:00 / 1 weekday
3	Travel Speed	・ Measuring travel time ・ 2 routes (BP Hw. vs. Prithivi Hw.)

- Concept and candidate site of Rest Area were proposed near the Khurkot bus terminal.

(3) Achievement of Output - 3

- Target site and structure type was determined as below

No.	Candidate Sites		Selected Type of Bridge
1	STA. 1+400	Ghyampe Bridge	PC Post-tensioned T-girder (cast-in-situ) bridge (40m)
2	STA. 3+900	Mamti Bridge	RC continuous Slab (cast-in-situ) bridge (40m)
3	STA. 9+700	Bhyakure Bridge	PC Post-tensioned T-girder (cast-in-situ) bridge (40m)

- Topographic and geological surveys were conducted
- Detailed design of the three bridges was completed.

- Environmental study was started from January 2020 for obtain approval of BES Report, and TOR was finally approved by MOPIT on 14th of June 2021.
- Procurement of 3 bridges were conducted. There were more than 10 bid of each bridges.

1-4 Achievement of the Project Purpose

- In-progress toward achievement of the project purpose.

1-5 Changes of Risks and Actions for Mitigation

- Sunkoshi Marin Diversion Multipurpose Project

According to the explanation on 2nd JCC meeting about Sunkoshi Marin Diversion Multipurpose Project (SMDMP) which was started by DWRI, it is to be assumed that some part of Sindhuli Road comes under inundation permanently after construction of this project. To maintain the sufficient functions of the Sindhuli Road, proper detour road planning and design is required.

- Road Widening

DOR is planning to widen the width of the road at each section, and request for technical assistance was made to JET. After the consultation with JICA, JET replied to DOR that hasty road widening was not recommended, and DOR should plan it with the priority as follows;

Priority1: Section I (Relatively easier to widen the road than other section, but the part should be limited)

Priority2: Section IV (The Project will provide technical assistance for partial widening for traffic safety)

Priority3: Section II & III (Technically difficult, so it must be thoroughly examined before proceeding)

- Mitigation Measures against COVID-19

In order to mitigate the effect of COVID-19 pandemic, every protocol issued to the public by the Government, such as wearing mask, taking temperature and keeping social distance, shall strictly be followed through the Project's activities.

1-6 Progress of Actions undertaken by JICA

- JICA approved the replacement of Mr. Irino, who was in charge of "Coordination, Procurement and Social Environmental Analysis", and his successor is Ms. Sagawa from Nippon Koei, from the month of April 2020.
- JICA has approved home assignment of Japanese members among JET in response to the travel restriction due to COVID-19 pandemic after the month of April 2020.
- JICA approved to appoint Mr. Rana, who is one of JET, as a "Project Coordinator" in addition to the current position as "Traffic Safety Measures/ Traffic Safety Education", in order to undertake a role of smooth communication under the situation of remote assignment period.
- based on mutual agreement in the 4th JCC Meeting regarding the extension of the project period,

Record of Discussions (R/D) was amended at 18th February 2021.

- 8th JCC meeting is added regarding the extension of the project period.

1-7 Progress of Actions undertaken by Gov. of Nepal

- There was a replacement of the engineers from SDDSBRP (Suryabinayak-Dhulikhel, Dhulikhel-Sindhuli-Bardibas Road Project), DOR. Currently appointed only one engineer is below. Dispatching sufficient number of engineers is required for covering the PDM activities.
- Construction of the three (3) bridges shall be executed in accordance with the implementation plan approved by the 4th JCC Meeting.
- Two biddings of Hybrid ETC system were announced on September 16th, 2020. Evaluation process is currently on-going.

1-8 Progress of Environmental and Social Considerations (if applicable)

- As described in (3) Progress of Activities for Output - 3.

1-9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

- None

1-10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

- The revision of the JET assignment schedule was proposed and accepted as of Oct. 2020. The schedule of sub-activities will be revised accordingly.
- The Project have been collaborating with below ongoing JICA PPP projects / Survey;
  - Feasibility Survey for Traffic Safety Measures using Luminescence Gage Guidance Technology in Nepal
  - Collaboration Program with the Private Sector for Disseminating Japanese Technology for Environmentally friendly Slope Restoration by using Soil Algae through Biological Soil Crust (BSC) in Nepal

2　Delay of Work Schedule and/or Problems (if any)

2-1 Detail

- Due to COVID-19 pandemic, the 3rd JCC meeting scheduled on 25th March 2020 was canceled and the JICA experts hurriedly returned to Japan on 22nd March in accordance with the instruction from the headquarters of JICA on 18th March. After that, JET is continuing to be involved only by remote communication with the Nepalese side.

2-2 Cause

- The globally spreading COVID-19 is seriously affecting any economic activity.

2-3 Action to be taken

- In the 4th JCC Meeting, both parties agreed to extend the period of SROM2 with the conditions written in the Minutes of Meeting of the 4th JCC Meeting.

- In order to mitigate the effect of COVID-19 pandemic, every protocol issued to the public by GoN, such as wearing mask, taking temperature and keeping social distance, shall strictly be followed accordingly through the Project's activities.

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Nepal, etc.)

- With regard to the implementation of the pilot project conducted with DOR funds, the roles of JICA, DOR, DWRI and JET were clarified and confirmed in the Minutes of Meeting. DOR is required to make efforts to develop maintenance and management capacity under their own initiative in cooperation with JICA and JICA Expert Team by utilizing this opportunity.
- After obtaining an internal approval in DOR and JICA regarding the extension of the project period, Record of Discussions (R/D) should be amended.
- Record of Discussions (R/D) was amended in February 2021.
- JET hires environmental engineers for the IEE approval process.

3 Modification of the Project Implementation Plan

3-1 PDM/PO

- If the expansion of COVID-19 affects the progress of the project seriously, the PO modification may be necessary.
- One of "Objectively Verifiable Indicators" of the project overall goal that had been not yet determined is established with mutual confirmation as "Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023".
- Based on the discussion in the 4th JCC meeting, duration of the project has changed from 3 years to 4 years due to COVID-19 pandemic.
- Regarding the decision of extension of project period, 8th JCC meeting is added.

3-2 Other modifications on detailed implementation plan

- As DOR agreed to construct three (3) bridges, namely Mamti, Bhyakure and Ghyampe, as Pilot Project at the cost of DOR as per the Minutes of Meeting on August 28, 2019. DOR will implement three (3) bridges, however, due to the budget constrain caused by COVID-19, DOR decided to implement the procurement of contractor including the mobilization for three (3) bridges based on the available budget for FY2020/21. Actual construction will start at the end of rainy season in 2021 after securing the budget of FY2021/22. Construction of the three (3) bridges shall be executed in accordance with the implementation plan approved by the 4th JCC Meeting.
- Procurement of 3 bridges was conducted June 2021 and there were more than 10 bid of each bridges. Contract of each bridges will be concluded in August 2021, and construction will be started from September 2021.

4 Preparation of Gov. of Nepal toward after completion of the Project

- -

II. Project Monitoring Sheet I & II *as Attached*

III. Reference Documents

1. Implementation Report on The Technical Training on "Asphalt Concrete Mix Design and Quality Control in Pavement Construction", March 2021

Ver. 6

Project Monioring Sheet I

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal
Implementing Agency: Department of Roads (DOR), Department of Water Resources and Irrigation (DWRI) and Roads Board Nepal (RBN)
Target Group: Staff members of DOR, DWRI and RBN
Period of Project: Apr 2019 - Mar 2023 (48 months)
Project Site: Sindhuli Road

Version_6
Dated March 9. 2022

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
The safe and smooth road traffic along the Sindhuli Road is maintained.	1. Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023.	1. Traffic accident report by the Sindhuli Road Maintenance Unit (SRMU)/Traffic data by the SRMU	The policy and direction on the road operation and maintenance are not drastically changed by the Government of Nepal (GON).	Set a target indicator that was not yet determined (Ver.2)	Traffic volume and demand is being influenced by COVID-19 pandemic. observation of future change is required.
	2. Road users' satisfaction to road maintenance and safety management and performance in all sections reaches 4.0 points in average.	2. Interview result of road users based on the traffic survey by the SRMU		-	
	3. DOR operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road effectively in cooperation with DWRI and RBN.	3-1. An execution rate of road maintenance budget allocated by RBN and DOR for Sindhuli Road		-	
		3-2. Road inventory, disaster and maintenance records		-	
		3-3. Operation and maintenance records of EIS		-	
		3-4. Records of road safety countermeasures in the Road Safety Management Plan		-	
	4. DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWRI.	4. Records of road disasters and road maintenance		-	
Project Purpose					
The overall operation and maintenance system of the Sindhuli Road is strengthened.	1. A road closure caused by disasters does not continue for more than one day unless unexpected situation happens.	1. Road maintenance record and hazard record	1. Road safety awareness campaign is conducted by various agencies such as Department of Transport Management, Traffic Police, media and other related agencies.	-	
	2. Surface distress index (SDI) on Sindhuli road keeps in less 2 point (in good condition) through a whole year.	2. SDI record, Disaster record, Road maintenance record, Annual Work Plan			
	3. A cooperative framework and the division of the responsibilities between DOR and DWRI at the Ministry level are institutionalized.	3. Agreement between DOR and DWRI at the Ministry level	2. The budget and personnel necessary for the road operation and maintenance are to be allocated continuously.		
Outputs					
1. Capacity to operate and maintain the Sindhuli Road is improved.	1-1. Routine, recurrent and periodic maintenance are conducted properly in accordance with the Annual Road Maintenance Plan (ARMP).	1-1-1. Maintenance budget allocated from RBN and DOR 1-1-2. An execution rate of the maintenance budget 1-1-3. Record of road maintenance			
	1-2. Specific and emergency maintenance for disaster including emergency response is conducted timely and properly.	1-2. Operation record of maintenance machineries including emergency equipment supplied by JICA			
	1-3. Toll collection system is introduced in the Sindhuli Road in cooperation with DOR and RBN.	1-3. Toll collection system plan in the Sindhuli Road		Toll collection was started from Sep. 2019.	
2. Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.	2-1. Emergency Information System (EIS) is operated and managed properly in sustainable manner.	2-1. Operation and maintenance record of EIS			
	2-2. Road safety management is undertaken in accordance with the Road Safety Management Plan.	2-2. Road Safety Management Plan			
	2-3. Awareness and education activities of traffic safety are undertaken by using the developed education materials.	2-3. Education materials of road safety and record of awareness and education activities			
3. Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.	3-1. The Pilot Project for restoration of the damaged causeway is undertaken and completed in cooperation with DOR and DWRI.	3-1. Implementation schedule of the pilot project		Construction of 3 pilot projects has started since end of September 2021. Procurement was conducted for 3 Bridges of Pilot PJT. There was more than 10 bid of each bridges.	
	3-2. The Project related issues including causeway disaster countermeasures are presented by individual counterpart at the workshops and the Joint Coordinating Committee (JCC) meetings.	3-2. Results of seminars and workshops, a manual and training reports		Technical Training on Asphalt Concrete Mix Design and Quality Control in Pavement Construction was held on Feb. 2021.	

Activities	Inputs		Important Assumption
	The Japanese Side	The Nepalese Side	
1-1. Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN 1-2. Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2 1-3. Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project 1-4. Update the hazard map and road inventories of the Sindhuli Road 1-5. Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP 1-6. Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening 1-7. Conduct countermeasure works against water induced disasters beyond the right of way by DWRI 1-8. Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN 1-9. Convene regular meetings and monitoring for road operation and maintenance	1. Japanese experts - Chief advisor/Road administration - Deputy Chief Advisor/RoadO/M Planner - Road Structure Planner - Traffic safety Measure/Traffic Safety Education - Pavement Quality Control - Hydrologic Analysis/Flood Control - Road Structural Design - Road Disaster Prevention/EIS - Toll Road System/Pre-F/S of Rest Rrea - Coordination/Procurement/Social Evirmental Analysis 2. Pilot project for restoration of causeway disaster 3. Training in Japan or/and the third countries 4. In country training (technical study tour) 5. Local expenses for the Project activities	1. Counterpart Personnel (C/P) 【DOR】 - Project Director - Project Manager - Engineer - Sub-Engineer 【DWRI】 - Senior Divisional Hydrogeologist - River Disaster Expert (Civil Engineer) 【RBN】 - Senior Engineer 2. Expenses for the related Project activities and others specified in Basic Principles for Technical Cooperation 【DOR】 -Expense for operation and maintenance, and other safety measures of the Sindhuli Road 【DWRI】 -Expense for water induced disaster management works beyond the right of way 【RBN】 -Expense for introduction of the toll collection system 3. Provision of 4-WD vehicle for the site visit 4. Others	
2-1. Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents 2-2. Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan 2-3. Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users 2-4. Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local authorities 2-5. Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.) 2-6. Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities 2-7. Conduct a sharing workshop on road traffic safety 2-8. Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road			**Pre-Conditions** Most of the counterparts who were trained by the Phase 1 keep being deployed as counterparts of the Phase 2.
3-1. Conduct the site survey of the Sindhuli road and select the sites for pilot project 3-2. Conduct the natural condition surveys including EIA, topo. and geological investigations 3-3. Prepare the design, cost estimation and tender documents for the pilot project 3-4. Implementation of the pilot project in collaboration with DWRI 3-5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project 3-6. Prepare the manual about the planning, investigation and design method of the causeway rehabilitation 3-7. Conduct a sharing workshops on pilot project 3-8. Conduct a technical study tour in Nepal			**<Issues and countermeasures>**

Project Monitoring Sheet II

Version_6　　**Dated March 9. 2022**

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal

Inputs	Year	1st Year: 2019/2020	2nd Year: 2020/2021	3rd Year: 2021/2022	4th Year: 2022/2023	Remarks	Monitoring: Issue	Monitoring: Solution
		I II III IV	I II III IV	I II III IV	I II III IV			
		4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3			
Expert								
1. Chief Advisor/Road Administration	Plan					: Home assingment in Japan		
	Actual							
2. Deputy Chief Advisor/ Road O/M Planner 1	Plan							
	Actual							
3. Road Structure Planner	Plan					Replaced to Mr. Hayakawa		
	Actual							
4. Traffic Safety Measures/ Traffic Safety Education	Plan							
	Actual							
5. Pavement Quality Control	Plan							
	Actual						Due to COVID-19 impact,from April 2019 to November 2021, assignment of Japanese Experts was suspended.	
6. Hydrologic Analysis/ Flood Control	Plan							
	Actual							MM was shifted after April 2021 or partially consume by home assignment (in Japan)
7. Road Structural Design (Causeway)	Plan							
	Actual							
8. Road Disaster Prevention/ EIS	Plan							
	Actual							
9. Toll Road System/ Pre-F/S of Rest Area	Plan							
	Actual							
10. Coordination/ Procurement/ Social Environmental Analysis	Plan							
	Actual							
11. Road O/M Planner 2	Plan							
	Actual							
Total	Plan							
	Actual							
Equipment								
To be determined	Plan						To be determined	
	Actual							
Training in Japan								
November 3 – November 16, 2019. (14 days)	Plan							
	Actual					Completed successfully		
Training Tour								
Technical Training on Asphalt Concrete Mix Design and Quality Control in Pavement Construction	Plan						Asphalt concrete mix design-seminar was held February 2021 and finished successfully.	
	Actual							

Activities / Sub-Activities		Year	1st Year	2nd Year	3rd Year	3rd Year	Responsible Organization: Japan	Responsible Organization: Nepal	Achievements	Issue & Countermeasures
			I II III IV	I II III IV	I II III IV	I II III IV				
Output 1: Capacity to operate and maintain the Sindhuli Road is improved.										
1.1 Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN		Plan					JICA Expert	SRMU	Work Plan was confirmed	
		Actual								
1.2 Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2	✓ ✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU	Annual allocated budget for 2020/2021 was confirmed	Budget consuption progress is to be discussed
		Actual								
1.3 Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project	✓ ✓ ✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU, SRDMU, RBN		
		Actual								
1.4 Update the hazard map and road inventories of the Sindhuli Road	✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU		
		Actual								
1.5 Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP	✓ ✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU	Various maintenance works are On-Going	
		Actual								
1.6 Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening	✓ ✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU	Overlay work of Sec. IV in FY 2021/2022 is now procuring. Overlay work will be done within FY 2021/2022. Heavy overlay damage has confirmed between Dhulikhel - Patalekhet where overlay work was done 2 years ago. Basic plan of partial widening is established.	Reconstruction of Dhulikhel - Patalekhet overlay work was proposed. Quality control and implementation plan is to be discussed,
		Actual								
1.7 Conduct countermeasure works against water induced disasters beyond Right of Way by DWRI	✓ ✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRDMU	Target site selection is in progress	To be discussed with DWRI
		Actual								
1.8 Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN	✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU, RBN	Toll system was introduced while contractor procurement is remained	Introduction plan of HETC is to be discussed among related parties.
		Actual								
1.9 Convene regular meetings and monitoring for road operation and maintenance	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU, SRDMU, RBN	Held monthly meeting and joint site patrol	Only online communication due to COVID-19.
		Actual								
Output 2: Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.										
2.1 Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents	✓ ✓	Plan					JICA Expert	SRMU	Collected the accident record from 2011 to 2019	Checking accuracy and analyzing data of 2019
		Actual								
2.2 Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan	✓ ✓ ✓	Plan					JICA Expert	SRMU	Overall improvement planning are in progress. Concrete block installation and painting works are On-Going	Safety instrument installation should be proceeded based on its prioritization.
		Actual								
2.3 Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users	✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU	Additional RIB was installed at Khurkot	Comprehensive handover plan should be discussed among DOR
		Actual								
2.4 Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local administration	✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU		
		Actual								
2.5 Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.)	✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU	Traffic Survey was conducted in June 2019	Next traffic Survey is planned in June 2020
		Actual								
2.6 Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities	✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU	Target schools are selected and education material preparation is in progress	Framework and schedule of activities should be determined.
		Actual								
2.7 Conduct a sharing workshop on road traffic safety	✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU		
		Actual								
2.8 Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road	✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU	Concept and candidate site was established	
		Actual								
Output 3: Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.										
3.1 Conduct the site survey of the Sindhuli road and select the sites for pilot project	✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU, SRDMU	Target site was confirmed	
		Actual								
3.2 Conduct the natural condition surveys including EIA, topo. and geological investigations	✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU, SRDMU	Topographic and geological surveys were conducted.	
		Actual								
3.3 Prepare the design, cost estimation and tender documents for the pilot project including tender assistant	✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU, SRDMU	Design is approved. Procurement was conducted and there were more than 10 bid of each bridges.	Tender documents will be finalized in two month.
		Actual								
3.4 Implementation of the pilot project in cooperation with DWRI	✓ ✓ ✓	Plan					JICA Expert	SRMU, SRDMU	Construction of 3 pilot projects has started since end of September 2021. Japanese experts are difficult to monitor progress of pilot project due to COVID-19 restriction. Confimed that DWRI will conduct river training.	Monthly drone video shooting of the site is using as remote monitoring system for progress report.
		Actual								
3.5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project	✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU, SRDMU	Modality of technical assistance in C/S is to be discussed.	
		Actual								
3.6 Prepare the manual about the planning, investigation and design method of the causeway rehabilitation	✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU, SRDMU	Partial manual preparation is conducting by home assingment.	
		Actual								
3.7 Conduct a sharing workshops on pilot project	✓ ✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU, SRDMU		
		Actual								
3.8 Conduct a technical study tour in Nepal	✓ ✓ ✓ ✓ ✓	Plan					JICA Expert	SRMU, SRDMU	Asphalt concrete mix design-seminar was held February 2021 and finished successfully.	
		Actual								
Duration / Phasing		Plan	Phase 2-1 (18 months)	Phase 2-2 (18 months)						
		Actual								

Monitoring Plan	Year	1st Year: 2019/2020	2nd Year: 2020/2021	3rd Year: 2021/2022	4th Year: 2022/2023	Remarks	Issue	Solution
		I II III IV	I II III IV	I II III IV	I II III IV			
Monitoring								
Joint Coordinating Committee (JCC) Meeting	Plan	✓ ✓ ✓	✓ ✓	✓ ✓ ✓	✓ ✓ ✓	The 6th JCC will be held in December 2021. 8th JCC was added regarding with extension of the Project period.	Project is proceeding by remote communication.	JCC is held by using online video meeting.
	Actual	✓ ✓ ✓	✓ ✓	✓ ✓ ✓	✓			
Set-up the Detailed Plan of Operation	Plan	✓						
	Actual	✓						
Submission of Monitoring Sheet	Plan	✓ ✓ ✓	✓ ✓	✓ ✓ ✓	✓ ✓ ✓		To be confirmed by remote communication	MS ver.6 will be submitted in March 2022
	Actual	✓ ✓	✓ ✓	✓ ✓	✓			
Monthly Meeting	Plan	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓		Held only month that mojor experts are staying	
	Actual	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓			
Monitoring Mission from Japan	Plan							
	Actual							
Joint Monitoring	Plan							
	Actual							
Post Monitoring	Plan							
	Actual							
Reports/Documents								
Work Plan of Phase 2	Plan	✓					None	
	Actual	✓						
Project Completion Report	Plan				✓			
	Actual							
Public Relations								
Details to be determined	Plan							
	Actual							
	Plan							
	Actual							

SRMU: Sindhuli Road Maintenance Unit (under DOR)　SRMU: Sindhuli Road Maintenance Unit (under DOR)

SRDMU: Sindhuli Road Disaster Management Unit (unde　SRDMU: Sindhuli Road Disaster Management Unit (under DWRI)

TO CR of JICA NEPAL OFFICE

PROJECT MONITORING SHEET Ver.6 (Mar. 2022)

Project Title:
The Project for the Operation and Maintenance of the Sindhuli Road Phase 2
Version of the Sheet: Ver.6

Name: Ram Hari Pokharel
Title: DDG of DCID, DOR
Name: Hiroki Shinkai
Title: Chief Advisor / Road Administration
Submission Date: 14th March 2022

I. Summary

1 Progress

1-1 Progress of Inputs

(1) Experts

As of 14th March, 2022

	Position	*Name*	*Plan MM*	*Accumulated MM*
1	Chief Advisor / Road Administration	Hiroki SHINKAI	19.10	14.98
2	Deputy Chief Advisor/ Road O/M Planner 1	Motoki IWAMARU	18.30	13.22
3	Road Structural Planner	Hiroshi FUJISAWA	13.25	13.22
4	Road Structural Planner	Tomokuni HAYAKAWA	4.85	2.70
5	Traffic Safety Measures/ Traffic Safety Education / Project Coordinator	Bindu Shamsher RANA	11.30	8.75
6	Pavement Quality Control	Izumi MIDORIKAWA	5.90	4.15
7	Hydrologic Analysis/ Flood Control	Khadananda LAMSAL	1.00	1.00
8	Road Structural Design	Ramesh Prasad KOIRALA	7.10	5.50
9	Road Disaster Prevention/ EIS	Akhilesh Kumar KARNA	3.90	3.35
10	Toll Road System/ Pre-F/S of Rest Area	Kiyoshi NARITA	3.60	3.00
11	Coordination/ Procurement/ Social Environmental Analysis	Keita IRINO	1.00	1.00
12	Coordination/Procurement	Natsuko SAGAWA	2.80	1.30
13	Road O/M Planner 2	Hikaru TANAKA	1.00	1.00
		Total	93.10	73.17

(2) Equipment

As of 14th March, 2022

	Item	Quantity	Status
1	Network HDD	1 set	Purchased
2	Projector	1 set	Purchased
3	Camera	1 set	Purchased
4	Multifunction printer	1 set	Purchased
5	Computer	3 set	Purchased
6	Anti-virus software	9 set	3 Purchased
7	Auto CAD LT	3 set	Ordered 1 license for 1-year subscription from May 2019.
8	Acrobat	1 set	To be purchased
9	Uninterruptible power system	3 set	Purchased
10	Inkjet Printer	1 set	To be purchased
11	Furniture	1 set	Purchased

(3) Training in Japan

- Date: 3rd November – 16th November 2019 (14 days)
- Participant: DOR 6, RBN 2, DWRI 1 (Total 9)
- Program:
  - Toll road system & toll collection system
  - Traffic safety and emergency facilities
  - Road disaster prevention / countermeasure technology (incl. frontier technology such as AI and VR)
  - Infrastructure maintenance technology and asset management
  - Pavement technology
  - Contract management of maintenance work
  - Long mountainous tunnel construction technology
  - Preparation of the action plan and presentation

(4) Training Tour in Nepal

Technical training on asphalt concrete mix design and quality control in pavement construction was held on February 2021 as a part of "Training tour" and finished successfully.

- Date: 14th February – 18th February 2021 (5days)
- Participant: 13 trainees from DOR
- Program:

Day1	• Pavement condition of Sindhuli Road Project • Introduction of flexible/bitumen pavement • Selection of binder • Test of aggregates and binder • Marshall procedure of mix design • Determination of job mix formula

	• Test of aggregates and binder
Day2	• Interpretation of test results • Determination of theoretical grading • Selection of mix proportion and preparation of different mixes • Marshall procedures and necessary tests of marshall specimens
Day3	• Field visit to batching plant in Bhaktapur and Sindhuli Road upto Mulkot bends
Day4	• Marshall stability, flow test and interpretation of test results • Mix design calculation, determination of job mix formula of mix design and finalization of optimum bitumen content (OBC)
Day5	• Presentation and submission of mix design calculation and discission of results • Group discussion

- Necessary precaution as per COVID-19 protocol was maintained during the whole training program.

1-2 Progress of Activities

(1) Progress of Activities for Output - 1

- Various maintenance works such as routine, recurrent, periodic, specific, and emergency are On-Going.
- Overlay works for Sec. IV are On-Going. JICA Expert is going provide technical assistance for quality control of pavement works by DOR. It will be done within FY 2021/2022.
- Heavy overlay damage has confirmed between Dhulikhel – Patalekhet where overlay work was done 5 years ago. JICA Expert Team (hereinafter referred to JET) suppose DOR for the reconstruction of it.
- Above mentioned matter was confirmed by DOR and overlay works in FY 2021/2022 is now procuring as of March 2022.
  1. Section IV (CH158+000-160+000:5km) Pavement improvement construction is under procuring from Dhulikhel – Patalekhet.
  2. Section IV (CH130+000-136+000:6km) Overlay construction is under procuring from Dapcha Br. – Roshi Br.
  3. Section III (CH100+500-110+000:27km) Overlay construction is under procuring by WB fund.
  4. Section II (Khurkot – Sindhuli Bazar: 37km) Overlay works has completed.
  5. Section I (CH6+400-20+000:24km) Overlay construction is under procuring from Bardibas – Kamala Br.
  6. Section I (Bardibas – CH6+400:6km) Overlay work is constructing.
- Overlay works and pavement improvement works are constructing or under procuring. By the end of FY 2021/2022, overlay condition of whole Sindhuli road expects to improve.
- Toll collection for the first section (Dhulikhel - Khurkot) is temporarily done with help of DOR instead of contractors which are to be procured by RBN, and the second section (Khurkot - Bardibas) is done by the contractor which was already awarded. Retender of the first section will be proceeded after revising traffic volume assumption. However, toll collection by the above system is being suspended from March

2020 due to COVID-19.

- Hybrid Electronic Toll Collection (HETC) is going to be replaced to the traditional type of toll collection system and RBN is willing to install HETC as a pilot project in technical support of JICA. Two separate biddings were ordered for the introduction of HETC. One is the construction of toll plaza. Another is the construction of administration office and the development of HETC system, etc. Bid of theses construction were announced September 2020 and evaluation process is currently on-going.
- HETC system will be introduced under the supervision of a local consultant hired by RBN. After selecting contractor of the HETC, scope of the technical support by JET will be discussed with RBN and local consultant.
- At 6th JCC meeting, ED of RBN has requested DOR and JICA to organize a stakeholder meeting for technical support of HETC.

(2) Progress of Activities for Output - 2

- Traffic accident record from 2011 to 2021 was collected through traffic police. Result of its analysis will be effectively utilized in plan of traffic safety measures.
- Installation and painting of guardrails (Crash barriers), guard blocks and delineators are in progress. It is recommended that further safety instrument installation should be proceeded taking into consideration the above traffic accident record.
- None of the Road Information Boards of EIS was being updated, and it needs to update and popularize the EIS web site so that users can get update regarding the road situation. JET advised SDDSBR about improvement of operation system and improvement plan is in progress.
- Proposal for Improvement of EIS (with cost estimation and drawings) and proposed contract document for maintenance of EIS (with cost estimation) were submitted to DOR in July 2020. Based on this document, a contractor has been procured and the installation of a new RIB has been completed in Khurkot area in November 2021.
- JET recommends organizing a short (half-day) workshop among the concerned DOR offices. However due to spread of COVID-19, schedule of short workshop has not decided yet.
- Teacher training for road safety awareness is planned for early June 2022. It will be held in Bhakundebesi (Sec. III and Sec IV) and Sindhuli bazar (Sec I and secII). The preparation of traffic education materials is underway.

(3) Progress of Activities for Output - 3

- Through the series of discussion among DOR, JICA and JET, implementing conditions of the Pilot Projects for restoration of damaged causeways was confirmed, and all concerned party have signed the Minutes of Meeting on 26th September 2019. JET will provide technical assistance in the form of soft component and training component, which is expected to contribute to the sustainability of the project impact.

- Detailed design for three bridges was prepared by SDDSBR Project Office with support by JET, and it was completed to verify by DOR in the end of November 2020 and then abstract of the cost for three bridges were estimated in the early December 2020. SDDSBR Project office will start preparation for procurement of three packages for Mamti, Bhyakure and Ghyampe bridges.
- Procurement for 3 bridges of Pilot Project was conducted June 2021, and there were more than 10 bids of each bridges. Sindhuli Road Project Office is now conducting evaluation and contract of each bridges will be concluded in August 2021. Construction will be started from September 2021.
- Contractor of 3 pilot project had selected and construction has started since end of September 2021. JET gave instruction of S-Curve to contractor. S-Curve is a monitoring tool of construction progress and it is used as basic data of project progress monitoring.
- Monitoring activities of pilot projects are divided in 3 parts.
  1. Site progress monitoring by using Drone by JET (Once per month)
  2. Joint site survey between DOR-JET-Contractor (Once per month)
  3. Management meeting held by DOR (If necessary, within 1week after joint site survey)
- Environmental study was started from January 2020 for obtain approval of IEE Report by MOPIT before commencement of the construction. However, due to the fact that a new version of EPR 2020 (Environmental Protection Rules by the Ministry of the Environment) regarding the environmental survey process has not been released, and due to the lock down and movement restrictions by COVID-19 started from the end of March 2020, the environmental survey was suspended their activity for the time being. After that, with the release of the new EPR 2020 in September 2020 and the approval of the new template for TOR of Brief Environmental Study (IEE was changed to BES) in early December 2020, a new TOR was submitted at end of December 2020. TOR was finally approved by MOPIT on 14th of June 2021 and taking further action for IEE Study is required.
- Manual preparation about site investigation, planning and design method for RC continuous slab bridge starts from June 2020 and completed at the end of December 2021. As annex of the manual, typical drawings are under preparing and will be submitted end of April 2022.
- Training of design manual for RC Continuous Slab Bridge and knowledge sharing workshop is planning on August – September 2022.

1-3 Achievement of Output

(1) Achievement of Output - 1

- The work plan was confirmed among the JET and C/Ps.
- Annual allocated budget in ARMP for FY2019/2020 was confirmed in the 2nd JCC Meeting, and the budget for FY 2020/2021 was confirmed at the 4th JCC Meeting on 21st December 2020. The budget for the FY 2021/2022 was confirmed at the 5th JCC Meeting on 30th July 2021.
- To establish a basic policy for partial widening, JET submitted to DOR a technical report of "Preliminary Survey Report for The Road Improvement Plan" on 18th March 2020.

- RBN started toll collection from 18th September 2019 in separate 2 sections of Dhulikhel - Khurkot and Khurkot - Bardibas in accordance with Nepal gazette published on 15th April 2019
- Held monthly meeting and joint site patrol regularly.

(2) Achievement of Output - 2

- Traffic accident record from 2011 to 2021 was collected through traffic police.
- 35 number of schools along the Sindhuli Road are selected as a target of safety education.
- Additional EIS location was determined as 2 places in Khurkot, and installation of RIS was completed in November 2022.
- First traffic survey was conducted in June 2019.

No.	Survey items	Contents
1	Traffic Count	・ Road side count @ 6 locations ・ 24 hrs / 2 weekdays & 1 weekend
2	Origin-Destination	・ Interviewing @ 3 locations ・ 6:00 – 22:00 / 1 weekday
3	Travel Speed	・ Measuring travel time ・ 2 routes (BP Hw. vs. Prithivi Hw.)

- Concept and candidate site of Rest Area were proposed near the Khurkot bus terminal.

(3) Achievement of Output - 3

- Target site and structure type was determined as below

No.	Candidate Sites		Selected Type of Bridge
1	STA. 1+400	Ghyampe Bridge	PC Post-tensioned T-girder (cast-in-situ) bridge (40m)
2	STA. 3+900	Mamti Bridge	RC continuous Slab (cast-in-situ) bridge (40m)
3	STA. 9+700	Bhyakure Bridge	PC Post-tensioned T-girder (cast-in-situ) bridge (40m)

- Topographic and geological surveys were conducted
- Detailed design of the three bridges was completed.
- Environmental study was started from January 2020 for obtain approval of BES Report, and TOR was finally approved by MOPIT on 14th of June 2021.
- Procurement of 3 bridges were conducted. There were more than 10 bid of each bridge.
- Constructions of 3 pilot project have started since end of September 2021 and construction period will end September 2023.
- Planning and Design Manual for RC Continuous Slab Bridge(RCSB) ver.1 was submitted on December 2021.

1-4 Achievement of the Project Purpose

- In-progress toward achievement of the project purpose.

1-5 Changes of Risks and Actions for Mitigation

- Sunkoshi Marin Diversion Multipurpose Project

According to the explanation on 2nd JCC meeting about Sunkoshi Marin Diversion Multipurpose Project (SMDMP) which was started by DWRI, it is to be assumed that some part of Sindhuli Road comes under inundation permanently after construction of this project. To maintain the sufficient functions of the Sindhuli Road, proper detour road planning and design is required.

- Road Widening

DOR is planning to widen the width of the road at each section, and request for technical assistance was made to JET. After the consultation with JICA, JET replied to DOR that hasty road widening was not recommended, and DOR should plan it with the priority as follows;

Priority1: Section I (Relatively easier to widen the road than other section, but the part should be limited)

Priority2: Section IV (The Project will provide technical assistance for partial widening for traffic safety)

Priority3: Section II & III (Technically difficult, so it must be thoroughly examined before proceeding)

- Mitigation Measures against COVID-19

In order to mitigate the effect of COVID-19 pandemic, every protocol issued to the public by the Government, such as wearing mask, taking temperature and keeping social distance, shall strictly be followed through the Project's activities.

1-6 Progress of Actions undertaken by JICA

- JICA approved the replacement of Mr. Irino, who was in charge of "Coordination, Procurement and Social Environmental Analysis", and his successor is Ms. Sagawa from Nippon Koei, from the month of April 2020.
- JICA has approved home assignment of Japanese members among JET in response to the travel restriction due to COVID-19 pandemic after the month of April 2020.
- JICA approved to appoint Mr. Rana, who is one of JET, as a "Project Coordinator" in addition to the current position as "Traffic Safety Measures/ Traffic Safety Education", in order to undertake a role of smooth communication under the situation of remote assignment period.
- based on mutual agreement in the 4th JCC Meeting regarding the extension of the project period, Record of Discussions (R/D) was amended at 18th February 2021.
- 8th JCC meeting is added regarding the extension of the project period.
- JICA approved the replacement of Mr. Fujisawa, who was in charge of "Road Structure Planner", and

his successor is Mr. Hayakawa from Nippon Koei, from the month of October 2021.

➢

1-7 Progress of Actions undertaken by Gov. of Nepal

- There was a replacement of the engineers from SDDSBRP (Suryabinayak-Dhulikhel, Dhulikhel-Sindhuli-Bardibas Road Project), DOR. Currently three number of engineers was appointed.
- Construction of the three (3) bridges shall be executed in accordance with the implementation plan approved by the 4th JCC Meeting.
- Two biddings of Hybrid ETC system were announced on September 16th, 2020. Evaluation process is currently on-going.

1-8 Progress of Environmental and Social Considerations (if applicable)

- As described in (3) Progress of Activities for Output - 3.

1-9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

- None

1-10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

- The revision of the JET assignment schedule was proposed and accepted as of Oct. 2020. The schedule of sub-activities will be revised accordingly.
- The Project have been collaborating with below ongoing JICA PPP projects / Survey;
  - Feasibility Survey for Traffic Safety Measures using Luminescence Gage Guidance Technology in Nepal
  - Collaboration Program with the Private Sector for Disseminating Japanese Technology for Environmentally friendly Slope Restoration by using Soil Algae through Biological Soil Crust (BSC) in Nepal
- As per the letter from DCID to JET with the ref. no DCID 10/2078-79/181 dated October 4th, 2021, expected construction periods of 3 pilot project exceed the service period of JICA Expert Team. On October 5th, 2021, JET sent a letter to DOR reminding them that JET's service period was determined based on the construction completion date of the Mamti Bridge at the time of the previous decision regarding the JET's service period extension

2　Delay of Work Schedule and/or Problems (if any)

2-1 Detail

- Due to COVID-19 pandemic, the 3rd JCC meeting scheduled on 25th March 2020 was canceled and the JICA experts hurriedly returned to Japan on 22nd March in accordance with the instruction from the headquarters of JICA on 18th March. After that, JET is continuing to be involved only by remote communication with the Nepalese side.

2-2 Cause

- The globally spreading COVID-19 is seriously affecting any economic activity.

2-3 Action to be taken

- In the 4th JCC Meeting, both parties agreed to extend the period of SROM2 with the conditions written in the Minutes of Meeting of the 4th JCC Meeting.
- In order to mitigate the effect of COVID-19 pandemic, every protocol issued to the public by GoN, such as wearing mask, taking temperature and keeping social distance, shall strictly be followed accordingly through the Project's activities.

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Nepal, etc.)

- With regard to the implementation of the pilot project conducted with DOR funds, the roles of JICA, DOR, DWRI and JET were clarified and confirmed in the Minutes of Meeting. DOR is required to make efforts to develop maintenance and management capacity under their own initiative in cooperation with JICA and JICA Expert Team by utilizing this opportunity.
- After obtaining an internal approval in DOR and JICA regarding the extension of the project period, Record of Discussions (R/D) should be amended.
- Record of Discussions (R/D) was amended in February 2021.
- JET hires environmental engineers for the IEE approval process.

3　Modification of the Project Implementation Plan

3-1 PDM/PO

- If the expansion of COVID-19 affects the progress of the project seriously, the PO modification may be necessary.
- One of "Objectively Verifiable Indicators" of the project overall goal that had been not yet determined is established with mutual confirmation as "Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023".
- Based on the discussion in the 4th JCC meeting, duration of the project has changed from 3 years to 4 years due to COVID-19 pandemic.
- Regarding the decision of extension of project period, 8th JCC meeting is added.

3-2 Other modifications on detailed implementation plan

- As DOR agreed to construct three (3) bridges, namely Mamti, Bhyakure and Ghyampe, as Pilot Project at the cost of DOR as per the Minutes of Meeting on August 28, 2019. DOR will implement three (3) bridges, however, due to the budget constrain caused by COVID-19, DOR decided to implement the procurement of contractor including the mobilization for three (3) bridges based on the available budget for FY2020/21. Actual construction will start at the end of rainy season in 2021 after securing the budget of FY2021/22. Construction of the three (3) bridges shall be executed in accordance with the implementation plan approved by the 4th JCC Meeting.

4 Preparation of Gov. of Nepal toward after completion of the Project

- -

II. Project Monitoring Sheet I & II *as Attached*

III. Reference Documents

1. Planning and Design Manual for RC Continuous Slab Bridge (RCSB), December 2021

Ver. 7

Project Monioring Sheet I

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal
Implementing Agency: Department of Roads (DOR), Department of Water Resources and Irrigation (DWRI) and Roads Board Nepal (RBN)
Target Group: Staff members of DOR, DWRI and RBN
Period of Project: Apr 2019 - Mar 2023 (48 months)
Project Site: Sindhuli Road

Version_7
Dated September 2. 2022

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
The safe and smooth road traffic along the Sindhuli Road is maintained.	1. Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023.	1. Traffic accident report by the Sindhuli Road Maintenance Unit (SRMU)/Traffic data by the SRMU	The policy and direction on the road operation and maintenance are not drastically changed by the Government of Nepal (GON).	Set a target indicator that was not yet determined (Ver.2)	COVID-19 pandemic after March 2020 influenced traffic volume, construction procurement and work performance. The above matter caused large impact on the verification of Overall Goal.
	2. Road users' satisfaction to road maintenance and safety management and performance in all sections reaches 4.0 points in average.	2. Interview result of road users based on the traffic survey by the SRMU		Road users' satisfaction was surveyed in 2019 and 2022 and the value was 3.53 on average.	
	3. DOR operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road effectively in cooperation with DWRI and RBN.	3-1. An execution rate of road maintenance budget allocated by RBN and DOR for Sindhuli Road		Financial progress of FY2019/2020, 2020/2021 & 2021/2022 was reported.	
		3-2. Road inventory, disaster and maintenance records		-	
		3-3. Operation and maintenance records of EIS		-	
		3-4. Records of road safety countermeasures in the Road Safety Management Plan		Existing Road Safety Management Plan was reviewed and updated.	
	4. DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWRI.	4. Records of road disasters and road maintenance		-	
Project Purpose					
The overall operation and maintenance system of the Sindhuli Road is strengthened.	1. A road closure caused by disasters does not continue for more than one day unless unexpected situation happens.	1. Road maintenance record and hazard record	1. Road safety awareness campaign is conducted by various agencies such as Department of Transport Management, Traffic Police, media and other related organizations	-	
	2. Surface distress index (SDI) on Sindhuli road keeps in less 2 point (in good condition) through a whole year.	2. SDI record, Disaster record, Road maintenance record, Annual Work Plan			
	3. A cooperative framework and the division of the responsibilities between DOR and DWRI at the Ministry level are institutionalized.	3. Agreement between DOR and DWRI at the Ministry level	2. The budget and personnel necessary for the road operation and maintenance are to be allocated continuously.		
Outputs					
1. Capacity to operate and maintain the Sindhuli Road is improved.	1-1. Routine, recurrent and periodic maintenance are conducted properly in accordance with the Annual Road Maintenance Plan (ARMP).	1-1-1. Maintenance budget allocated from RBN and DOR 1-1-2. An execution rate of the maintenance budget 1-1-3. Record of road maintenance		Maintenance budget and exexution rate were reported on JCC meeting.	
	1-2. Specific and emergency maintenance for disaster including emergency response is conducted timely and properly.	1-2. Operation record of maintenance machineries including emergency equipment supplied by JICA			
	1-3. Toll collection system is introduced in the Sindhuli Road in cooperation with DOR and RBN.	1-3. Toll collection system plan in the Sindhuli Road		Toll collection was started from Sep. 2019. Preliminary survey for installation of ETC has been started from May 2022.	
2. Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.	2-1. Emergency Information System (EIS) is operated and managed properly in sustainable manner.	2-1. Operation and maintenance record of EIS			
	2-2. Road safety management is undertaken in accordance with the Road Safety Management Plan.	2-2. Road Safety Management Plan		Road safety management is undertaken in accordance with the Road Safety Management Plan. The plan was updated as "Road Safety Improvement Plan " according to current traffic condition.	
	2-3. Awareness and education activities of traffic safety are undertaken by using the developed education materials.	2-3. Education materials of road safety and record of awareness and education activities		Training for school teachers was conducted June 2022. Equipment / materials were distributed to teachers. Traffic Safety Workshop will be held in late 2022.	
3. Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.	3-1. The Pilot Project for restoration of the damaged causeway is undertaken during the Project period in cooperation with DOR and DWRI.	3-1. Implementation schedule of the pilot project		Construction of 3 pilot projects has started since end of September 2021. Procurement was conducted for 3 Bridges of Pilot PJT. There was more than 10 bid of each bridges.	
	3-2. The Project related issues including causeway disaster countermeasures are presented by individual counterpart at the workshops and the Joint Coordinating Committee (JCC) meetings.	3-2. Results of seminars and workshops, a manual and training reports		Technical Training on Asphalt Concrete Mix Design and Quality Control in Pavement Construction was held on Feb. 2021. Domestic Technical Tour was conducted in June 2022. Workshop for pilot project will be conducted in October 2022. Manual about the planning, investigation and design method of the causeway rehabilitation was completed and submitted June 2022.	

Activities	Inputs		Important Assumption
	The Japanese Side	The Nepalese Side	
1-1. Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN 1-2. Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2 1-3. Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project 1-4. Update the hazard map and road inventories of the Sindhuli Road 1-5. Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP 1-6. Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening 1-7. Conduct countermeasure works against water induced disasters beyond the right of way by DWRI 1-8. Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN 1-9. Convene regular meetings and monitoring for road operation and maintenance 2-1. Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents 2-2. Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan 2-3. Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users 2-4. Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local authorities 2-5. Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.) 2-6. Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities 2-7. Conduct a sharing workshop on road traffic safety 2-8. Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road 3-1. Conduct the site survey of the Sindhuli road and select the sites for pilot project 3-2. Conduct the natural condition surveys including EIA, topo. and geological investigations 3-3. Prepare the design, cost estimation and tender documents for the pilot project 3-4. Implementation of the pilot project in collaboration with DWRI 3-5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project 3-6. Prepare the manual about the planning, investigation and design method of the causeway rehabilitation 3-7. Conduct a sharing workshops on pilot project 3-8. Conduct a technical study tour in Nepal	1. Japanese experts - Chief advisor/Road administration - Deputy Chief Advisor/RoadO/M Planner - Road Structure Planner - Traffic safety Measure/Traffic Safety Education - Pavement Quality Control - Hydrologic Analysis/Flood Control - Road Structural Design - Road Disaster Prevention/EIS - Toll Road System/Pre-F/S of Rest Rrea - Coordination/Procurement/Social Evirmental Analysis 2. Pilot project for restoration of causeway disaster 3. Training in Japan or/and the third countries 4. In country training (technical study tour) 5. Local expenses for the Project activities	1. Counterpart Personnel (C/P) 【DOR】 - Project Director - Project Manager - Engineer - Sub-Engineer 【DWRI】 - Senior Divisional Hydrogeologist - River Disaster Expert (Civil Engineer) 【RBN】 - Senior Engineer 2. Expenses for the related Project activities and others specified in Basic Principles for Technical Cooperation 【DOR】 -Expense for operation and maintenance, and other safety measures of the Sindhuli Road 【DWRI】 -Expense for water induced disaster management works beyond the right of way 【RBN】 -Expense for introduction of the toll collection system 3. Provision of 4-WD vehicle for the site visit 4. Others	**Pre-Conditions** Most of the counterparts who were trained by the Phase 1 keep being deployed as counterparts of the Phase 2. **<Issues and countermeasures>**

Project Monitoring Sheet II

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal

Version_7　　Dated September 2. 2022

Inputs	Year	1st Year: 2019/2020	2nd Year: 2020/2021	3rd Year: 2021/2022	4th Year: 2022/2023	Remarks	Monitoring: Issue	Monitoring: Solution
		I II III IV	I II III IV	I II III IV	I II III IV			
Expert								
1. Chief Advisor/Road Administration	Plan					: Home assingment in Japan	Due to COVID-19 impact,from April 2019 to November 2021, assignment of Japanese Experts was suspended.	MM was shifted after April 2021 or partially consume by home assignment (in Japan)
	Actual							
2. Deputy Chief Advisor/ Road O/M Planner 1	Plan							
	Actual					Mr. Hayakawa replaced Mr.Fujisawa in Oct. 2021		
3. Road Structure Planner	Plan							
	Actual							
4. Traffic Safety Measures/ Traffic Safety Education	Plan							
	Actual							
5. Pavement Quality Control	Plan							
	Actual							
6. Hydrologic Analysis/ Flood Control	Plan							
	Actual							
7. Road Structural Design (Causeway)	Plan							
	Actual							
8. Road Disaster Prevention/ EIS	Plan							
	Actual							
9. Toll Road System/ Pre-F/S of Rest Area	Plan							
	Actual							
10. ETC 1	Plan							
	Actual					ETC 1 and ETC 2 positions were added according to the strong request of ETC installation from ED of RBN.		
11. ETC 2	Plan							
	Actual							
12. Coordination/ Procurement/ Social Environmental Analysis	Plan							
	Actual							
13. Road O/M Planner 2	Plan							
	Actual							
Total	Plan							
	Actual							
Equipment								
To be determined	Plan						To be determined	
	Actual							
Training in Japan								
November 3 – November 16, 2019. (14 days)	Plan							
	Actual					Completed successfully		
Training Tour								
Technical Training on Asphalt Concrete Mix Design and Quality Control in Pavement Construction / Domestic Technical Tour at NTCP	Plan							
	Actual					Pavement seminar and technical tour at NTCP were finished successfully.		

Activities / Sub-Activities	Year	1st Year	2nd Year	3rd Year	3rd Year	Responsible Organization: Japan	Responsible Organization: Nepal	Achievements	Issue & Countermeasures
		I II III IV	I II III IV	I II III IV	I II III IV				
Output 1: Capacity to operate and maintain the Sindhuli Road is improved.									
1.1 Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN	Plan					JICA Expert	SRMU	Work Plan was confirmed	
	Actual								
1.2 Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2	Plan					JICA Expert	SRMU	Annual allocated budget for 2020/2021 was confirmed	Budget consuption progress is to be discussed
	Actual								
1.3 Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project	Plan					JICA Expert	SRMU, SRDMU, RBN		
	Actual								
1.4 Update the hazard map and road inventories of the Sindhuli Road	Plan					JICA Expert	SRMU		
	Actual								
1.5 Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP	Plan					JICA Expert	SRMU	Various maintenance works are On-Going.	
	Actual								
1.6 Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening	Plan					JICA Expert	SRMU	Overlay work of Sec. IV is now processing. Basic plan of partial widening is established. Heavy overlay damage has confirmed between Dhulikhel - Patalekhet where overlay work was done 2 years ago.	Reconstruction of Dhulikhel - Patalekhet overlay work was proposed. Quality control and implementation plan is to be discussed,
	Actual								
1.7 Conduct countermeasure works against water induced disasters beyond Right of Way by DWRI	Plan					JICA Expert	SRDMU	Target site selection is in progress	To be discussed with DWRI
	Actual								
1.8 Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN	Plan					JICA Expert	SRMU, RBN	Toll system was introduced while contractor procurement is remained	Introduction plan of HETC is to be discussed among related parties.
	Actual								
1.9 Convene regular meetings and monitoring for road operation and maintenance	Plan					JICA Expert	SRMU, SRDMU, RBN	Held monthly meeting and joint site patrol	Utilize online communication
	Actual								
Output 2: Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.									
2.1 Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents	Plan					JICA Expert	SRMU	Collected the accident record from 2011 to 2021	Checking accuracy and analyzing data
	Actual								
2.2 Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan	Plan					JICA Expert	SRMU	Overall improvement planning are in progress. Concrete block installation and painting works are On-Going	Safety instrument installation should be proceeded based on its prioritization.
	Actual								
2.3 Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users	Plan					JICA Expert	SRMU	Additional RIB was installed at Khurkot	Comprehensive handover plan should be discussed among DOR
	Actual								
2.4 Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local administration	Plan					JICA Expert	SRMU		
	Actual								
2.5 Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.)	Plan					JICA Expert	SRMU	Traffic Survey was conducted in June 2019. 2nd Traffic Survey was conducted in May 2022.	None
	Actual								
2.6 Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities	Plan					JICA Expert	SRMU	Road Safety Awareness Training for School Teachers was conducted in June 2022. Education equipments and materials were distributed to participated school teachers.	Workshop will be planned in late 2022.
	Actual								
2.7 Conduct a sharing workshop on road traffic safety	Plan					JICA Expert	SRMU		
	Actual								
2.8 Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road	Plan					JICA Expert	SRMU	Concept and candidate site was established	
	Actual								
Output 3: Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.									
3.1 Conduct the site survey of the Sindhuli road and select the sites for pilot project	Plan					JICA Expert	SRMU, SRDMU	Target site was confirmed	
	Actual								
3.2 Conduct the natural condition surveys including EIA, topo. and geological investigations	Plan					JICA Expert	SRMU, SRDMU	Topographic and geological surveys were conducted	
	Actual								
3.3 Prepare the design, cost estimation and tender documents for the pilot project including tender assistant	Plan					JICA Expert	SRMU, SRDMU	Contractors were procured.	
	Actual								
3.4 Implementation of the pilot project in cooperation with DWRI	Plan					JICA Expert	SRMU, SRDMU	Construction of 3 pilot projects has started since end of September 2021. Japanese experts are difficult to monitor progress of pilot project due to COVID-19 restriction. Confimed that DWRI will conduct river training.	Monthly drone video shooting of the site is using as remote monitoring system for progress report.
	Actual								
3.5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project	Plan					JICA Expert	SRMU, SRDMU	Regular monitoring system was established	
	Actual								
3.6 Prepare the manual about the planning, investigation and design method of the causeway rehabilitation	Plan					JICA Expert	SRMU, SRDMU	Manual was completed and submitted on June 2022.	
	Actual								
3.7 Conduct a sharing workshops on pilot project	Plan					JICA Expert	SRMU, SRDMU	to be held soon	to be discussed between DOR and JET
	Actual								
3.8 Conduct a technical study tour in Nepal	Plan					JICA Expert	SRMU, SRDMU	Asphalt concrete mix design-seminar was held February 2021 and finished successfully. Domestic Technical Tour at Nagdhunga Tunnel Construction Project was held June 2022 and finished successfully.	
	Actual								

Duration / Phasing		Phase 2-1 (18 months)	Phase 2-2 (18 months)
	Plan		
	Actual		

Monitoring Plan	Year	1st Year: 2019/2020	2nd Year: 2020/2021	3rd Year: 2021/2022	4th Year: 2022/2023	Remarks	Monitoring: Issue	Monitoring: Solution
		I II III IV	I II III IV	I II III IV	I II III IV			
Monitoring								
Joint Coordinating Committee (JCC) Meeting	Plan	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	The 7th JCC was held in August 2022.	Project is proceeding by remote communication.	JCC is held by using online video meeting.
	Actual	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓			
Set-up the Detailed Plan of Operation	Plan	✓						
	Actual	✓						
Submission of Monitoring Sheet	Plan	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓		To be confirmed by remote communication	MS ver.7 will be submitted in August 2022
	Actual	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓			
Monthly Meeting	Plan	✓✓✓✓✓✓✓✓✓✓✓✓	✓✓✓✓✓✓✓✓✓✓✓✓	✓✓✓✓✓✓✓✓✓✓✓✓	✓✓✓✓✓✓✓✓✓✓✓✓		Held only month that mojor experts are staying	
	Actual	✓✓✓✓✓ ✓ ✓✓	✓ ✓	✓ ✓	✓ ✓ ✓			
Monitoring Mission from Japan	Plan							
	Actual							
Joint Monitoring	Plan							
	Actual							
Post Monitoring	Plan							
	Actual							
Reports/Documents								
Work Plan of Phase 2	Plan	✓					None	
	Actual	✓						
Project Completion Report	Plan				✓			
	Actual							
Public Relations								
Details to be determined	Plan							
	Actual							
	Plan							
	Actual							

SRMU: Sindhuli Road Maintenance Unit (under DOR)　SRMU: Sindhuli Road Maintenance Unit (under DOR)

SRDMU: Sindhuli Road Disaster Management Unit (unde　SRDMU: Sindhuli Road Disaster Management Unit (under DWRI)

TO CR of JICA NEPAL OFFICE

PROJECT MONITORING SHEET Ver.7 (September 2022)

Project Title:
The Project for the Operation and Maintenance of the Sindhuli Road Phase 2
Version of the Sheet: Ver.7

Name: Ram Hari Pokharel
Title: DDG of DCID, DOR
Name: Hiroki Shinkai
Title: Chief Advisor / Road Administration
Submission Date: 2nd September 2022

I. Summary

1 Progress

1-1 Progress of Inputs

(1) Experts

As of 22nd August, 2022

	Position	Name	Plan MM	Accumulated MM
1	Chief Advisor / Road Administration	Hiroki SHINKAI	19.40	16.43
2	Deputy Chief Advisor/ Road O/M Planner 1	Motoki IWAMARU	18.50	15.22
3	Road Structural Planner	Hiroshi FUJISAWA	13.25	13.22
4	Road Structural Planner	Tomokuni HAYAKAWA	5.05	4.18
5	Traffic Safety Measures/ Traffic Safety Education / Project Coordinator	Bindu Shamsher RANA	11.30	9.95
6	Pavement Quality Control	Izumi MIDORIKAWA	5.90	4.15
7	Hydrologic Analysis/ Flood Control	Khadananda LAMSAL	1.00	1.00
8	Road Structural Design	Ramesh Prasad KOIRALA	7.10	6.55
9	Road Disaster Prevention/ EIS	Akhilesh Kumar KARNA	3.90	3.40
10	Toll Road System/ Pre-F/S of Rest Area	Kiyoshi NARITA	4.20	3.15
11	ETC 1	Noboru KONDO	1.20	0.05
12	ETC 2	Ryohei HAYASHI	1.50	0.05
13	Coordination/ Procurement/ Social Environmental Analysis	Keita IRINO	1.00	1.00
14	Coordination/Procurement	Natsuko SAGAWA	2.80	1.85
15	Road O/M Planner 2	Hikaru TANAKA	1.00	1.00

Total	97.10	81.20

(2) Equipment

As of 22nd August, 2022

	Item	*Quantity*	*Status*
1	Network HDD	1 set	Purchased
2	Projector	1 set	Purchased
3	Camera	1 set	Purchased
4	Multifunction printer	1 set	Purchased
5	Computer	3 set	Purchased
6	Anti-virus software	9 set	3 Purchased
7	Auto CAD LT	3 set	Ordered 1 license for 1-year subscription from May 2019.
8	Acrobat	1 set	To be purchased
9	Uninterruptible power system	3 set	Purchased
10	Inkjet Printer	1 set	Purchased
11	Furniture	1 set	Purchased

(3) Training in Japan

- Date: 3rd November – 16th November 2019 (14 days)
- Participant: DOR 6, RBN 2, DWRI 1 (Total 9)
- Program:

  - Toll road system & toll collection system
  - Traffic safety and emergency facilities
  - Road disaster prevention / countermeasure technology
    (incl. frontier technology such as AI and VR)
  - Infrastructure maintenance technology and asset management
  - Pavement technology
  - Contract management of maintenance work
  - Long mountainous tunnel construction technology
  - Preparation of the action plan and presentation

(4) Training Tour in Nepal

- Asphalt concrete mix design-seminar

Technical training on asphalt concrete mix design and quality control in pavement construction was held on February 2021 as a part of "Training tour" and finished successfully.

- Date: 14th February – 18th February 2021 (5days)
- Participant: 13 trainees from DOR
- Program:

Day1	• Pavement condition of Sindhuli Road Project • Introduction of flexible/bitumen pavement

	• Selection of binder • Test of aggregates and binder • Marshall procedure of mix design • Determination of job mix formula • Test of aggregates and binder
Day2	• Interpretation of test results • Determination of theoretical grading • Selection of mix proportion and preparation of different mixes • Marshall procedures and necessary tests of marshall specimens
Day3	• Field visit to batching plant in Bhaktapur and Sindhuli Road upto Mulkot bends
Day4	• Marshall stability, flow test and interpretation of test results • Mix design calculation, determination of job mix formula of mix design and finalization of optimum bitumen content (OBC)
Day5	• Presentation and submission of mix design calculation and discission of results • Group discussion

- Necessary precaution as per COVID-19 protocol was maintained during the whole training program.

- Domestic Technical Tour at Nagdhunga Tunnel Construction Project

Domestic Technical Tour at Nagdhunga Tunnel Construction Project was held on June 2022 as a part of "Training tour" and finished successfully.

- Date: 1st June 2022 (half day)
- Participant: 10 participants from DOR
- Program:

  1. Lecture by the Consultant Team of NTCP
  2. Site Visit to Tunnel Construction Site

1-2 Progress of Activities

(1) Progress of Activities for Output - 1

- Various maintenance works such as routine, recurrent, periodic, specific, and emergency are On-Going.
- 44km of overlay works for Sec. IV has completed as of August 2022. Tender is processing for 8km.
- 10km of overlay works for Sec. III has completed as of August 2022. Tender is processing for 20km with World Bank funds.
- 33km of overlay works of Sec. II has completed as of August 2022. Tender is processing for 3km.
- 8km of overlay works of Sec. I has completed as of August 2022. Tender is processing for remaining 29km.
- Toll collection for the first section (Dhulikhel - Khurkot) is temporarily done with help of DOR instead of contractors which are to be procured by RBN, and the second section (Khurkot - Bardibas) is done by the contractor which was already awarded. Retender of the first section will be proceeded after revising

traffic volume assumption. However, toll collection by the above system is being suspended from March 2020 due to COVID-19.

- Hybrid Electronic Toll Collection (HETC) is going to be replaced to the traditional type of toll collection system and RBN is willing to install HETC as a pilot project in technical support of JICA. Two separate biddings were ordered for the introduction of HETC. One is the construction of toll plaza. Another is the construction of administration office and the development of HETC system, etc.
- RBN had started bidding for installation of HETC system from September 2020, however, bid has expired without decide the contractor.
- At 6th JCC meeting, ED of RBN has requested to JET for necessary support of HETC installation.
- Preliminary survey for installation of ETC has started from June and 2 ETC experts are dispatched to the Project.
- ARMP including the budget for FY 2019/2020, 2020/2021, 2021/2022 was confirmed during the JCC meeting.

(2) Progress of Activities for Output - 2

- Traffic accident record from 2011 to 2021 was collected through traffic police. Result of its analysis will be effectively utilized in plan of traffic safety measures.
- Installation and painting of guardrails (Crash barriers), guard blocks and delineators are in progress. It is recommended that further safety instrument installation should be proceeded taking into consideration the above traffic accident record.
- None of the Road Information Boards of EIS was being updated, and it needs to update and popularize the EIS web site so that users can get update regarding the road situation. JET advised SDDSBR about improvement of operation system and improvement plan is in progress.
- Proposal for Improvement of EIS (with cost estimation and drawings) and proposed contract document for maintenance of EIS (with cost estimation) were submitted to DOR in July 2020. Based on this document, a contractor has been procured and the installation of a new RIB has been completed in Khurkot area in November 2021.
- JET recommends organizing a short (half-day) workshop among the concerned DOR offices. However due to spread of COVID-19, schedule of short workshop has not decided yet.
- Traffic survey along the Sindhuli Road (Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey) were conducted twice, in 2019 and 2022.

(3) Progress of Activities for Output - 3

- Through the series of discussion among DOR, JICA and JET, implementing conditions of the Pilot Projects for restoration of damaged causeways was confirmed, and all concerned party have signed the Minutes of Meeting on 26th September 2019. JET will provide technical assistance in the form of soft component and training component, which is expected to contribute to the sustainability of the project

impact.

- Detailed design for three bridges was prepared by SDDSBR Project Office with support by JET, and it was completed to verify by DOR in the end of November 2020 and then abstract of the cost for three bridges were estimated in the early December 2020. SDDSBR Project office will start preparation for procurement of three packages for Mamti, Bhyakure and Ghyampe bridges.
- Procurement for 3 bridges of Pilot Project was conducted June 2021, and there were more than 10 bids of each bridges. Sindhuli Road Project Office is now conducting evaluation and contract of each bridges will be concluded in August 2021. Construction will be started from September 2021.
- Contractor of 3 pilot project had selected and construction has started since end of September 2021. JET gave instruction of S-Curve to contractor. S-Curve is a monitoring tool of construction progress and it is used as basic data of project progress monitoring.
- Monitoring activities of pilot projects are divided in 3 parts.
  1. Site progress monitoring by using Drone by JET (Once per month)
  2. Joint site survey between DOR-JET-Contractor (Once per month)
  3. Management meeting held by DOR (If necessary, within 1week after joint site survey)
- Environmental study was started from January 2020 for obtain approval of IEE Report by MOPIT before commencement of the construction. However, due to the fact that a new version of EPR 2020 (Environmental Protection Rules by the Ministry of the Environment) regarding the environmental survey process has not been released, and due to the lock down and movement restrictions by COVID-19 started from the end of March 2020, the environmental survey was suspended their activity for the time being. After that, with the release of the new EPR 2020 in September 2020 and the approval of the new template for TOR of Brief Environmental Study (IEE was changed to BES) in early December 2020, a new TOR was submitted at end of December 2020. TOR was finally approved by MOPIT on 14th of June 2021..
- Manual preparation about site investigation, planning and design method for RC continuous slab bridge starts from June 2020 and completed at the end of December 2021. As annex of the manual, typical drawings were submitted on June 2022.
- Training of design manual for RC Continuous Slab Bridge and knowledge sharing workshop is planning on October 2022.
- Domestic Technical Tour at Nagdhunga Tunnel Construction Project was held June 2022 and finished successfully. Detail information for the technical tour is described in 1-1 (4) Training Tour in Nepal.

1-3 Achievement of Output

(1) Achievement of Output - 1

- The work plan was confirmed among the JET and C/Ps.
- Annual allocated budget in ARMP for FY2019/2020 was confirmed in the 2nd JCC Meeting, and the budget for FY 2020/2021 was confirmed at the 4th JCC Meeting on 21st December 2020.

The budget for the FY 2021/2022 was confirmed at the 5th JCC Meeting on 30th July 2021.

- To establish a basic policy for partial widening, JET submitted to DOR a technical report of "Preliminary Survey Report for The Road Improvement Plan" on 18th March 2020.
- RBN started toll collection from 18th September 2019 in separate 2 sections of Dhulikhel - Khurkot and Khurkot - Bardibas in accordance with Nepal gazette published on 15th April 2019.
- Held monthly meeting and joint site patrol regularly.

(2) Achievement of Output - 2

- Traffic accident record from 2011 to 2021 was collected through traffic police.
- 35 number of schools along the Sindhuli Road are selected as a target of safety education.
- Additional EIS location was determined as 2 places in Khurkot, and installation of RIS was completed in November 2022.
- First traffic survey was conducted in June 2019.

No.	Survey items	Contents
1	Traffic Count	・ Roadside count @ 6 locations ・ 24 hrs / 2 weekdays & 1 weekend
2	Origin-Destination	・ Interviewing @ 3 locations ・ 6:00 – 22:00 / 1 weekday
3	Travel Speed	・ Measuring travel time ・ 2 routes (BP Hw. vs. Prithivi Hw.)

- Concept and candidate site of Rest Area were proposed near the Khurkot bus terminal.
- Second traffic survey was conducted in May 2022.

No.	Survey items	Contents
1	Traffic Count	・ Roadside count @ 6 locations ・ 24 hrs / 2 weekdays & 1 weekend
2	Origin-Destination	・ Interviewing @ 3 locations ・ 6:00 – 22:00 / 1 weekday
3	Travel Speed	・ Measuring travel time ・ 2 routes (BP Hw. vs. Prithivi Hw.)

- "Road Safety Improvement Plan" was submitted from JET to DOR in August 2022. This report is the updated management plan of "Road Safety Management Plan" which was submitted to DOR in December 2012.
- Road Safety Awareness Training for School Teachers was conducted and finished successfully in June 2022. It was held in Bhakundebesi (for teachers along Sec. III and Sec IV) and Sindhuli bazar (for teachers along Sec I and Sec II). Education materials and equipment were distributed to participated schoolteachers. 50 teachers from 30 schools, city mayor, traffic police were participated

  Soft copies of seminar materials were distributed to all schools and will be used as road safety awareness campaign in each class.

(3) Achievement of Output - 3

- Target site and structure type was determined as below

No.	Candidate Sites		Selected Type of Bridge
1	STA. 1+400	Ghyampe Bridge	PC Post-tensioned T-girder (cast-in-situ) bridge (40m)
2	STA. 3+900	Mamti Bridge	RC continuous Slab (cast-in-situ) bridge (40m)
3	STA. 9+700	Bhyakure Bridge	PC Post-tensioned T-girder (cast-in-situ) bridge (40m)

- Topographic and geological surveys were conducted
- Detailed design of the three bridges was completed.
- Environmental study was started from January 2020 for obtain approval of BES Report, and TOR was finally approved by MOPIT on 14th of June 2021.
- Procurement of 3 bridges were conducted. There were more than 10 bid of each bridge.
- Constructions of 3 pilot project have started since end of September 2021 and construction period will end September 2023.
- Planning and Design Manual for RC Continuous Slab Bridge(RCSB) ver.1 was submitted on December 2021. Typical drawings were submitted on June 2022

1-4 Achievement of the Project Purpose

- In-progress toward achievement of the project purpose.

1-5 Changes of Risks and Actions for Mitigation

- Sunkoshi Marin Diversion Multipurpose Project

According to the explanation on 2nd JCC meeting about Sunkoshi Marin Diversion Multipurpose Project (SMDMP) which was started by DWRI, it is to be assumed that some part of Sindhuli Road comes under inundation permanently after construction of this project. To maintain the sufficient functions of the Sindhuli Road, proper detour road planning and design is required.

- Road Widening

DOR is planning to widen the width of the road at each section, and request for technical assistance was made to JET. After the consultation with JICA, JET replied to DOR that hasty road widening was not recommended, and DOR should plan it with the priority as follows;

Priority1: Section I (Relatively easier to widen the road than other section, but the part should be limited)

Priority2: Section IV (The Project will provide technical assistance for partial widening for traffic safety)

Priority3: Section II & III (Technically difficult, so it must be thoroughly examined before proceeding)

- Mitigation Measures against COVID-19

In order to mitigate the effect of COVID-19 pandemic, every protocol issued to the public by the Government, such as wearing mask, taking temperature and keeping social distance, shall strictly be followed through the Project's activities.

1-6 Progress of Actions undertaken by JICA

- JICA approved the replacement of Mr. Irino, who was in charge of "Coordination, Procurement and Social Environmental Analysis", and his successor is Ms. Sagawa from Nippon Koei, from the month of April 2020.
- JICA has approved home assignment of Japanese members among JET in response to the travel restriction due to COVID-19 pandemic after the month of April 2020.
- JICA approved to appoint Mr. Rana, who is one of JET, as a "Project Coordinator" in addition to the current position as "Traffic Safety Measures/ Traffic Safety Education", in order to undertake a role of smooth communication under the situation of remote assignment period.
- based on mutual agreement in the 4th JCC Meeting regarding the extension of the project period, Record of Discussions (R/D) was amended at 18th February 2021.
- 8th JCC meeting is added regarding the extension of the project period.
- JICA approved the replacement of Mr. Fujisawa, who was in charge of "Road Structure Planner", and his successor is Mr. Hayakawa from Nippon Koei, from the month of October 2021.
- JICA approved 2 additional ETC experts on May 2022 according to the strong request of ETC installation from ED of RBN.

1-7 Progress of Actions undertaken by Gov. of Nepal

- There was a replacement of the engineers from SDDSBRP (Suryabinayak-Dhulikhel, Dhulikhel-Sindhuli-Bardibas Road Project), DOR. Currently three number of engineers was appointed.
- Construction of the three (3) bridges shall be executed in accordance with the implementation plan approved by the 4th JCC Meeting.

1-8 Progress of Environmental and Social Considerations (if applicable)

- As described in (3) Progress of Activities for Output - 3.

1-9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

- None

1-10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

- The revision of the JET assignment schedule was proposed and accepted as of Oct. 2020. The schedule of sub-activities will be revised accordingly.

- The Project have been collaborating with below ongoing JICA PPP projects / Survey;
  - Feasibility Survey for Traffic Safety Measures using Luminescence Gage Guidance Technology in Nepal
  - Collaboration Program with the Private Sector for Disseminating Japanese Technology for Environmentally friendly Slope Restoration by using Soil Algae through Biological Soil Crust (BSC) in Nepal
- As per the letter from DCID to JET with the ref. no DCID 10/2078-79/181 dated October 4th, 2021, expected construction periods of 3 pilot project exceed the service period of JICA Expert Team. On October 5th, 2021, JET sent a letter to DOR reminding them that JET's service period was determined based on the construction completion date of the Mamti Bridge at the time of the previous decision regarding the JET's service period extension

2　Delay of Work Schedule and/or Problems (if any)

2-1 Detail

- Due to COVID-19 pandemic, the 3rd JCC meeting scheduled on 25th March 2020 was canceled and the JICA experts hurriedly returned to Japan on 22nd March in accordance with the instruction from the headquarters of JICA on 18th March. After that, JET is continuing to be involved only by remote communication with the Nepalese side.

2-2 Cause

- The globally spreading COVID-19 is seriously affecting any economic activity.

2-3 Action to be taken

- In the 4th JCC Meeting, both parties agreed to extend the period of SROM2 with the conditions written in the Minutes of Meeting of the 4th JCC Meeting.
- In order to mitigate the effect of COVID-19 pandemic, every protocol issued to the public by GoN, such as wearing mask, taking temperature and keeping social distance, shall strictly be followed accordingly through the Project's activities.

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Nepal, etc.)

- With regard to the implementation of the pilot project conducted with DOR funds, the roles of JICA, DOR, DWRI and JET were clarified and confirmed in the Minutes of Meeting. DOR is required to make efforts to develop maintenance and management capacity under their own initiative in cooperation with JICA and JICA Expert Team by utilizing this opportunity.
- After obtaining an internal approval in DOR and JICA regarding the extension of the project period, Record of Discussions (R/D) should be amended.
- Record of Discussions (R/D) was amended in February 2021.
- JET hires environmental engineers for the IEE approval process.

3　Modification of the Project Implementation Plan

3-1 PDM/PO

- If the expansion of COVID-19 affects the progress of the project seriously, the PO modification may be necessary.
- One of "Objectively Verifiable Indicators" of the project overall goal that had been not yet determined is established with mutual confirmation as "Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023".
- Based on the discussion in the 4th JCC meeting, duration of the project has changed from 3 years to 4 years due to COVID-19 pandemic.
- Regarding the decision of extension of project period, 8th JCC meeting is added.
- Based on the amendment of the R/D which is effective as of February 2021, Objectively Verifiable Indicators of Output 3 should be amended as follows.

  The Indicator of Original PDM:

  3-1. The Pilot Project for restoration of the damaged causeway is undertaken and completed in cooperation with DOR and DWRI.

  shall be amended as follows

  3-1. The Pilot Project for restoration of the damaged causeway is undertaken during the Project period in cooperation with DOR and DWRI.

3-2 Other modifications on detailed implementation plan

- As DOR agreed to construct three (3) bridges, namely Mamti, Bhyakure and Ghyampe, as Pilot Project at the cost of DOR as per the Minutes of Meeting on August 28, 2019. DOR will implement three (3) bridges, however, due to the budget constrain caused by COVID-19, DOR decided to implement the procurement of contractor including the mobilization for three (3) bridges based on the available budget for FY2020/21. Actual construction will start at the end of rainy season in 2021 after securing the budget of FY2021/22. Construction of the three (3) bridges shall be executed in accordance with the implementation plan approved by the 4th JCC Meeting.

4　Preparation of Gov. of Nepal toward after completion of the Project

- -

II. Project Monitoring Sheet I & II　*as Attached*

III. Reference Documents

1. Traffic Safety Improvement Plan for Sindhuli Road
2. Road Safety Awareness for School teachers
3. Domestic Technical Tour at NTCP

Ver. 8

Project Monioring Sheet I

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal
Implementing Agency: Department of Roads (DOR), Department of Water Resources and Irrigation (DWRI) and Roads Board Nepal (RBN)
Target Group: Staff members of DOR, DWRI and RBN
Period of Project: Apr 2019 - Mar 2023 (48 months)
Project Site: Sindhuli Road

Version_8
Dated February 7, 2023

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
The safe and smooth road traffic along the Sindhuli Road is maintained.	1. Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023.	1. Traffic accident report by the Sindhuli Road Maintenance Unit (SRMU)/Traffic data by the SRMU	The policy and direction on the road operation and maintenance are not drastically changed by the Government of Nepal (GON).	Set a target indicator that was not yet determined (Ver.2) Traffic accident ratio will be reduced to 59% compared to 2015.	COVID-19 pandemic after March 2020 influenced traffic volume, construction procurement and work performance. The above matter caused large impact on the verification of Overall Goal.
	2. Road users' satisfaction to road maintenance and safety management and performance in all sections reaches 4.0 points in average.	2. Interview result of road users based on the traffic survey by the SRMU		Road users' satisfaction was surveyed in 2019 and 2022 and the value was 3.53 on average.	
	3. DOR operates and manages the road maintenance system and the traffic safety system for the Sindhuli Road effectively in cooperation with DWRI and RBN.	3-1. An execution rate of road maintenance budget allocated by RBN and DOR for Sindhuli Road		Financial progress of FY2019/2020, 2020/2021, 2021/2022 and 2022/2023 were reported.	
		3-2. Road inventory, disaster and maintenance records		JET proposed the digitalized road management method to be developed in future	
		3-3. Operation and maintenance records of EIS		JET proposed CPs to centerlize the system and designate an organization responsible for management.	
		3-4. Records of road safety countermeasures in the Road Safety Management Plan		Existing Road Safety Management Plan was reviewed and updated.	
	4. DOR continues to take countermeasures against natural disasters along the Sindhuli Road in cooperation with DWRI.	4. Records of road disasters and road maintenance		Some countermeasures against natural disasters has taken by DWRI and DOR.	
Project Purpose					
The overall operation and maintenance system of the Sindhuli Road is strengthened.	1. A road closure caused by disasters does not continue for more than one day unless unexpected situation happens.	1. Road maintenance record and hazard record	1. Road safety awareness campaign is conducted by various agencies such as Department of Transport Management, Traffic Police, media and other related agencies.	Road closure finished within 11 hours for all cases which has its duration time. However, more than half road closure does not have its duration.	
	2. Surface distress index (SDI) on Sindhuli road keeps in less 2 point (in good condition) through a whole year.	2. SDI record, Disaster record, Road maintenance record, Annual Work Plan		JET collected SDI data from 2019-2022. Except 2020/2021, SDI has been below 2.0 which is good condition.	
	3. A cooperative framework and the division of the responsibilities between DOR and DWRI at the Ministry level are institutionalized.	3. Agreement between DOR and DWRI at the Ministry level	2. The budget and personnel necessary for the road operation and maintenance are to be allocated continuously.	Budget and personnel for road operation and maintenance are allocated sufficiently by DOR and DWRI.	
Outputs					
1. Capacity to operate and maintain the Sindhuli Road is improved.	1-1. Routine, recurrent and periodic maintenance are conducted properly in accordance with the Annual Road Maintenance Plan (ARMP).	1-1-1. Maintenance budget allocated from RBN and DOR 1-1-2. An execution rate of the maintenance budget 1-1-3. Record of road maintenance work		Maintenance budget and exexution rate were reported on JCC meeting. Allocated maintenance budget used properly in accordance with ARMP.	
	1-2. Specific and emergency maintenance for disaster including emergency response is conducted timely and properly.	1-2. Operation record of maintenance machineries including emergency equipment supplied by JICA		Roadside protection work and traffic safety work were conducted at 35 locations during the project period. Emergency facilities has mobilized timely and road closure did not continue more than 11 hours.	
	1-3. Toll collection system is introduced in the Sindhuli Road in cooperation with DOR and RBN.	1-3. Toll collection system plan in the Sindhuli Road		Toll collection was started from Sep. 2019. Preliminary survey was carried out and report was submitted in Jan 2023.	
2. Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.	2-1. Emergency Information System (EIS) is operated and managed properly in sustainable manner.	2-1. Operation and maintenance record of EIS		To realize proper and timely maintenance for smooth operation, DOR head office intervention is required.	
	2-2. Road safety management is undertaken in accordance with the Road Safety Management Plan.	2-2. Road Safety Management Plan		Road safety management is undertaken in accordance with the Road Safety Management Plan. The plan was updated as "Road Safety Improvement Plan " according to current traffic condition.	
	2-3. Awareness and education activities of traffic safety are undertaken by using the developed education materials.	2-3. Education materials of road safety and record of awareness and education activities		Training for school teachers were conducted June 2022. Equipment / materials were distributed to teachers. Traffic Safety Workshop was conducted successfully.	
3. Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.	3-1. The Pilot Project for restoration of the damaged causeway is undertaken during the Project period in cooperation with DOR and DWRI.	3-1. Implementation schedule of the pilot project		Construction of 3 pilot projects has started since end of September 2021. Procurement was conducted for 3 Bridges of Pilot PJT. There was more than 10 bid of each bridges. Progress of the Mamti Bridge is around 50% in construction, while other two bridges don't show remarkable progress except detour work, river protection work and earth work.	
	3-2. The Project related issues including causeway disaster countermeasures are presented by individual counterpart at the workshops and the Joint Coordinating Committee (JCC) meetings.	3-2. Results of seminars and workshops, a manual and training reports		Technical Training on Asphalt Concrete Mix Design and Quality Control in Pavement Construction was held on Feb. 2021. Domestic Technical Tour was conducted in June 2022. Workshop for pilot project will be conducted in October 2022. Manual about the planning, investigation and design method of the causeway rehabilitation was completed and submitted June 2022. At design stage of pilot project, river treatment was presented by DWRI at JCC meeting. Detour road management during construction period was presented by DOR engineers at pilot project workshop.	

Activities	Inputs		Important Assumption
	The Japanese Side	**The Nepalese Side**	
1-1. Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN 1-2. Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2 1-3. Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project 1-4. Update the hazard map and road inventories of the Sindhuli Road 1-5. Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP 1-6. Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening 1-7. Conduct countermeasure works against water induced disasters beyond the right of way by DWRI 1-8. Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN 1-9. Convene regular meetings and monitoring for road operation and maintenance	1. Japanese experts - Chief advisor/Road administration - Deputy Chief Advisor/RoadO/M Planner - Road Structure Planner - Traffic safety Measure/Traffic Safety Education - Pavement Quality Control - Hydrologic Analysis/Flood Control - Road Structural Design - Road Disaster Prevention/EIS - Toll Road System/Pre-F/S of Rest Rrea - Coordination/Procurement/Social Evirmental Analysis 2. Pilot project for restoration of causeway disaster 3. Training in Japan or/and the third countries 4. In country training (technical study tour) 5. Local expenses for the Project activities	1. Counterpart Personnel (C/P) 【DOR】 - Project Director - Project Manager - Engineer - Sub-Engineer 【DWRI】 - Senior Divisional Hydrogeologist - River Disaster Expert (Civil Engineer) 【RBN】 - Senior Engineer 2. Expenses for the related Project activities and others specified in Basic Principles for Technical Cooperation 【DOR】 -Expense for operation and maintenance, and other safety measures of the Sindhuli Road 【DWRI】 -Expense for water induced disaster management works beyond the right of way 【RBN】 -Expense for introduction of the toll collection system 3. Provision of 4-WD vehicle for the site visit 4. Others	
2-1. Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents 2-2. Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan 2-3. Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users 2-4. Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local authorities 2-5. Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.) 2-6. Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities 2-7. Conduct a sharing workshop on road traffic safety 2-8. Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road			**Pre-Conditions** Most of the counterparts who were trained by the Phase 1 keep being deployed as counterparts of the Phase 2.
3-1. Conduct the site survey of the Sindhuli road and select the sites for pilot project 3-2. Conduct the natural condition surveys including EIA, topo. and geological investigations 3-3. Prepare the design, cost estimation and tender documents for the pilot project 3-4. Implementation of the pilot project in collaboration with DWRI 3-5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project 3-6. Prepare the manual about the planning, investigation and design method of the causeway rehabilitation 3-7. Conduct a sharing workshops on pilot project 3-8. Conduct a technical study tour in Nepal			**<Issues and countermeasures>**

Project Monitoring Sheet II

Project Title: The Project for Operation and Maintenance of the Sindhuli Road Phase 2 in Nepal

Version_8　　Dated February 7. 2023

Inputs	Year	1st Year: 2019/2020	2nd Year: 2020/2021	3rd Year: 2021/2022	4th Year: 2022/2023	Remarks	Monitoring: Issue	Monitoring: Solution
		I II III IV	I II III IV	I II III IV	I II III IV			
Expert								
1. Chief Advisor/Road Administration	Plan					I: Home assignment in Japan	Due to COVID-19 impact,from April 2019 to November 2021, assignment of Japanese Experts was suspended.	MM was shifted after April 2021 or partially consume by home assignment (in Japan)
	Actual							
2. Deputy Chief Advisor/ Road O/M Planner 1	Plan							
	Actual					Mr. Hayakawa replaced Mr.Fujisawa in Oct. 2021		
3. Road Structure Planner	Plan							
	Actual							
4. Traffic Safety Measures/ Traffic Safety Education	Plan							
	Actual							
5. Pavement Quality Control	Plan							
	Actual							
6. Hydrologic Analysis/ Flood Control	Plan							
	Actual							
7. Road Structural Design (Causeway)	Plan							
	Actual							
8. Road Disaster Prevention/ EIS	Plan							
	Actual							
9. Toll Road System/ Pre-F/S of Rest Area	Plan							
	Actual							
10. ETC 1	Plan							
	Actual					ETC 1 and ETC 2 positions were added according to the strong request of ETC installation from ED of RBN.		
11. ETC 2	Plan							
	Actual							
12. Coordination/ Procurement/ Social Environmental Analysis	Plan							
	Actual							
13. Road O/M Planner 2	Plan							
	Actual							
Total	Plan							
	Actual							
Equipment								
Projector	Plan							
	Actual				✓			
Video Camera	Plan							
	Actual				✓			
Desktop Comupter + Monitor Set	Plan							
	Actual				✓			
Laptop (HP)	Plan							
	Actual				✓			
Canon Photocopy (IR-ADVC 3520i)	Plan					Equipments are transferred to DOR except one which was no longer available.	-	-
	Actual				✓			
On-line UPS with Battery	Plan							
	Actual				✓			
Voltage Stabilizer	Plan							
	Actual				✓			
UPS for Backup Device	Plan							
	Actual				✓			
Canon Ink Printer G 1020	Plan							
	Actual				✓			
Training in Japan								
November 3 – November 16, 2019. (14 days)	Plan					Completed successfully	-	-
	Actual							
Training Tour								
Technical Training on Asphalt Concrete Mix Design and Quality Control in Pavement Construction / Domestic Technical Tour at NTCP	Plan					Pavement seminar and technical tour at NTCP were finished successfully.	-	-
	Actual							

Activities / Sub-Activities	Year	1st Year I II III IV	2nd Year I II III IV	3rd Year I II III IV	3rd Year I II III IV	Responsible Organization: Japan	Responsible Organization: Nepal	Achievements	Issue & Countermeasures
Output 1: Capacity to operate and maintain the Sindhuli Road is improved.									
1.1 Formulate the implementation plan for the Phase 2 in cooperation with DOR, DWRI and RBN	Plan	✓ ✓ ✓ ✓				JICA Expert	SRMU	Work Plan was confirmed	-
	Actual								
1.2 Prepare the ARMP including the budget in accordance with the implementation plan for the Phase 2	Plan					JICA Expert	SRMU	Annual allocated budget for 2020/2021 was confirmed	Budget consuption progress is to be discussed
	Actual								
1.3 Formulate the mid-term operation and maintenance plan for the Sindhuli Road, which will be implemented after the completion of the Project	Plan	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU, SRDMU, RBN	Draft Plan was jointly prepared by both parties in Jan. 2023	The plan is to be finalized in Feb. 2023
	Actual								
1.4 Update the hazard map and road inventories of the Sindhuli Road	Plan	✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU	JET proposed a digitalized management platform for future implementation	
	Actual								
1.5 Conduct routine, recurrent, periodic, specific, and emergency maintenance works according to the ARMP	Plan	✓ ✓ ✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU	Various maintenance works are On-Going.	
	Actual								
1.6 Conduct improvement works of the Section IV of the Sindhuli Road by a pavement overlay including a partial widening	Plan	✓ ✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU	Overlay work of Sec. IV is now processing. Basic plan of partial widening is established. Heavy overlay damage has confirmed between Dhulikhel - Patalekhet where overlay work was done 2 years ago.	Reconstruction of Dhulikhel - Patalekhet overlay work was proposed. Quality control and implementation plan is to be discussed.
	Actual								
1.7 Conduct countermeasure works against water induced disasters beyond Right of Way by DWRI	Plan	✓ ✓ ✓ ✓ ✓ ✓				JICA Expert	SRDMU	Target site selection is in progress	To be discussed with DWRI
	Actual								
1.8 Prepare and introduce the toll collection system in the Sindhuli Road in cooperation with RBN	Plan	✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU, RBN	Toll system was introduced while contractor procurement is remained	Introduction plan of HETC is to be discussed among related parties.
	Actual								
1.9 Convene regular meetings and monitoring for road operation and maintenance	Plan	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU, SRDMU, RBN	Held monthly meeting and joint site patrol	Utilize online communication
	Actual								
Output 2: Capacity to take measures for road and traffic safety of the Sindhuli Road is enhanced.									
2.1 Update the traffic accident records along the Sindhuli Road and analyze the cause of accidents	Plan	✓ ✓				JICA Expert	SRMU	Collected the accident record from 2011 to 2021	Checking accuracy and analyzing data
	Actual								
2.2 Conduct the road safety measures for road users (e.g., sight distance improvement, intersection improvement, provision of traffic signs, curved mirrors, footpath, bus lay by, etc.) in accordance with the above analysis and the Road Safety Management Plan	Plan	✓ ✓ ✓				JICA Expert	SRMU	Overall improvement planning are in progress. Concrete block installation and painting works are On-Going	Safety instrument installation should be proceeded based on its prioritization.
	Actual								
2.3 Operate and maintain the EIS and provide the additional EIS along the Sindhuli Road for convenience of road users	Plan	✓ ✓ ✓ ✓				JICA Expert	SRMU	Additional RIB was installed at Khurkot	Comprehensive handover plan should be discussed among DOR
	Actual								
2.4 Review the standard of traffic warning and criteria for emergency response using EIS in cooperation with the local administration	Plan	✓ ✓ ✓ ✓				JICA Expert	SRMU	JET proposed a method for updating of warning criteria.	
	Actual								
2.5 Conduct a traffic survey along the Sindhuli Road (e.g., Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey, weight count survey, etc.)	Plan	✓ ✓ ✓ ✓				JICA Expert	SRMU	Traffic Survey was conducted in June 2019. 2nd Traffic Survey was conducted in May 2022.	None
	Actual								
2.6 Prepare the education materials (e.g. leaflets, DVD, etc.) about the traffic safety of the Sindhuli Road and conduct the awareness and education activities (e.g. education/awareness campaign and street drama at schools, radio jingles, billboards along the Sindhuli Road, etc.) in cooperation with the local authorities	Plan	✓ ✓ ✓ ✓				JICA Expert	SRMU	Road Safety Awareness Training for School Teachers was conducted in June 2022. Education equipments and materials were distributed to participated school teachers.	Workshop will be planned in late 2022.
	Actual								
2.7 Conduct a sharing workshop on road traffic safety	Plan	✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU	Conduct at 16 Dec. 2022	
	Actual								
2.8 Conduct a feasibility study on Rest Area as a safety facility of the Sindhuli Road	Plan	✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU	Concept and candidate site was established	
	Actual								
Output 3: Capacity to restore the damaged causeways of the Sindhuli Road is enhanced by the Pilot Project.									
3.1 Conduct the site survey of the Sindhuli road and select the sites for pilot project	Plan	✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU, SRDMU	Target site was confirmed	
	Actual								
3.2 Conduct the natural condition surveys including EIA, topo. and geological investigations	Plan	✓ ✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU, SRDMU	Topographic and geological surveys were conducted	
	Actual								
3.3 Prepare the design, cost estimation and tender documents for the pilot project including tender assistant	Plan	✓ ✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU, SRDMU	Contractors were procured.	
	Actual								
3.4 Implementation of the pilot project in cooperation with DWRI	Plan	✓ ✓ ✓ ✓				JICA Expert	SRMU, SRDMU	Construction of 3 pilot projects has started since end of September 2021. Japanese experts are difficult to monitor progress of pilot project due to COVID-19 restriction. Confirmed that DWRI will conduct river training.	Monthly drone video shooting of the site is using as remote monitoring system for progress report.
	Actual								
3.5 Conduct the on-the-job training on planning, design, construction, supervision, maintenance, etc. for the C/P through the pilot project	Plan	✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU, SRDMU	Regular monitoring system was established	
	Actual								
3.6 Prepare the manual about the planning, investigation and design method of the causeway rehabilitation	Plan	✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU, SRDMU	Manual was completed and submitted on Dec. 2022.	
	Actual								
3.7 Conduct a sharing workshops on pilot project	Plan	✓ ✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU, SRDMU	Training and Whorkshop was held in Oct. 2022	
	Actual								
3.8 Conduct a technical study tour in Nepal	Plan	✓ ✓ ✓ ✓ ✓				JICA Expert	SRMU, SRDMU	Asphalt concrete mix design-seminar was held February 2021 and finished successfully. Domestic Technical Tour at Nagdhunga Tunnel Construction Project was held June 2022 and finished successfully.	
	Actual								

Duration / Phasing		Phase 2-1 (18 months)	Phase 2-2 (18 months)
	Plan		
	Actual		

Monitoring Plan	Year	1st Year: 2019/2020 I II III IV	2nd Year: 2020/2021 I II III IV	3rd Year: 2021/2022 I II III IV	4th Year: 2022/2023 I II III IV	Remarks	Issue	Solution
Monitoring								
Joint Coordinating Committee (JCC) Meeting	Plan	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	The 7th JCC was held in August 2022.	Project is proceeding by remote communication.	JCC is held by using online video meeting.
	Actual	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓			
Set-up the Detailed Plan of Operation	Plan	✓						
	Actual	✓						
Submission of Monitoring Sheet	Plan	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓		To be confirmed by remote communication	MS ver.7 will be submitted in August 2022
	Actual	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓			
Monthly Meeting	Plan	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓		Held only month that mojor experts are staying	
	Actual	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓	✓ ✓	✓ ✓ ✓ ✓ ✓ ✓			
Monitoring Mission from Japan	Plan							
	Actual							
Joint Monitoring	Plan							
	Actual							
Post Monitoring	Plan							
	Actual							
Reports/Documents								
Work Plan of Phase 2	Plan	✓					None	
	Actual	✓						
Project Completion Report	Plan				✓			
	Actual				✓			
Public Relations								
None	Plan							
	Actual							
	Plan							
	Actual							

SRMU: Sindhuli Road Maintenance Unit (under DOR)　SRMU: Sindhuli Road Maintenance Unit (under DOR)

SRDMU: Sindhuli Road Disaster Management Unit (under SRDMU: Sindhuli Road Disaster Management Unit (under DWRI)

TO CR of JICA NEPAL OFFICE

PROJECT MONITORING SHEET Ver.8 (February 2023)

Project Title:
The Project for the Operation and Maintenance of the Sindhuli Road Phase 2
Version of the Sheet: Ver.8

Name: Ram Hari Pokharel
Title: DDG of DCID, DOR
Name: Hiroki Shinkai
Title: Chief Advisor / Road Administration
Submission Date: 7th February 2023

I. Summary

1 Progress

1-1 Progress of Inputs

(1) Experts

As of 16th January, 2023

	Position	Name	Plan MM	Accumulated MM
1	Chief Advisor / Road Administration	Hiroki SHINKAI	19.40	18.77
2	Deputy Chief Advisor/ Road O/M Planner 1	Motoki IWAMARU	18.50	18.35
3	Road Structural Planner	Hiroshi FUJISAWA	13.25	13.22
4	Road Structural Planner	Tomokuni HAYAKAWA	5.05	5.73
5	Traffic Safety Measures/ Traffic Safety Education / Project Coordinator	Bindu Shamsher RANA	11.30	10.95
6	Pavement Quality Control	Izumi MIDORIKAWA	5.90	4.15
7	Hydrologic Analysis/ Flood Control	Khadananda LAMSAL	1.00	1.00
8	Road Structural Design	Ramesh Prasad KOIRALA	7.10	7.05
9	Road Disaster Prevention/ EIS	Akhilesh Kumar KARNA	3.90	3.40
10	Toll Road System/ Pre-F/S of Rest Area	Kiyoshi NARITA	4.20	4.18
11	ETC 1	Noboru KONDO	1.20	1.27
12	ETC 2	Ryohei HAYASHI	1.50	1.27
13	Coordination/ Procurement/ Social Environmental Analysis	Keita IRINO	1.00	1.00
14	Coordination/Procurement	Natsuko SAGAWA	2.80	2.55
15	Road O/M Planner 2	Hikaru TANAKA	1.00	1.00
		Total	97.10	93.88

(2) Equipment

As of 16th January, 2023

	Item	*Quantity*	*Status*
1	Network HDD	1 set	Purchased
2	Projector	1 set	Purchased
3	Camera	1 set	Purchased
4	Multifunction printer	1 set	Purchased
5	Computer	3 set	Purchased
6	Anti-virus software	9 set	Not Purchased
7	Auto CAD LT	3 set	Not Purchased
8	Acrobat	1 set	Not Purchased
9	Uninterruptible power system	3 set	Purchased
10	Inkjet Printer	1 set	Purchased
11	Furniture	1 set	Not Purchased

(3) Training in Japan

- Date: 3rd November – 16th November 2019 (14 days)
- Participant: DOR 6, RBN 2, DWRI 1 (Total 9)
- Program:

  - Toll road system & toll collection system
  - Traffic safety and emergency facilities
  - Road disaster prevention / countermeasure technology
    (incl. frontier technology such as AI and VR)
  - Infrastructure maintenance technology and asset management
  - Pavement technology
  - Contract management of maintenance work
  - Long mountainous tunnel construction technology
  - Preparation of the action plan and presentation

(4) Training Tour in Nepal

1. Asphalt concrete mix design-seminar

Technical training on asphalt concrete mix design and quality control in pavement construction was held on February 2021 as a part of "Training tour" and finished successfully.

- Date: 14th February – 18th February 2021 (5days)
- Participant: 13 trainees from DOR
- Program:

Day1	• Pavement condition of Sindhuli Road Project • Introduction of flexible/bitumen pavement • Selection of binder • Test of aggregates and binder • Marshall procedure of mix design • Determination of job mix formula

	• Test of aggregates and binder
Day2	• Interpretation of test results • Determination of theoretical grading • Selection of mix proportion and preparation of different mixes • Marshall procedures and necessary tests of marshall specimens
Day3	• Field visit to batching plant in Bhaktapur and Sindhuli Road upto Mulkot bends
Day4	• Marshall stability, flow test and interpretation of test results • Mix design calculation, determination of job mix formula of mix design and finalization of optimum bitumen content (OBC)
Day5	• Presentation and submission of mix design calculation and discission of results • Group discussion

- Necessary precaution as per COVID-19 protocol was maintained during the whole training program.

2. Domestic Technical Tour at Nagdhunga Tunnel Construction Project

Domestic Technical Tour at Nagdhunga Tunnel Construction Project was held on June 2022 as a part of "Training tour" and finished successfully.

- Date: 1st June 2022 (half day)
- Participant: 10 participants from DOR
- Program:

  1. Lecture by the Consultant Team of NTCP
  2. Site Visit to Tunnel Construction Site

3. Road Safety Awareness Training for School Teachers (in Nepal)

The Training was held on June 3, 2022 and June 5, 2022 and finished successfully.

- June 3, 2022 and June 5, 2022
- Participants: 50 schoolteachers (from 30 different schools located in Sindhuli Road corridor)
- Major Training Components:

  1. Outline of SROM2 Project
  2. Techers Knowledge and Attitude Test on Road Behavior Through Self-Administered Questionnaire
  3. Road and Road Safety Status of Nepal (Lecture)
  4. Introduction on BP Highway and Road Traffic Crash Problem in BP Highway (Lecture)
  5. Presentation on the Main Causes of Road Accident (Specific to Accident in Sindhuli Road) (Lecture)
  6. Example Lectures of Traffic Safety Awareness to be Practiced at Each School (Lecture)
  7. Presentation of Traffic Signs and Signals (Lecture)
  8. Introduction of Equipment / Material to be Distributed for School Children
  9. Feedback from Teachers

4. Traffic Safety Workshop (in Nepal)

- Period: December 16, 2022
- Participants: 66 persons (from JICA Nepal Office, MoPIT, DOR, RBN, DOTM, World Bank Nepal, Asian Development Bank Nepal, WHO Nepal, Nepal Red Cross Society, IFRC, and Traffic Police Office)
- Major Components:
  1. Outline of Sindhuli Road Project
  2. Outline of The Project for the Operation and Maintenance of the Sindhuli Road Phase 2
  3. Road Safety Status of Nepal
  4. Traffic Volume Trends and Traffic Accident Situation on BP Highway
  5. National and BP Highway Accident Cost
  6. Traffic Safety Management Plan for BP Highway
  7. Knowledge Sharing of Road Safety Awareness Training for School Teachers
  8. Group Work: Group Discussion and Preparation of Presentation
  9. Presentation of Group Work 1: Traffic Accident Analysis with Referring to Accident Record, Vehicle Speed and Road Geometry
  10. Presentation of Group Work 2: Countermeasure Against Traffic Accident on BP Highway
  11. Presentation of Group Work 3: Approaches for Sustainable Safety Awareness Activity
  12. Question and Answer
  13. Feedback (Questionnaire)

5. Training on Planning and Design Manual of Reinforced Concrete Continuous Slab Bridge (RCSB) and Workshop on Pilot Project (Nepal)

- Period: October 12-14, 2022
- Participants: 24 persons (from DOR)
- Major training components is shown as below:
  1. Outline of SROM2 Project
  2. Introduction of Low-cost Bridge - Why RCSB is selected
  3. Bridge Site Selection, Hydrological and Hydraulics Background
  4. Quality Control & Record Keeping
  5. Staging Design
  6. Site Visit to Pilot Bridge (Bhyakure, Mamti and Ghyampe)
  7. Site Visit to Mulkot Bridge, Observation of Sec. III Road
  8. Group Work and Presentation Related to Bid Documents and Procurement Method (Contractors)
  9. Group Work and Presentation Related to Quality Control Method, Management, and Progress Control Method

1-2 Progress of Activities

(1) Progress of Activities for Output - 1

- Various maintenance works such as routine, recurrent, periodic, specific, and emergency are On-Going.
- 44km of overlay works for Sec. IV has completed as of August 2022. Tender is processing for 8km.
- 10km of overlay works for Sec. III has completed as of August 2022. Tender is processing for 20km with World Bank funds.
- 33km of overlay works of Sec. II has completed as of August 2022. Tender is processing for 3km.
- 8km of overlay works of Sec. I has completed as of August 2022. Tender is processing for remaining 29km.
- Toll collection for the first section (Dhulikhel - Khurkot) is temporarily done with help of DOR instead of contractors which are to be procured by RBN, and the second section (Khurkot - Bardibas) is done by the contractor which was already awarded. Retender of the first section will be proceeded after revising traffic volume assumption. However, toll collection by the above system is being suspended from March 2020 due to COVID-19.
- Hybrid Electronic Toll Collection (HETC) is going to be replaced to the traditional type of toll collection system and RBN is willing to install HETC as a pilot project in technical support of JICA. Two separate biddings were ordered for the introduction of HETC. One is the construction of toll plaza. Another is the construction of administration office and the development of HETC system, etc.
- RBN had started bidding for installation of HETC system from September 2020, however, bid has expired without decide the contractor.
- At 6th JCC meeting, ED of RBN has requested to JET for necessary support of HETC installation.
- Preliminary survey for installation of ETC has started from June and 2 additional experts has been dispatched to the Project.
- ARMP including the budget for FY 2019/2020, 2020/2021, 2021/2022 and 2022/2023 were confirmed during the JCC meeting.

(2) Progress of Activities for Output - 2

- Traffic accident record from 2011 to 2021 was collected through traffic police. Result of its analysis will be effectively utilized in plan of traffic safety measures.
- Installation and painting of guardrails (Crash barriers), guard blocks and delineators are in progress. It is recommended that further safety instrument installation should be proceeded taking into consideration the above traffic accident record.
- None of the Road Information Boards of EIS was being updated, and it needs to update and popularize the EIS web site so that users can get update regarding the road situation. JET advised SDDSBR about improvement of operation system and improvement plan is in progress.
- Proposal for Improvement of EIS (with cost estimation and drawings) and proposed contract document for maintenance of EIS (with cost estimation) were submitted to DOR in July 2020. Based on this

document, a contractor has been procured and the installation of a new RIB has been completed in Khurkot area in November 2021.

- JET recommends organizing a short (half-day) workshop among the concerned DOR offices. However due to spread of COVID-19, schedule of short workshop has not decided yet.
- Traffic survey along the Sindhuli Road (Origin Destination Survey, traffic count survey, interview survey for passengers, speed running survey) were conducted twice, in 2019 and 2022.

(3) Progress of Activities for Output - 3

- Through the series of discussion among DOR, JICA and JET, implementing conditions of the Pilot Projects for restoration of damaged causeways was confirmed, and all concerned party have signed the Minutes of Meeting on 26th September 2019. JET will provide technical assistance in the form of soft component and training component, which is expected to contribute to the sustainability of the project impact.
- Detailed design for three bridges was prepared by SDDSBR Project Office with support by JET, and it was completed to verify by DOR in the end of November 2020 and then abstract of the cost for three bridges were estimated in the early December 2020. SDDSBR Project office will start preparation for procurement of three packages for Mamti, Bhyakure and Ghyampe bridges.
- Procurement for 3 bridges of Pilot Project was conducted June 2021, and there were more than 10 bids of each bridge. Sindhuli Road Project Office is now conducting evaluation and contract of each bridge will be concluded in August 2021. Construction will be started from September 2021.
- Contractor of 3 pilot project had selected and construction has started since end of September 2021. JET gave instruction of S-Curve to contractor. S-Curve is a monitoring tool of construction progress, and it is used as basic data of project progress monitoring.
- Monitoring activities of pilot projects are divided in 3 parts.
  1. Site progress monitoring by using Drone by JET (Once per month)
  2. Joint site survey between DOR-JET-Contractor (Once per month)
  3. Management meeting held by DOR (If necessary, within 1week after joint site survey)
- Environmental study was started from January 2020 for obtain approval of IEE Report by MOPIT before commencement of the construction. However, due to the fact that a new version of EPR 2020 (Environmental Protection Rules by the Ministry of the Environment) regarding the environmental survey process has not been released, and due to the lock down and movement restrictions by COVID-19 started from the end of March 2020, the environmental survey was suspended their activity for the time being. After that, with the release of the new EPR 2020 in September 2020 and the approval of the new template for TOR of Brief Environmental Study (IEE was changed to BES) in early December 2020, a new TOR was submitted at end of December 2020. TOR was finally approved by MOPIT on 14th of June 2021..
- Manual preparation about site investigation, planning and design method for RC continuous slab bridge

starts from June 2020 and completed at the end of December 2021. As annex of the manual, typical drawings were submitted on June 2022.

- Domestic Technical Tour at Nagdhunga Tunnel Construction Project was held June 2022 and finished successfully. Detail information for the technical tour is described in 1-1 (4) Training Tour in Nepal.
- Progress of the Mamti Bridge is around 50% in construction, while other two bridges (Ghyampe Bridge and Bhyakure Bridge) don't show remarkable progress except detour work, river protection work and earth work.

1-3 Achievement of Output

(1) Achievement of Output - 1

- The work plan was confirmed among the JET and C/Ps.
- Annual allocated budget in ARMP for FY2019/2020 was confirmed in the 2nd JCC Meeting, and the budget for FY 2020/2021 was confirmed at the 4th JCC Meeting on 21st December 2020.
  The budget for the FY 2021/2022 was confirmed at the 5th JCC Meeting on 30th July 2021.
  The budget for the FY 2022/2023 was confirmed at 8th JCC Meeting on 17th January 2023.
- Allocated maintenance budget used properly in accordance with ARMP (Annual Road Maintenance Plan).
- To establish a basic policy for partial widening, JET submitted to DOR a technical report of "Preliminary Survey Report for The Road Improvement Plan" on 18th March 2020.
- Roadside protection work and traffic safety work were conducted at 35 locations during the project period.
- Emergency facilities has mobilized timely and road closure did not continue more than 11 hours.
- RBN started toll collection from 18th September 2019 in separate 2 sections of Dhulikhel - Khurkot and Khurkot - Bardibas in accordance with Nepal gazette published on 15th April 2019.
- Preliminary study was carried out for introduction of latest ETC system. JET proposed multi ETC system which consists of RFID system and Touch & Go system to be installed in Sindhuli Road. Thus, JET proposed a roadmap for spread and development of ETC, not only in Sindhuli Road but also nationwide including Nagdhunga Tunnel.
- Held monthly meeting and joint site patrol regularly.

(2) Achievement of Output - 2

- Traffic accident record from 2011 to 2021 was collected through traffic police.
- 35 number of schools along the Sindhuli Road are selected as a target of safety education.
- Additional EIS location was determined as 2 places in Khurkot, and installation of RIS was completed in November 2022.
- First traffic survey was conducted in June 2019.

No.	Survey items	Contents
1	Traffic Count	• Roadside count @ 6 locations • 24 hrs / 2 weekdays & 1 weekend
2	Origin-Destination	• Interviewing @ 3 locations • 6:00 – 22:00 / 1 weekday
3	Travel Speed	• Measuring travel time • 2 routes (BP Hw. vs. Prithivi Hw.)

- Concept and candidate site of Rest Area were proposed near the Khurkot bus terminal.
- Second traffic survey was conducted in May 2022.

No.	Survey items	Contents
1	Traffic Count	• Roadside count @ 6 locations • 24 hrs / 2 weekdays & 1 weekend
2	Origin-Destination	• Interviewing @ 3 locations • 6:00 – 22:00 / 1 weekday
3	Travel Speed	• Measuring travel time • 2 routes (BP Hw. vs. Prithivi Hw.)

- "Road Safety Improvement Plan" was submitted from JET to DOR in August 2022. This report is the updated management plan of "Road Safety Management Plan" which was submitted to DOR in December 2012.
- Road Safety Awareness Training for School Teachers was conducted and finished successfully in June 2022. It was held in Bhakundebesi (for teachers along Sec. III and Sec IV) and Sindhuli bazar (for teachers along Sec I and Sec II). Education materials and equipment were distributed to participated schoolteachers. 50 teachers from 30 schools, city mayor, traffic police were participated

  Soft copies of seminar materials were distributed to all schools and will be used as road safety awareness campaign in each class.
- Traffic Safety Workshop was conducted and finished successfully in December 2022. DOR, Traffic police and other donors were participated to the workshop and active discussion took place.
- The existing criteria for the rainfall-based warning system were reviewed and it was found that the warning criteria were developed on the basis of the daily rainfall data obtained from the Department of Hydrology and Meteorology (DHM). From the review of the rainfall-based warning system, it was found that currently, half-value-accumulated rainfall is being used to issue a warning. The threshold was developed from the DHM rainfall stations as enough rainfall data from the EIS were not accumulated when the threshold was proposed. In addition to rainfall along the road, it is necessary to analyze the rainfall from the watershed. Therefore, it is necessary to collect the rainfall data from the DHM rainfall stations and analyze them based on the road closure.
- From the review of existing criteria for the rainfall-based warning system, an algorithm for the revision of the rainfall-based warning criteria was submitted January 2023.

(3) Achievement of Output - 3

- Target site and structure type was determined as below

No.	Candidate Sites		Selected Type of Bridge
1	STA. 1+400	Ghyampe Bridge	PC Post-tensioned T-girder (cast-in-situ) bridge (40m)
2	STA. 3+900	Mamti Bridge	RC continuous Slab (cast-in-situ) bridge (40m)
3	STA. 9+700	Bhyakure Bridge	PC Post-tensioned T-girder (cast-in-situ) bridge (40m)

- Topographic and geological surveys were conducted
- Detailed design of the three bridges was completed.
- At design stage, river treatment for pilot project sites was presented by DWRI at JCC meeting.
- Environmental study was started from January 2020 for obtain approval of BES Report, and TOR was finally approved by MOPIT on 14th of June 2021.
- Procurement of 3 bridges were conducted. There were more than 10 bid of each bridge.
- Constructions of 3 pilot project have started since end of September 2021 and construction period will end September 2023.
- Planning and Design Manual for RC Continuous Slab Bridge (RCSB) which will be utilized in the Sindhuli Road and its feeder roads, was prepared and submitted as the first version on December 2021. Typical drawings were submitted in June 2022. JET received comments from DOR regarding the above said manual in October 2022. After discussion and exchange of opinion with DOR, the revised manual was submitted in December 2022.
- "Training on Design Manual of Reinforced Concrete Slab Bridge (RCSB) and Knowledge Sharing Workshop on Pilot Project" was held on October 12 to 14, 2022, with the participation of 24 engineers from DOR.
- Detour road management during construction period was presented by DOR engineers at pilot project workshop. Detour road functioned well during rainy season.

1-4 Achievement of the Project Purpose

- In-progress toward achievement of the project purpose.
- Indicator-1

  Road closure data since 2019 until 2022 were collected and summarized in the following table.

  13 road closures could confirm its duration and road closure finished within 11 hours for all cases. On the other hand, there is no road closure duration data for 22 cases, and it is necessary to re-consider the data storage method.

  As a result, all road closure duration which we could confirm the data were less than 1day, however, there are more than half data which we could not confirm the road closure duration.

Road Closure Duration	Road Closure Number
Less than 1day	13
More than 1day	0
No closure time written	22
TOTAL	35

- Indicator-2

  Summary of SDI for 2019-2022 is shown in the following table. Except 2020/2021, SDI has been below 2.0, and it means continuous improvement of pavement is necessary.

	2019/2020	2020/2021	2021/2022	2022/2023
Bardibas - Rato River	0.50	1.85	1.92	2.00
Rato River - Chure Temple	0.75	2.00	2.00	2.25
Chure Temple - Sindhuli	1.35	1.86	2.32	2.48
Sindhuli - Khurkot	0.97	2.32	1.61	0.95
Khurkot - Barkhe Khola	0.51	2.13	2.24	2.11
Barkhe Khola - Dhulikhel	2.32	2.85	2.11	2.50
Average of the year	**1.13**	**2.23**	**2.00**	**1.93**

- Indicator-3

  Budget for the road operation and maintenance are allocated by GON and RBN every year, and the amount is increasing. Thus, DWRI conducted disaster countermeasure work along Sindhuli Road.

  Regarding organization structure, Sindhuli Road has sufficient organization and personnel for maintenance works.

1-5 Changes of Risks and Actions for Mitigation

- Sunkoshi Marin Diversion Multipurpose Project

According to the explanation on 2nd JCC meeting about Sunkoshi Marin Diversion Multipurpose Project (SMDMP) which was started by DWRI, it is to be assumed that some part of Sindhuli Road comes under inundation permanently after construction of this project. To maintain the sufficient functions of the Sindhuli Road, proper detour road planning and design is required.

- Road Widening

DOR is planning to widen the width of the road at each section, and request for technical assistance was made to JET. After the consultation with JICA, JET replied to DOR that hasty road widening was not recommended, and DOR should plan it with the priority as follows;

Priority1: Section I (Relatively easier to widen the road than other section, but the part should be limited)

Priority2: Section IV (The Project will provide technical assistance for partial widening for traffic safety)

Priority3: Section II & III (Technically difficult, so it must be thoroughly examined before proceeding)

- Mitigation Measures against COVID-19

In order to mitigate the effect of COVID-19 pandemic, every protocol issued to the public by the Government, such as wearing mask, taking temperature and keeping social distance, shall strictly be followed through the Project's activities.

1-6 Progress of Actions undertaken by JICA

- JICA approved the replacement of Mr. Irino, who was in charge of "Coordination, Procurement and Social Environmental Analysis", and his successor is Ms. Sagawa from Nippon Koei, from the month of April 2020.
- JICA has approved home assignment of Japanese members among JET in response to the travel restriction due to COVID-19 pandemic after the month of April 2020.
- JICA approved to appoint Mr. Rana, who is one of JET, as a "Project Coordinator" in addition to the current position as "Traffic Safety Measures/ Traffic Safety Education", in order to undertake a role of smooth communication under the situation of remote assignment period.
- based on mutual agreement in the 4th JCC Meeting regarding the extension of the project period, Record of Discussions (R/D) was amended at 18th February 2021.
- 8th JCC meeting is added regarding the extension of the project period.
- JICA approved the replacement of Mr. Fujisawa, who was in charge of "Road Structure Planner", and his successor is Mr. Hayakawa from Nippon Koei, from the month of October 2021.
- JICA approved 2 additional ETC experts on May 2022 according to the strong request of ETC installation from ED of RBN.

1-7 Progress of Actions undertaken by Gov. of Nepal

- There was a replacement of the engineers from SDDSBRP (Suryabinayak-Dhulikhel, Dhulikhel-Sindhuli-Bardibas Road Project), DOR. Currently three number of engineers was appointed.
- Construction of the three (3) bridges shall be executed in accordance with the implementation plan approved by the 4th JCC Meeting.

1-8 Progress of Environmental and Social Considerations (if applicable)

- As described in (3) Progress of Activities for Output - 3.

1-9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

- Gender consideration was reviewed in the Pre-F/S of the rest area. In the roadside situation of Sindhuli Road, although restaurants and gas stations have toilets, it is pointed out that there are few quality toilets for women and road users. Considering the current situation, concept of the Rest Area in Sindhuli Road is proposed as follows.

Step 1: To provide parking and toilets for all road users.
Step 2: To provide shops and restaurants considering the middle class and all road users.
The maintenance and management of the facilities will be carried out by DOR, local governments, and private companies.

1-10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

- The revision of the JET assignment schedule was proposed and accepted as of Oct. 2020. The schedule of sub-activities will be revised accordingly.
- The Project have been collaborating with below ongoing JICA PPP projects / Survey;
  - Feasibility Survey for Traffic Safety Measures using Luminescence Gage Guidance Technology in Nepal
  - Collaboration Program with the Private Sector for Disseminating Japanese Technology for Environmentally friendly Slope Restoration by using Soil Algae through Biological Soil Crust (BSC) in Nepal
- As per the letter from DCID to JET with the ref. no DCID 10/2078-79/181 dated October 4th, 2021, expected construction periods of 3 pilot project exceed the service period of JICA Expert Team. On October 5th, 2021, JET sent a letter to DOR reminding them that JET's service period was determined based on the construction completion date of the Mamti Bridge at the time of the previous decision regarding the JET's service period extension

2　Delay of Work Schedule and/or Problems (if any)

2-1 Detail

- Due to COVID-19 pandemic, the 3rd JCC meeting scheduled on 25th March 2020 was canceled and the JICA experts hurriedly returned to Japan on 22nd March in accordance with the instruction from the headquarters of JICA on 18th March. After that, JET is continuing to be involved only by remote communication with the Nepalese side.

2-2 Cause

- The globally spreading COVID-19 is seriously affecting any economic activity.

2-3 Action to be taken

- In the 4th JCC Meeting, both parties agreed to extend the period of SROM2 with the conditions written in the Minutes of Meeting of the 4th JCC Meeting.
- In order to mitigate the effect of COVID-19 pandemic, every protocol issued to the public by GoN, such as wearing mask, taking temperature and keeping social distance, shall strictly be followed accordingly through the Project's activities.

2-4 Roles of Responsible Persons/Organization (JICA, Gov. of Nepal, etc.)

- With regard to the implementation of the pilot project conducted with DOR funds, the roles of JICA, DOR, DWRI and JET were clarified and confirmed in the Minutes of Meeting. DOR is required to make efforts to develop maintenance and management capacity under their own initiative in cooperation with JICA and JICA Expert Team by utilizing this opportunity.
- After obtaining an internal approval in DOR and JICA regarding the extension of the project period, Record of Discussions (R/D) should be amended.
- Record of Discussions (R/D) was amended in February 2021.
- JET hires environmental engineers for the IEE approval process.

3　Modification of the Project Implementation Plan

3-1 PDM/PO

- If the expansion of COVID-19 affects the progress of the project seriously, the PO modification may be necessary.
- One of "Objectively Verifiable Indicators" of the project overall goal that had been not yet determined is established with mutual confirmation as "Traffic accident ratio (number of traffic accident per vehicle-km) for the year of 2015 in all sections reduces by 30 % by 2023".
- Based on the discussion in the 4th JCC meeting, duration of the project has changed from 3 years to 4 years due to COVID-19 pandemic.
- Regarding the decision of extension of project period, 8th JCC meeting is added.
- Based on the amendment of the R/D which is effective as of February 2021, Objectively Verifiable Indicators of Output 3 should be amended as follows.

  The Indicator of Original PDM:

  3-1. The Pilot Project for restoration of the damaged causeway is undertaken and completed in cooperation with DOR and DWRI.

  shall be amended as follows

  3-1. The Pilot Project for restoration of the damaged causeway is undertaken during the Project period in cooperation with DOR and DWRI.

3-2 Other modifications on detailed implementation plan

- As DOR agreed to construct three (3) bridges, namely Mamti, Bhyakure and Ghyampe, as Pilot Project at the cost of DOR as per the Minutes of Meeting on August 28, 2019. DOR will implement three (3) bridges, however, due to the budget constrain caused by COVID-19, DOR decided to implement the procurement of contractor including the mobilization for three (3) bridges based on the available budget for FY2020/21. Actual construction will start at the end of rainy season in 2021 after securing the budget of FY2021/22. Construction of the three (3) bridges shall be executed in accordance with the implementation plan approved by the 4th JCC Meeting.

4 Preparation of Gov. of Nepal toward after completion of the Project

- -

II. Project Monitoring Sheet I & II *as Attached*

III. Reference Documents

1. Traffic Safety Improvement Plan for Sindhuli Road
2. Road Safety Awareness for School teachers
3. Domestic Technical Tour at NTCP
4. Planning and Design Manual for RC Continuous Slab Bridge (RCSB)
5. Preliminary Survey for Introduction of ETC on Sindhuli Road
6. Implementation Report on "Road Safety Workshop"
7. Mid/Long term operation and maintenance plan
8. Report on Modification of Threshold Values for Rainfall Based Warning (Emergency Information System / EIS)