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ROYAL GOVERNMENT OF BHUTAN  
MINISTRY OF WORKS AND HUMAN SETTLEMENT  
THIMPHU: BHUTAN

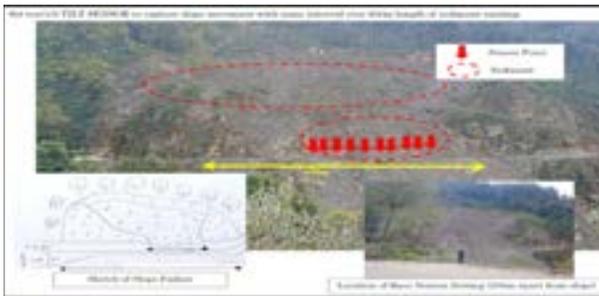
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## **PROJECT FOR CAPACITY DEVELOPMENT ON COUNTERMEASURES OF SLOPE DISASTER ON ROADS IN BHUTAN - Department of Roads**

### **PROJECT DETAILS**

#### **Name of TCP**

Project for Capacity Development on Countermeasures of Slope Disaster on Roads in Bhutan

#### **Funding Agency**

Japan International Cooperation Agency, Japan and Royal Government of Bhutan

#### **Project Beneficiary**

Department of Roads, MoWHS

#### **Project Duration**

Jan 2019 – Dec 2022 (4 years)

#### **Project Location:**

Critical sections along PNH1 (Thimphu-Trashigang) under Lobeyisa and Trongsa RO & PNH4 (Gelephu-Trongsa) under Trongsa RO

### **SYNOPSIS**

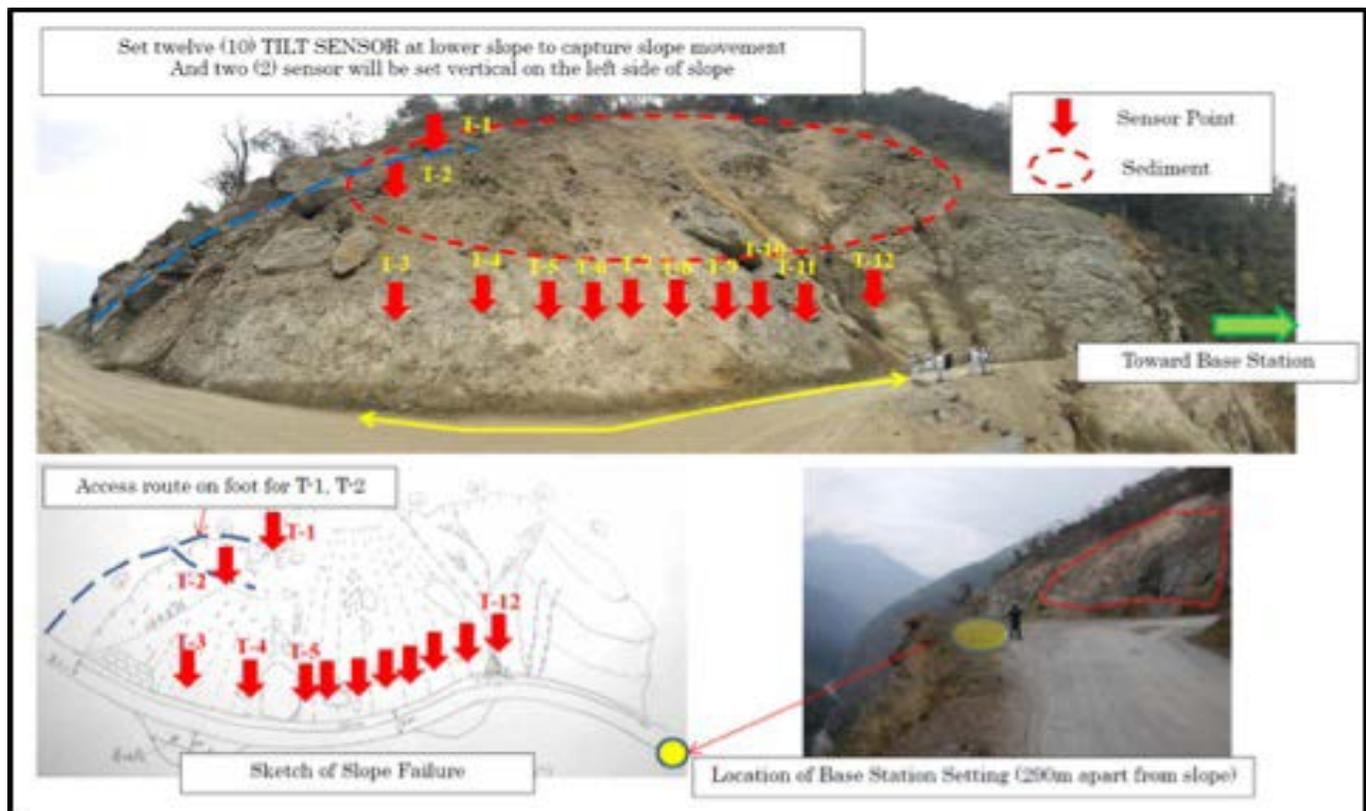
Roads are major means of travel and transportation in the Kingdom of Bhutan and development of an efficient and

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safe road network is essential for Bhutan’s social and economic development. The Framework for National Development “Bhutan 2020,” the Road Sector Master Plan (2007– 2027), the 10th Five Year Plan (2008–2012), and the 11th Five Year Plan (2013–2017) provide the basis for national development in the road sector. Indeed, the total road length in the country was about 2,300 km in 1990 and is increasing every year. Bhutan 2020 set the following numerical targets and strongly promotes road development as a major national project:

- Improve arterial roads by 2007 to allow for traffic of 30-t trucks.
- Develop a road network by 2012 that can be reached on foot in half a day by 75% of the country’s population.
- Complete the second east–west road (about 794 km) by 2017.



Reotala Project Site along Primary National Highway 1

However, because a large part of the country consists of steep mountain areas, there are significant geological and topographic constraints on the construction of the majority of roads. There are few roads with sufficient road slope disaster management in place. Consequently, slope failures, landslide and debris flow frequently occur and isolate areas from the capital or other areas of the country, disrupting travel and the transport of agricultural crops.

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The Department of Roads (DoR), Ministry of Works and Human Settlement, which is responsible for the construction and maintenance of roads and bridges in Bhutan, has covered road slopes with vegetation and reinforced them. However, because of a lack of skills and experience, sufficient road slope disaster countermeasure has still not been implemented.



*Germination Test at the yard of Lobeysa Regional Office*

For now, the current national roads have been widening for the development of road network in Bhutan, which are mainly consists of cutting and/or filling of the slopes on roads. However, slope failures and landslides often happens under and after construction since the standards of construction and knowledge of geology and topography are not sufficient for safe cutting and filling on mountainous areas. Some failure would be a trigger for serious disaster like human loss and road collapse. Additionally, the information on roads such as slope disasters and road closures are not provided with sufficient quantities to road users due to lack of management of the information.



*Implementation of suitable countermeasure works for rock slope failure (Rockfall)*

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The overall objective of the Project are as follows;

- To improve the capacity of DoR for countermeasures of slope disaster on Road
- Planning and implementation of countermeasures on selected slopes

**PROJECT OUTPUT UNDER TCP:**

<b>Output</b>	<b>Description</b>	<b>Funding Agency</b>
Output 1	Conditions of ex-ante traffic control are clarified	JICA, Japan
Output 2	Suitable bio-engineering works are selected against debris slope failure	JICA, Japan
Output 3	Standards for cut slope angles for debris slope failure and rock slope failure are revised	RGoB
Output 4	Suitable countermeasure works are implemented for rock slope failure	RGOB
Output 5	Suitable drainage works and facilities are installed for debris flow	RGoB
Output 6	Information system on slope disasters and traffic controls on roads is improved	JICA, Japan

\*Budget secured for output 3, 4 and 5 for 2019-2020FY = Nu. 15,000,000.00

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***Transfer Guidelines 2019 - Human Resource Division***

The Ministry of Works and Human Settlement in line with clause 14.4 of the BCSR 2018, developed a Transfer Guidelines which has been duly endorsed by the Royal Civil Service Commission.

The transfer of personnel that are parented by the Ministry of Works and Human Settlement shall be carried out in line with the provisions of the Transfer Guidelines and all the relevant working agencies have been requested to comply Guidelines.

Transfer Guidelines can be downloaded from the Ministry's website

<https://www.mowhs.gov.bt/wp-content/uploads/2019/11/Transfer-Guidelines-1.pdf>

## ***Induction Program for New Recruits - Human Resource Division***

In Feb. 2020, Induction Program for the new recruits joining the technical services in the Ministry of Works and Human Settlement, Dzongkhags and Thromdes was organized by the HRD. 35 new recruits have joined the various agencies as Engineers, Urban Planners, Development Regulatory Officers, Architect, GIS Officers.

A week long Induction Program provided opportunity to the departments and divisions of the Ministry of Works and Human Settlement to briefly introduce the ministry, its mandates and objectives.

## ***Dilemma of Traffic Congestion in Thimphu - Policy and Planning Division***

There is a direct correlation between the increase in vehicle numbers to the traffic congestion. However, it wouldn't be wise to blame vehicular increase alone for the traffic congestion. We often tend not to see the other side of the story if increase in vehicles is the sole cause of traffic congestion in Thimphu.

Thimphu thromde has approximately 90 number of zebra-crossing within the core area and the express highway in its 26 Sq. Km stretch. The main stakeholders for deciding on the requirement of zebra crossing in the city are Thimphu Thromde, Road Safety and Transport Authority, Traffic Division under Royal Bhutan police and the concerned agencies in the proposed locations.

Thimphu thromde in consultation with its relevant stakeholders has also punctured along the expressway and other roads to ease the traffic congestion. Though it has helped in easing traffic congestion to certain extent but at present it is just one of the few short-term measures taken by thromde which may not be advisable in the long run. Thus, three issues have been identified at present to address the traffic congestion.



*The 6.1 Km expressway has 11 numbers of zebra- crossing*

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### ***Whose Right-of-way is Zebra-Crossing?***

One of the main issues on the zebra-crossing is the right-of-way. Zebra-crossing is not only meant for the pedestrians but also to the motorists. Zebra-crossing is often seen as a pedestrian's right-of-way in Bhutan. The Road Safety and Transport Act 1999 indicates the general duty of motorists and that the motorist should follow sets of rules and regulations to avoid accidents. However, the act does not mention pedestrian's duty to obey traffic rules and regulations. Such scenario has made pedestrians more resilient not to obey or follow traffic rules and regulations. It should also be taken into consideration that many pedestrians tend not to use zebra-crossing and haphazardly crossing the road as and when they feel to cross it. Thus, these has sometimes led unavoidable circumstances leading to congestion.



*Zebra- crossing is often considered as a pedestrians Right of Way often causing traffic congestion during peak hours*

### ***Underutilization of Underpasses***

The two underpasses along the Deboum Lam was constructed in 2009 for the pedestrians. However, since its construction it had remained unused owing to lack of basic facilities and safety concerns. The Thromde in the past has also mentioned about space constraints for not being able to come up with underpasses for the smooth flow of the traffic.



*Underpass along the Deboum Lam. Thimphu Thromde is currently planning to construct one along the expressway*

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*Underpass along the Debowm Lam received a major facelift in 2017. The underpass is now fitted with lights and CCTV cameras. The underpass will remain open from 7:30 am till 9 pm.*

**Local Public Transport**

Thimphu has more than one hundred thousand population living in the city. To meet the transport demand for this population, the city has government and privately-run city bus services. However, the lack of adequate number of buses have resulted in buses running to its full capacity during the peak hours and almost running empty during other times. It should also be noted that the bus services are provided between half an hour to two hours. This has resulted in assymetry of information between the commuters and the service provider. Such situation has resulted in longer waiting time for the public resulting in publics desiring to go for private vehicles irrespective of the cost. Thus, the inadequate number of buses compounded by irregular bus timing may have snowballed to increase in vehicle in the capital city.



*City Bus timing for different location in Thimphu*

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However, there is still time for us to have proper intervention to address the traffic congestion situation in capital city.

### ***Introduction of Traffic Signals***

At present Thimphu is the only capital city in the world that does not have traffic light. Many zebra-crossings in the capital city are being monitored by the traffic personnel. It has however become important to introduce traffic lights along the expressway to ease the traffic congestion. This would allow the pedestrians and motorists to cross the expressway as per the traffic signals and not as and when the pedestrians wanted to. Thus, reducing the traffic congestion.

### ***Enhancing the Efficiency of Local Public Transport***

The local public transport should enhance its efficiency in providing transportation to its commuters. Rather than providing the services on a half hourly basis, the local public transport should provide services to the commuters every fifteen minutes during peak hours. During the off-peak hours, the services can be provided on a half hourly basis.

### ***App for Bus Services***

The City Bus Services should come up with app-based information for the services it provides to its commuters. This would allow the commuters to plan their journey accordingly based on their location. Such initiative would also reduce their waiting or transaction time.

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