

**GOVERNMENT OF INDIA
MINISTRY OF ROAD TRANSPORT AND HIGHWAYS**

**LOK SABHA
UNSTARRED QUESTION NO. 3226
ANSWERED ON 12TH March, 2026**

CLIMATE RESILIENT DESIGN FOR ROADS AND BRIDGES

3226. SHRI JASHUBHAI BHILUBHAI RATHVA:

Will the Minister of ROAD TRANSPORT AND HIGHWAYS

सड़क परिवहन और राजमार्ग मंत्री

be pleased to state:

(a) whether special engineering standards and climate resilient design features are being adopted for construction of roads and bridges in snow bound, landslide prone and flood affected areas;

(b) if so, the details of standards and technologies adopted;

(c) whether these measures have reduced seasonal disruptions to road connectivity; and

(d) the details of findings of any assessments conducted in this regard?

ANSWER

THE MINISTER OF ROAD TRANSPORT AND HIGHWAYS

(SHRI NITIN JAIRAM GADKARI)

(a) to (b) National Highways (NHs) Projects including those sections of NHs passing through snowy, landslide-prone and flood-affected areas are planned, designed and constructed in accordance with the provisions of Indian Roads Congress (IRC) codes and specifications. IRC has published several

guidelines/standards/techniques such as 'IRC:52 Guidelines for the Alignment Survey and Geometric Design of Hill Roads', 'IRC:75(Part-2) Guidelines for Retrofitting Measures for Protection of Road Systems Including Surrounding Areas from Rainfall, Waterlogging and Flooding', 'IRC:138 Guidelines for Highway Engineers on Disaster Resilient Green Highways in Multi-Hazard Ecosystem', 'IRC:SP:48 Hill Road Manual', 'IRC:SP:106 Engineering Guidelines on Landslide Mitigation Measures', ' IRC:SP:113 Guidelines on Flood Disaster Mitigation for Highway Engineers' etc.

(c) to (d) IRC guidelines are developed on the basis of global successful best practices adjusted to local climatic & load conditions and outcome of indigenous research. These guidelines have the provisions of selection of alignment/improvement option on the basis of landslide susceptibility map, design criteria such as highest flood level, rainfall intensity, seismic zone, exposure condition like corrosion resistant reinforcement, road building materials of bitumen duly considering prevailing maximum & minimum pavement temperature/frost resistant materials, landslide protection measures including avalanche protection, etc. NHs planned, designed and constructed duly considering project specific climatic factors/design parameters/materials which results into climate resilient infrastructure resisting seasonal disruptions to road connectivity.
