

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

**LOK SABHA
UNSTARRED QUESTION NO. 2140
ANSWERED ON 12TH FEBRUARY, 2026**

GUIDELINES FOR GEOMETRIC DESIGN IN HILLY TERRAINS

2140. SHRI ANURAG SINGH THAKUR:

Will the Minister of ROAD TRANSPORT AND HIGHWAYS

सड़क परिवहन और राजमार्ग मंत्री

be pleased to state:

(a) the salient features and implementation status of IRC:52-2019 guidelines regarding geometric design in hilly terrains, detailing critical provisions for hairpin bends including 15–30 meter curve radii, ruling gradients up to 7% and superelevation to ensure safe traffic reversal;

(b) the specific NHAI construction rules enforced for hairpin bends in Himachal Pradesh, incorporating erosion control measures under IRC: SP:48-2023, avoidance of 90-degree hill cuttings per recent policy circulars and integration with Green National Highways Corridor Project standards to preserve mountainous ecosystems;

(c) the decisions regarding speed limits on National Highways in hilly areas, specifying ruling design speeds of 40-60 km/h in steep terrains and variations for public transport safety under Ministry SOPs; and

(d) whether the Government proposes to update these rules to enhance sustainability and accident reduction in States like Himachal Pradesh and if so, the details thereof?

ANSWER

THE MINISTER OF ROAD TRANSPORT AND HIGHWAYS

(SHRI NITIN JAIRAM GADKARI)

(a) to (d) National Highways (NHs) projects are executed in accordance with the provisions of the applicable Contract/Concession Agreement, which are formulated in conformity with Indian Roads Congress (IRC) Manuals/Guidelines. Primarily the applicable IRC guidelines for NHs projects in hilly terrains are IRC:52 “Guidelines for the Alignment Survey and Geometric Design of Hill Roads” and IRC: SP:48 “Hill Road Manual”. Geometric design parameters such as design speed, horizontal curve radii, super-elevation, hairpin bends, vertical gradient etc. are provided in conformity with the provisions of IRC:52; whereas other parameters such as hill cuttings, erosion control measures including bio-engineering measures, safety & traffic control measures, ecology & environment etc. are in conformity with the provisions of IRC: SP:48 which ensure safe traffic reversal, enhance sustainability, reduce accident, public transport safety and preserve mountainous ecosystem. Government in Ministry of Road Transport & Highways has also issued a circular on 07th November 2025 for systematic remedial measures to address concerns regarding Construction of National Highways in Hilly Regions.
