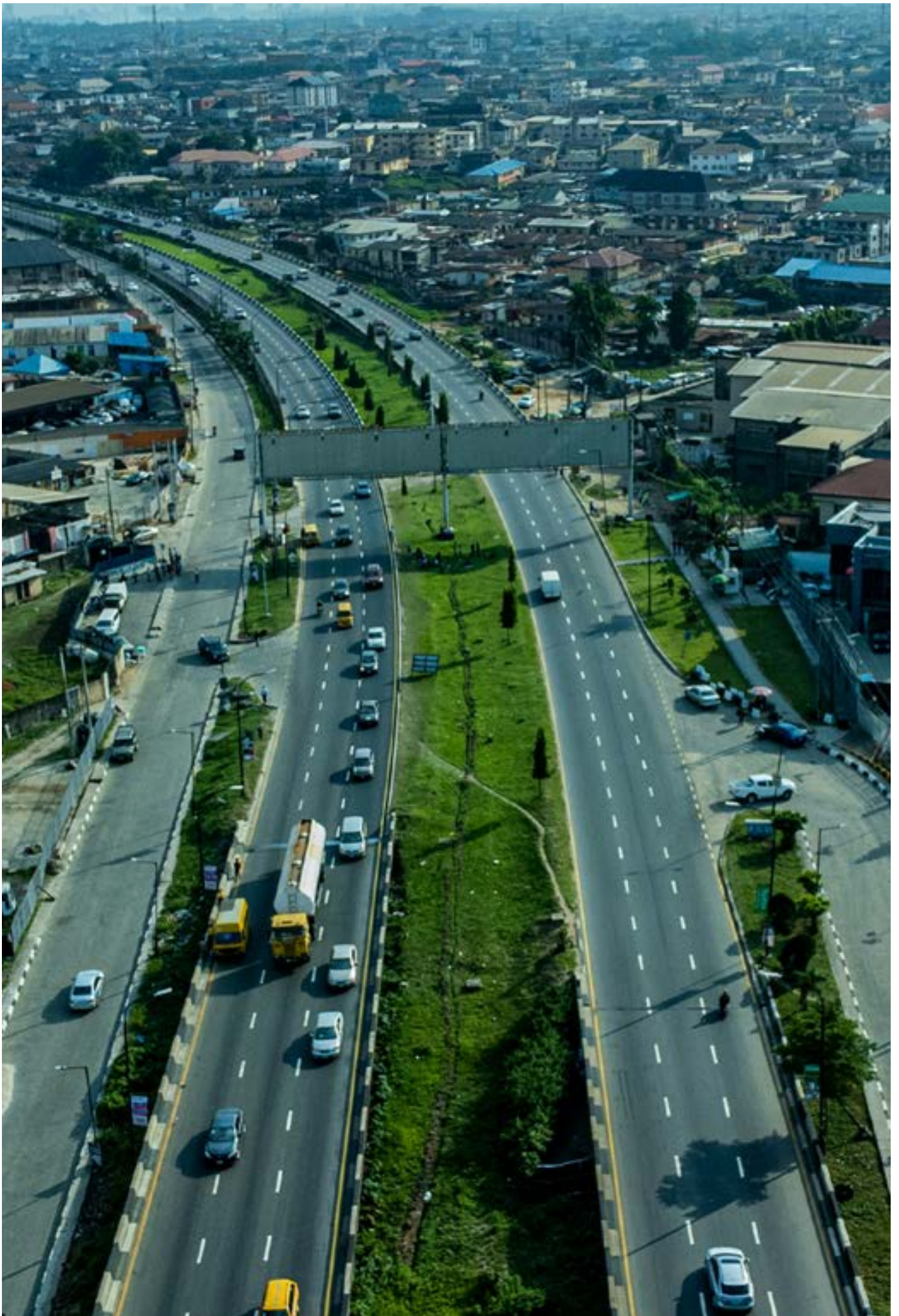


Howden Risk Engineering

Property Newsletter January'26

HOWDEN



Introduction

Over the past few years, India has witnessed a substantial surge in highway construction, markedly expanding network length and accelerating building pace. However, this growth coincides with persistent road safety challenges such as high fatality rates, rising accident numbers (despite reduced severity in 2022), and increasing insurance claims highlighting a critical disconnect between infrastructure development and effective safety measures. Contributing factors include poor road design, inadequate enforcement, and insufficient pedestrian facilities, which continue to fuel the crisis.

In this version, we have tried to cover various claims encountered in road projects across India as well as the best practices followed across the industry to minimize losses within the infrastructure sector.

Road- Prevention and Mitigation

1. Claims observed on road projects

Under Construction Phase (CAR policy)

Major Losses Peril	Minor Losses
• AOG-Flood, Landslide, Earthquake etc. • Structure failure, due to Design defect/ Poor workmanship	i. Theft ii. Rain cuts iii. Burglary iv. Accidents v. Material Washout

Under Operational Phase (Fire/ IAR policy)

- Roads washout
- Slope protection damage due to landslide
- Soil erosion due to environmental Impact./due to natural springs not being mapped properly during construction, leading to subsidence
- Pothole, due to irregular maintenance.
- Due to overload beyond designed limit.
- Wear & tear.
- Retaining wall and breast wall damage
- Losses due to excess water absorption in grit over the standard prescribed limits
- Lightning strike leading to failure of electronic equipment
- Melting of roads due to higher surface temperatures

2. In India, various types of roads are constructed, but the two most commonly used are **Flexible Pavement** and **Rigid Pavement**

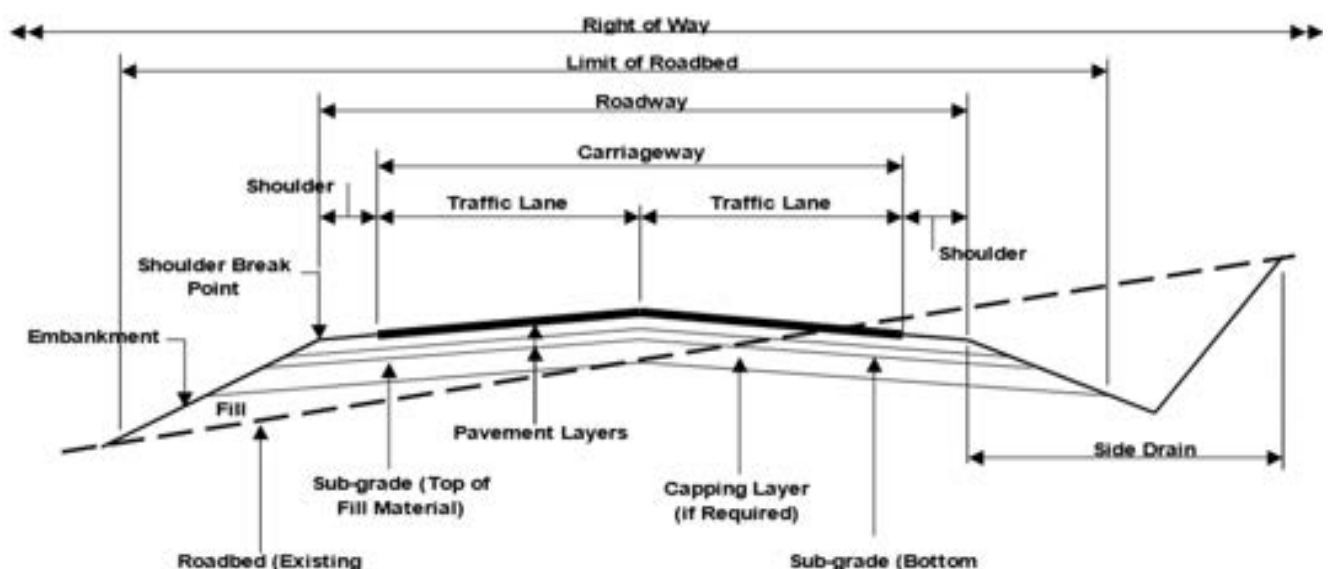
Flexible Pavement	Rigid Pavement
Layers (Bottom to Top) • Sub Grade (Formation level)- Natural Soil • Sub Base Course WMM – Gran- ular Material • Base Course/ GSB- crushed Stone/ gravel • Prime coat- Bonding/ sealing voids with granular layer. • Dense Based Macadam • (DBM)- water proofing layer • Track Coat- asphalt to bond surface • Bitumen Course (BC) – Top layer	Layers (Bottom to Top) • Sub Grade (Formation level)- Natural Soil • GSB • DLC (Dry lean Concrete • PQC (Pavement Quality concrete)- Top Layer
Uses • Rural/ Urban Roads • Hilly Terrain • Parking areas	Uses • High Strength areas • Highways/ expressways, Airport • Heavy traffic • Hot climates areas • Long Investment zones

Excerpt: Due to climatic changes, heavy losses have been encountered in the road/highways/expressways in the Himanchal belt in 2025/26.

Intense rainfall, frequent landslides, and sudden temperature fluctuations have significantly impacted the structural integrity of transportation networks. These events not only disrupted connectivity but also highlighted the urgent need for resilient road infrastructure capable of withstanding extreme weather conditions. Addressing these issues requires a strategic approach to pavement design, material selection, and maintenance planning to ensure long-term sustainability and safety.

Major challenges in construction of Roads in Hilly Terrain

- Hill cutting to achieve the designed road width can be carried out using either blasting or manual cutting, depending on the type and condition of the hills.
- Storage of Construction Material.
- Atmospheric Conditions
- Transportation of construction machinery.
- Slope Protection
- Types of protection walls are constructed.
- In sufficient Drainage.
- Traffic controlling
- Tunnelling work
- Construction of cut and cover tunnel
- Improper mapping of over the surface and under the surface natural springs and aquifers



Frequent claims Encountered in Road Projects

1. Soil Erosion

During heavy rainfall in hilly regions like Himachal Pradesh, fast-flowing water washes away the topsoil from slopes. This process reduces soil fertility and destabilizes the land, often leading to landslides.

Example: During the monsoon season, heavy rainfall in the hilly terrain of Himachal Pradesh causes rapid runoff. This runoff removes the topsoil from slopes, reducing soil fertility and destabilizing the land. In 2023, several areas near Kullu and Manali experienced severe soil erosion, which triggered landslides and damaged road infrastructure.



2. Carriageway Damage/Washout

Heavy rainfall, cloudbursts, or landslides can lead to severe damage or complete washout of the main carriageway.

Example: In the 2025 monsoon, continuous heavy rainfall on the NH-5 (Shimla–Rampur stretch), Himachal Pradesh, caused severe soil erosion beneath the carriageway, washing out a 50 meter road section. The subgrade failed, the asphalt collapsed into the valley, and traffic was disrupted for over two weeks. Emergency repairs used gabion walls and reinforced concrete retaining structures.



3. Surface Runoff on Finished Layer

Accumulation of foreign debris on the carriageway during land slide or maintenance activities.

When debris is removed using heavy machinery, the surface layer can become uneven or damaged, leading to improper drainage and water accumulation during rainfall.

This results in surface runoff, which accelerates pavement deterioration and may cause rutting or cracks.



4. Structural Settlement

Road settlement due to improper compaction or weak subsoil conditions.



5. Cracking and Potholes

Cracks develop from rainwater ingress, which eventually worsens into potholes.



6. Retaining Wall

Constructed along valley sides to prevent soil movement and provide stability.



7. Breast Wall

Built on hill-facing sides to support slopes and prevent erosion.



8. Culverts

Structures allowing water to pass beneath the road without obstructing the surface; typically made of hume pipes or RCC.



9. Road Buckling

Caused by poor-quality subsoil and materials, often due to negligence and poor workmanship.

Example;- During the heatwave, where temperatures rise. Several sections of the flexible pavement developed upward bulges and cracks, disrupting traffic flow.



10. Rutting

Depressions on the road surface caused by repeated movement of heavy traffic.

Example;- On NH-44 in Punjab during summer 2025, where heavy truck traffic combined with high temperatures caused rut depths exceeding 20 mm

11. Tunnelling work

Major Risk of tunnel is Squeezing/ shrinking, during earth movement, it will happen due to blasting, Earthquake, landslide and seepage of rainwater etc.

Example;- In the Himachal Pradesh Tunnel Project, squeezing was observed in soft rock zones during the monsoon season, primarily due to water ingress and increased overburden pressure caused by landslides.



12. Crash Barrier

Crash Barrier is a type of road safety barrier commonly installed along highways, expressways, and sharp curves to prevent vehicles from veering off the road.



Best Practices To Avoid Losses -

i. Design and Planning:

To avoid losses in road and tunnel projects, start with comprehensive design and planning. Conduct detailed geotechnical and hydrological investigations to ensure the structures meet IRC and MoRTH standards. Factor in traffic loads, climatic conditions, and geological risks such as landslides, floods, and seismic activity.

ii. Drainage Management:

Effective drainage is critical for both roads and tunnels. Roads should have proper surface and sub-surface drainage systems, adequate camber, and lined drains to prevent water stagnation. Tunnels must include drainage galleries, sump pits, and waterproofing systems to manage seepage and rainwater infiltration.

iii. Quality Control During Construction:

Ensure strict quality control throughout construction. This includes proper compaction of subgrade and base layers, use of tested materials for asphalt and concrete, and layer-wise inspections with documented field

density tests. These measures help maintain structural integrity and prevent premature failures.

iv. Structural Support for Tunnels:

In tunnels, install appropriate support systems such as rock bolts, shotcrete and steel ribs in weak zones. Use lining and waterproof membranes for TBM tunnels. These measures reduce risks of squeezing, shrinking, and collapse during earth movement.

v. Monitoring and Instrumentation:

Implement real-time monitoring systems in tunnels and critical road sections. Instruments help detect ground movement and stress changes early, enabling timely corrective actions.

vi. Preventive Maintenance:

Regular inspections are essential to identify cracks, rutting, and settlement in roads. Use pavement management systems for predictive maintenance and address erosion-prone areas immediately. For tunnels, periodic checks for seepage and structural

deformation are crucial.

vii. Emergency Preparedness:

Develop contingency plans for natural hazards such as landslides, floods, and earthquakes. Keep emergency repair materials and machinery ready and train personnel in rapid response and safety protocols to minimize downtime and losses.

Checklist for Maintenance of Operational Roads and associated structures

Roads and Highways (as per IRC:82-2015) Preventive Maintenance

Preventive	Frequency
Pothole identification and repair	Monthly or immediately after detection
Crack sealing and patching	Pre-monsoon (May–June) and post-monsoon (Oct–Nov)
Cleaning of drainage systems (culverts, ditches)	2–3 times a year (Pre-monsoon (May), mid-monsoon (July), post-monsoon (Sept–Oct))
Shoulder grading and stabilization	Quarterly
Road surface sweeping and debris removal	Weekly or Biweekly
Vegetation control (trimming, mowing)	Quarterly
Drainage system upgrades	Pre-monsoon
Pavement marking refresh frequency	Pre-monsoon and post-monsoon
Resurfacing (overlay or micro-surfacing)	Every 3–5 years
Rutting	Post Monsoon
Signage inspection and replacement	Pre-monsoon and post-monsoon

Bridges (as per IRC:SP:35-2015 and IRC:70-2017)

Preventive	Frequency
Structural Health Monitoring	Every 2–5 years (or as per bridge importance and traffic volume)
Cleaning of drainage systems	Quarterly (Removal of debris, silt, vegetation)
Painting of steel components	Every 5 Years (Anti-corrosion coatings)
Crack sealing and surface coating	Annually (Epoxy or polymer sealants)
Lubrication of bearings	Annually (Lubrication of bearings)
Minor repairs to joints and seals (Sealant replacement, bolt tightening)	Annually
Visual inspections	Monthly (Surface checks for cracks, spalling)

Howden India Team



Rajesh Kumar Singh
Executive President & National Head
Property & Risk Management

+91-9820424998
rajesh.singh@howdengroup.com



Mani Trivedi
Executive Vice-President
Property & Risk Management

+91-9148155696
mani.trivedi@howdengroup.com



Yogesh Tuteja
Sr. Manager
Property & Risk Management

+91-8802423701
yogesh.tuteja@howdengroup.com



<https://www.howdengroup.com/in-en>

This document or any portion of the information it contains may not be copied or reproduced in any form without the permission of Howden.

Howden Insurance Brokers India Private Limited (Howden India) is an associate of the Howden Broking Group Limited, UK, the broking arm of the Hyperion Insurance Group. Howden Insurance Brokers India Private Limited is authorized and regulated by the Insurance Regulatory & Development Authority of India under License number 263. License Validity Period: 18/05/25 to 17/05/28, CIN: U67200MH2004PTC144558. Broker category: Composite. Registered in India with registered office at 6th Floor, Peninsula Chambers, Peninsula Corporate Park, Ganpatrao Kadam Marg, Lower Parel, Mumbai – 400 013, India.