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TUNNELLING IN INDIA 2019

Segment Analysis, New Opportunities and Future Outlook

- ❖ Report (PDF)
- ❖ Data-set (Excel)

Key Takeaways

- India Infrastructure Research has analysed over 1,628 tunnels spread across three stages of development - completed, under construction and awarded. Of these, 77 per cent have been completed, 20 per cent are under construction and the remaining 3 per cent have been recently awarded. These tunnels span over 3,418 km.
- As per the data collected and analysed by India Infrastructure Research for completed, ongoing and awarded projects, drill and blast method (DBM) is the most common tunnelling method, used for over 38 per cent of tunnel works. Deployment of advanced/mechanised technologies such as tunnel boring machines (TBMs), is slowly increasing, with a share of 24 per cent.
- This is closely followed by the New Austrian Tunneling Method (NATM), which is increasingly being used across sectors. For the railways and roads sectors, a significant proportion of the ongoing projects are using the more advanced NATM technique, in sharp contrast to drill and blast used for completed projects.

Key Constraining Factors

- Geologic surprises are one of the biggest challenges in tunnel construction. Complexities in the Himalayan region such as difficult terrain conditions, thrust zones, shear zones, in-situ stresses, rock cover, ingress of water or gases, geothermal gradient, high level of seismicity etc. affects the tunnelling activity.
- Inadequate investigations, inappropriate budget and time allocation for site investigation and improper proper assessment of geological-geotechnical conditions affects tunnelling activity.
- Ambiguity in the design of construction contracts also affects the progress of tunnel construction.
- High safety risks and inadequate safety measures are other challenges in tunnel construction.

Sector Outlook

- According to India Infrastructure Research, the tunnelling segment offers a lucrative pipeline of 1,489 tunnels spanning 4,144 km in various stages - under implementation, awarded, under bidding, announced, approved, planned/proposed and stalled.
- About 280 tunnels spanning a length of over 890 km, are targeted for completion by 2021-22. Besides, 137 tunnels (spanning over 630 km) having long gestation periods are expected to be completed by 2026.
- With regard to technique/method of tunnelling, DBM will continue to be a preferred method for hydro tunnels. Other sectors like rail and roads will move towards adopting the advanced technology of NATM. Meanwhile, TBMs will continue to dominate the metro, irrigation and water supply sectors.
- The micro-tunnelling technique will gain prominence for laying deep water supply and sewer lines in areas where open cut tunnelling is not feasible due to existing surface utilities.
- With regard to equipment, the experience thus far indicates greater inclination towards the adoption of conventional techniques such as DBM in hydropower segment, which offers the maximum tunnelling opportunity (albeit the maximum number of stalled projects). Thus, there will be higher demand for simple equipment like drillers, excavators, loaders, cranes, etc. With mechanised methods like TBM and NATM gaining prominence owing to tunnelling activity in congested urban spaces, demand for equipment such as cutter heads, shield machines, augers, gantry, pressure transducers, hydraulic filters, etc. will increase.
- All-inclusive, the tunnel market is expected to accelerate in the coming years. This will, in turn, translate into huge opportunities for the contractors, consultants, equipment providers and material suppliers.

SECTION I: MARKET ANALYSIS, UPCOMING PROJECTS AND OPPORTUNITIES

1. Overview

- ❖ Size and Growth
- ❖ Key Trends
- ❖ Recent Developments
- ❖ Growth Drivers
- ❖ Issues and Challenges
- ❖ Future Outlook

2. Project Pipeline

- ❖ Overall Project Pipeline
- ❖ Analysis by Segment
 - Hydropower
 - Irrigation
 - Railways
 - Roads
 - Metro
 - Water Supply
 - Sewerage
- ❖ Analysis by Stage of Implementation
- ❖ Analysis by State
- ❖ Analysis by Completion Period
- ❖ Top 50 Upcoming Projects

3. Market Opportunities

- ❖ Investment Projections (till 2026-27)
- ❖ Opportunities for Stakeholders
 - EPC Contractors
 - Technology Providers
 - Equipment Suppliers
 - Construction Material Suppliers
 - Consultants

4. Analysis of Key Players

- ❖ Snapshot of Major Players
- ❖ Market Structure
- ❖ Project Portfolio
 - Key Completed Projects
 - Key Ongoing Projects
- ❖ Financial Performance
- ❖ Future Plans

5. Risks and Challenges

- ❖ Contractual Issues
- ❖ Construction Complexities
- ❖ Equipment-related Issues
- ❖ Manpower Issues
- ❖ Other Issues

SECTION II: SEGMENT ANALYSIS

6. Metro Rail Tunnels

- ❖ Size and Growth
 - Overall Size
 - By State
 - By Technique/Method
- ❖ Analysis of Completed Projects
- ❖ Key Completed Projects
- ❖ Analysis of Ongoing Projects
- ❖ Key Ongoing Projects
- ❖ Select Case Studies and Lessons Learnt
- ❖ Analysis of Upcoming Projects
- ❖ Key Upcoming Projects
- ❖ Issues and Challenges
- ❖ Segment Outlook and Projections

7. Railway Tunnels

- ❖ Size and Growth
 - Overall Size
 - Analysis by State
 - Analysis by Technique/Method
- ❖ Analysis of Completed Projects
- ❖ Key Completed Projects
- ❖ Analysis of Ongoing Projects
- ❖ Key Ongoing Projects
- ❖ Analysis of Upcoming Projects
- ❖ Key Upcoming Projects
- ❖ Issues and Challenges
- ❖ Segment Outlook and Projections

8. Hydro Tunnels

- ❖ Size and Growth
 - Overall Size
 - Analysis by State
 - Analysis by Technique/Method
- ❖ Analysis of Completed Projects
- ❖ Key Completed Projects
- ❖ Analysis of Ongoing Projects
- ❖ Key Ongoing Projects
- ❖ Analysis of Upcoming Projects
- ❖ Key Upcoming Projects
- ❖ Issues and Challenges
- ❖ Segment Outlook and Projections

9. Road Tunnels

- ❖ Size and Growth
 - Overall Size
 - By State
 - By Technique/Method
- ❖ Analysis of Completed Projects
- ❖ Key Completed Projects
- ❖ Analysis of Ongoing Projects
- ❖ Key Ongoing Projects
- ❖ Select Case Studies and Lessons Learnt
- ❖ Analysis of Upcoming Projects
- ❖ Key Upcoming Projects
- ❖ Issues and Challenges
- ❖ Segment Outlook and Projections

10. Water Supply and Sewerage Tunnels

- ❖ Size and Growth
 - Overall Size
 - By State
 - By Technique/Method
- ❖ Analysis of Completed Projects
- ❖ Key Completed Projects
- ❖ Analysis of Ongoing Projects
- ❖ Key Ongoing Projects
- ❖ Select Case Studies and Lessons Learnt
- ❖ Analysis of Upcoming Projects
- ❖ Key Upcoming Projects
- ❖ Issues and Challenges
- ❖ Segment Outlook and Projections

11. Irrigation Tunnels

- ❖ Size and Growth
 - Overall Size
 - By State
 - By Technique/Method

- ❖ Analysis of Completed Projects
- ❖ Key Completed Projects
- ❖ Analysis of Ongoing Projects
- ❖ Key Ongoing Projects
- ❖ Select Case Studies and Lessons Learnt
- ❖ Analysis of Upcoming Projects
- ❖ Key Upcoming Projects
- ❖ Issues and Challenges
- ❖ Segment Outlook and Projections

SECTION III: CONSTRUCTION TECHNIQUES, EQUIPMENT AND MATERIALS

12. TBM Market Size and Outlook

- ❖ Size and Growth
- ❖ Types of TBM
- ❖ Market Trends
- ❖ Technological Advancements
- ❖ Key Projects (using TBMs)
- ❖ TBMs deployed in Metro Rail Projects
- ❖ Distinguishing Features of TBMs Deployed
- ❖ Issues and Challenges
- ❖ Future Outlook

13. Other Construction Techniques (Drill & Blast and NATM)

- ❖ Size and Growth
 - DBM
 - NATM
 - Conventional Techniques
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- ❖ Market Trends
- ❖ Technological Advancements
- ❖ Key Projects
 - DBM
 - NATM
 - Conventional Techniques
- ❖ Issues and Challenges
- ❖ Future Outlook

14. Equipment Market

- ❖ Size and Growth
 - Overall Size
 - DBM Equipment Market
 - TBM Equipment Market
 - NATM Equipment Market
- ❖ Import of Tunnelling Machinery
- ❖ Types of Equipment
- ❖ TBM Equipment Providers - Services
- ❖ Other Equipment Suppliers
- ❖ New Innovations and Advancements
- ❖ Issues and Challenges
- ❖ Future Outlook

15. Materials Market

- ❖ Size and Growth
- ❖ Types of Materials Used in Tunneling
- ❖ Market Trends
- ❖ New Materials and Innovations
- ❖ Future Outlook

SECTION IV: DATABASE OF KEY PROJECTS

A comprehensive database of key tunnelling projects across the metro, rail, hydropower, road, water supply & sewage, and irrigation sectors. Each project will provide information on:

- Number of Tunnels
- Tunnel Length
- Project Cost
- Current Status
- Contractor
- Tunnelling Method
- Tunnel Shape
- Diameter
- Completion Date
- Etc.

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