INDIAN RAILWAYS

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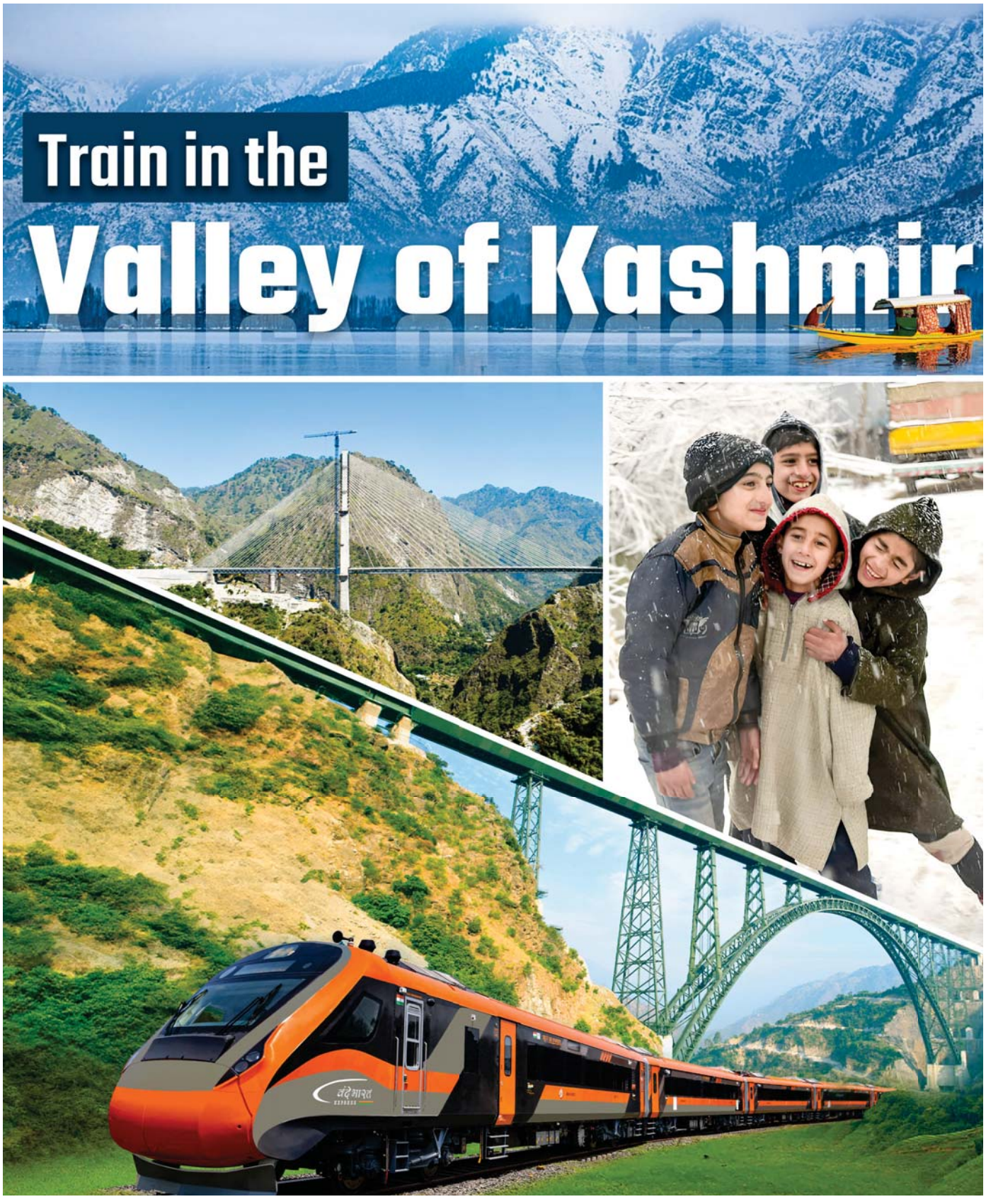
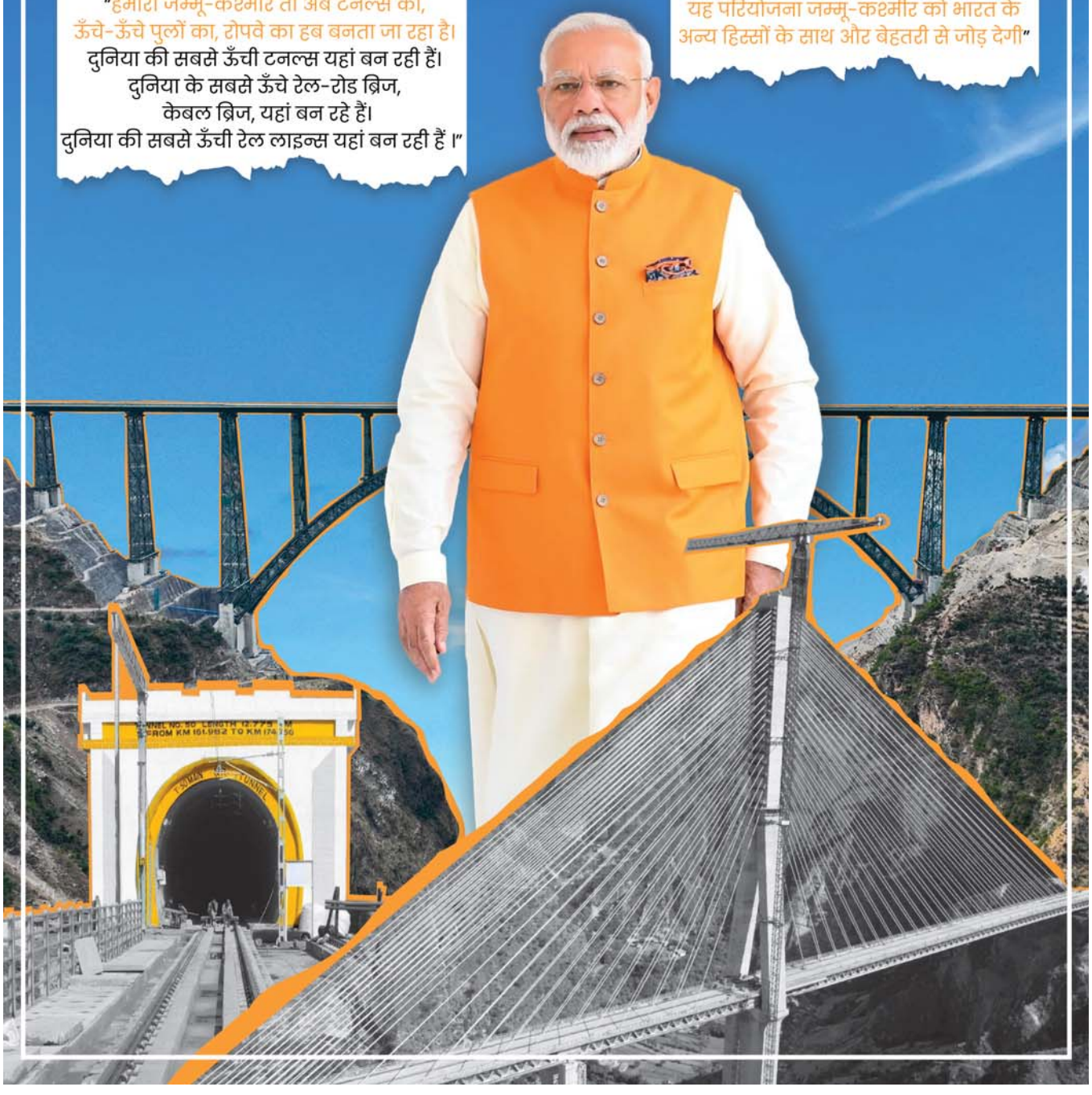


"उधमपुर-श्रीनगर-बारामूला रेल लाइन परियोजना
के तहत दुनिया का सबसे ऊँचा रेलवे आर्च ब्रिज - चिनाब का
काम पूरा हुआ है। अंजी खड्ड ब्रिज जो देश का पहला
केबल आधारित रेल ब्रिज है, वो भी इसी परियोजना का हिस्सा है।
ये दोनों इंजीनियरिंग के बेजोड़ उदाहरण हैं।
इनसे इस क्षेत्र में आर्थिक प्रगति होगी
और समृद्धि को बढ़ावा मिलेगा "

"पेरिस के जिस एफिल टावर की इतनी चर्चा होती है,
जहां लोग सेल्फी खींचने जाते हैं,
ये चिनाब ब्रिज उससे भी 35 फीट ऊँचा है।
आज दुनिया भर में हमारे खूबसूरत
चिनाब ब्रिज की तस्वीरें छाई हुई हैं।"

"हमारा जम्मू-कश्मीर आज
रेल इंफ्रास्ट्रक्चर में नए रिकॉर्ड बना रहा है।
उधमपुर-श्रीनगर-बारामूला रेल लाइन,
इसकी चर्चा आज पूरे देश में है।
यह परियोजना जम्मू-कश्मीर को भारत के
अन्य हिस्सों के साथ और बेहतरी से जोड़ देगी"

"हमारा जम्मू-कश्मीर तो अब टनल्स का,
ऊँचे-ऊँचे पुलों का, रोपवे का हब बनता जा रहा है।
दुनिया की सबसे ऊँची टनल्स यहां बन रही हैं।
दुनिया के सबसे ऊँचे रेल-रोड ब्रिज,
केबल ब्रिज, यहां बन रहे हैं।
दुनिया की सबसे ऊँची रेल लाइन्स यहां बन रही हैं।"



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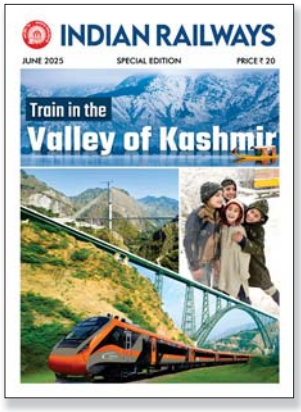


Editorial

The Udhampur-Srinagar-Baramulla Rail Link (USBRL) is one of Indian Railways' most ambitious and technically challenging projects. Beyond being a marvel of engineering, it stands as a powerful symbol of national unity, strategic strength and socio-economic progress. Conceived in 1997-98, the project's core vision was to establish a reliable all-weather railway connection to the Kashmir Valley, which had long remained cut off from the national mainstream due to extreme terrain, harsh weather and inadequate infrastructure.

Realizing this vision was no ordinary feat, it demanded unparalleled commitment, precise planning and relentless effort from the engineers, technicians and workers of Indian Railways. The terrain of the Himalayas, prone to landslides, earthquakes and weather-related disruptions, presented enormous obstacles. Yet, the workforce overcame every challenge, proving that no dream is too big when backed by determination and innovation.

Among USBRL's engineering milestones, the construction of the Chenab Bridge stands out as a historic achievement. At a height of 359 meters, it is the world's tallest railway bridge—taller than the Eiffel Tower—and is built to withstand wind speeds of up to 266 kmph and earthquakes of zone-V intensity. Equally significant is the 11.2 km Pir Panjal tunnel, one of India's longest railway tunnels, built with state-of-the-art technology and highest safety standards.

This infrastructural marvel has unlocked a new era for Jammu & Kashmir. The introduction of high-speed trains like the Vande Bharat Express has drastically reduced travel time, improved passenger comfort and enhanced connectivity between Srinagar and key cities like Jammu, Delhi and Katra. Tourism has witnessed a resurgence, with easier access encouraging more visitors throughout the year. Local artisans, fruit growers and small entrepreneurs now have a faster and more cost-effective way to access national markets, fuelling local economic growth.

Strategically, USBRL is of immense importance. It ensures seamless and year-round connectivity to the border state of Jammu & Kashmir, vital for swift, military logistics and troop movement. In times of conflict or natural disasters, the rail link enables rapid deployment of resources, strengthening national defense and disaster response capabilities.

The USBRL project is a testament to India's resolve and the transformative power of infrastructure. It reflects the vision of 'Ek Bharat, Shreshtha Bharat' by not only bridging geographical gaps but also uniting people, empowering communities and reinforcing national integration. Indian Railways, through this monumental effort, has shown that it is not merely a transportation network, but a force for unity, security and prosperity.

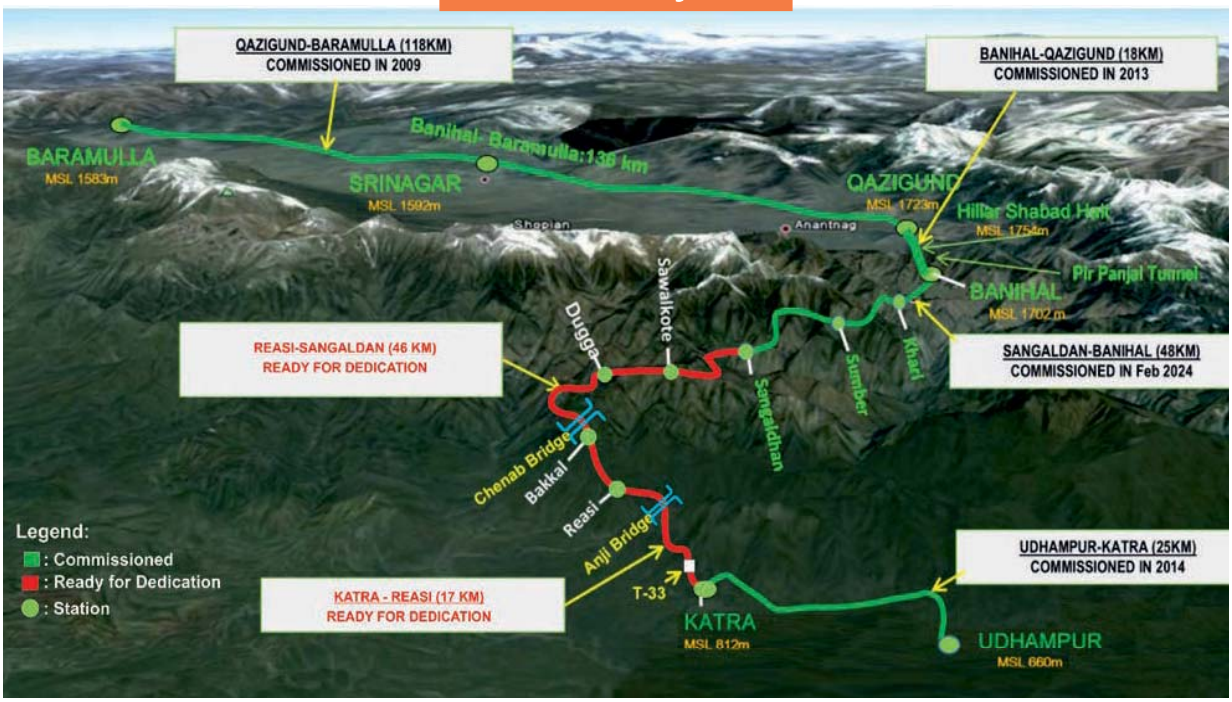
Do share your feedback on this issue with us!

Railways In Kashmir Valley

USBRL: A Game Changer for Holistic Development in the Himalayan Region

- To provide an alternative and a reliable all-weather transportation system to Jammu & Kashmir, Govt. of India planned connecting the Kashmir valley with the Indian Railways network by the ambitious Udhampur-Srinagar-Baramulla Rail Link Project (USBRL) in 1999. It was declared a National Project in 2002.
- A construction marvel in the tough Himalayan terrain the Udhampur-Srinagar-Baramulla Rail Link (USBRL) will prove to be a game changer in the overall development of this hilly region, generating immense opportunities for transport, trade and tourism in the long run.
- This project has by far been the most challenging work undertaken post-independence by Indian Railways. The alignment of USBRL involved construction of a large number of Tunnels and Bridges in highly rugged and mountainous terrain with most difficult and complex Himalayan geology.
- The project has 38 tunnels with a total length of 119 km. The Sumber-Khari T-50, 12.75 km and the Pir Panjal T-80, 11.2 km, are India's longest transportation tunnels. There are 931 bridges having combined length of 13 km. The Chenab Bridge (Bridge-44), the highest railway bridge in the world and Anji Bridge (Bridge-35), Indian Railways' first cable stayed rail bridge are special bridges on the project.
- Electrification of the entire 272 km rail line has been completed. The trains will run on electric power instead of diesel. This move will help in phasing out use of fossil fuel in train operation in the ecologically sensitive Himalayan region. This will also cut down on train running cost, reduce carbon footprint and project Railways as a sustainable and eco-friendly mass transportation system.
- Three agencies; IRCON, KRCL and Northern Railway with extensive experience in construction of rail lines were involved in this project. Many international agencies and premier Indian institutes like IIT Roorkee, IIT Delhi, DRDO and Geological Survey of India have provided expertise in planning and implementation.

USBRL Project



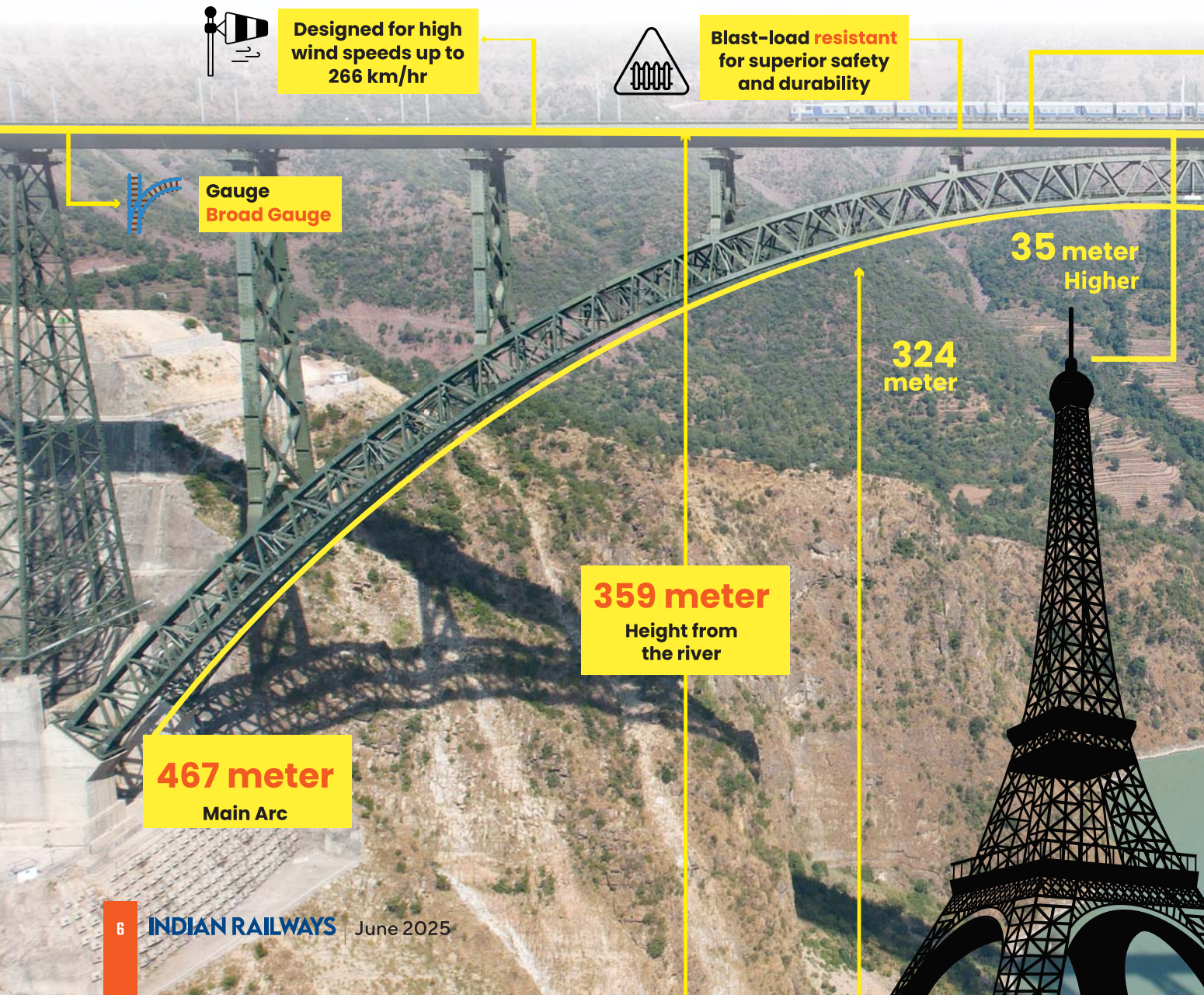
ELEVATING KASHMIR'S

Connectivity with Chenab Bridge

Where snow-capped peaks meet the sky and the Chenab carves deep into the earth, India has etched its resolve in steel. The Chenab Bridge, now the world's highest railway bridge, rises 359 meter above the riverbed, standing as a symbol of engineering excellence and national ambition.

Part of the Udhampur-Srinagar-Baramulla Rail Link (USBRL) project, the bridge connects not just terrain but aspirations — linking the Kashmir Valley to the rest of India with an all-weather, reliable rail route.

Stretching 1315 meter across the Chenab River near the Salal Dam, the bridge features a stunning main arch span of 467 meter and can withstand wind speeds up to 266 kmph. It surpasses the Eiffel Tower in



height and is nearly five times taller than the Qutub Minar from riverbed to rail level.

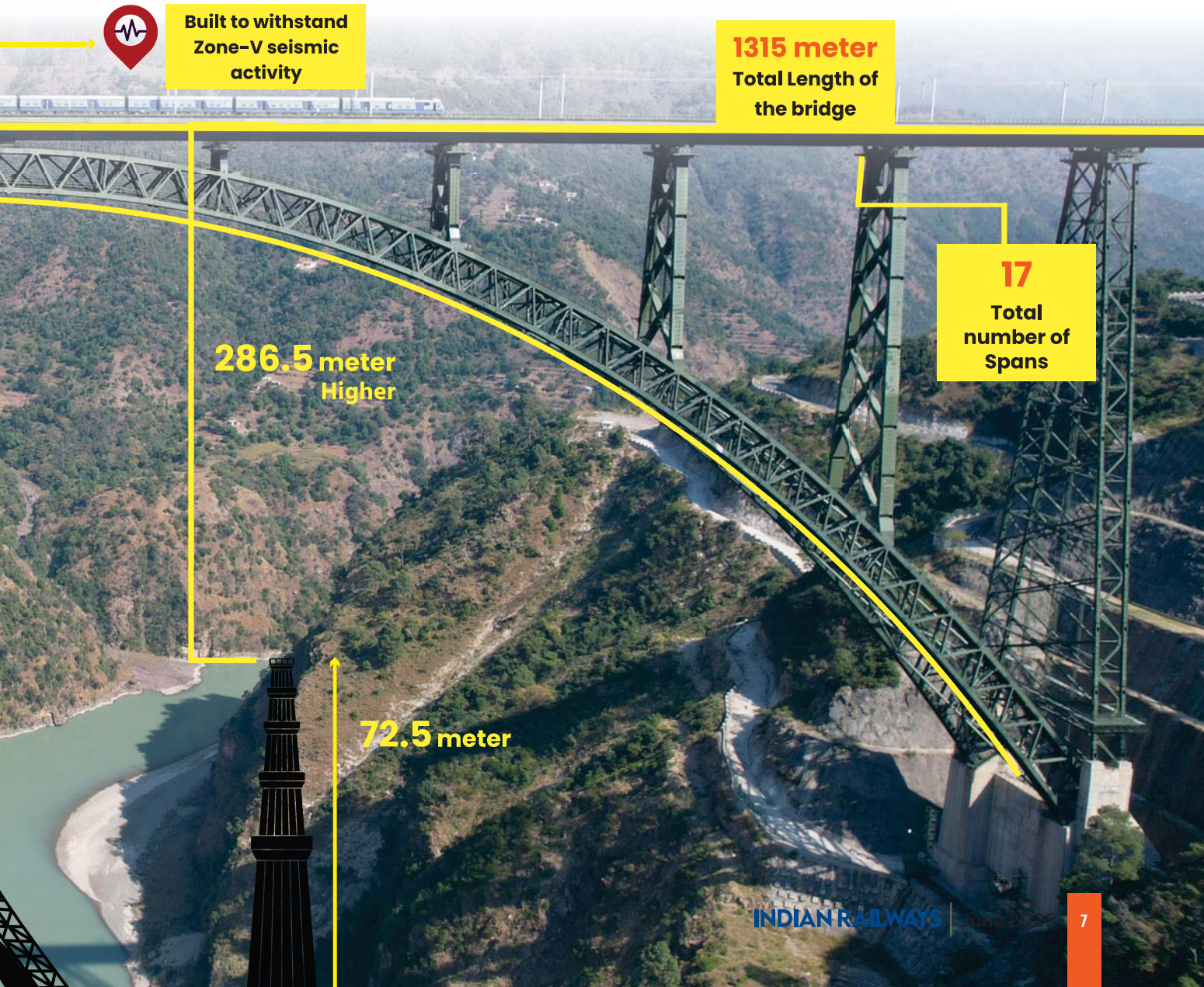
The construction of this engineering marvel involved over 28,000 metric tonnes of steel and introduced a first-of-its-kind cable crane system in Indian Railways — used to ferry materials across a 915 meter wide gorge with two massive cable cars and pylons towering over 100 meter high.

Built in the geologically complex and unstable terrain of the Himalayas, the Chenab Bridge is more than a feat of infrastructure — it is a symbol of India's grit, innovation and unwavering resolve to bring progress to even the most remote corners.

As it stands tall over the Chenab, the bridge does not just connect two mountains — it connects dreams, development and a new era for Jammu & Kashmir.

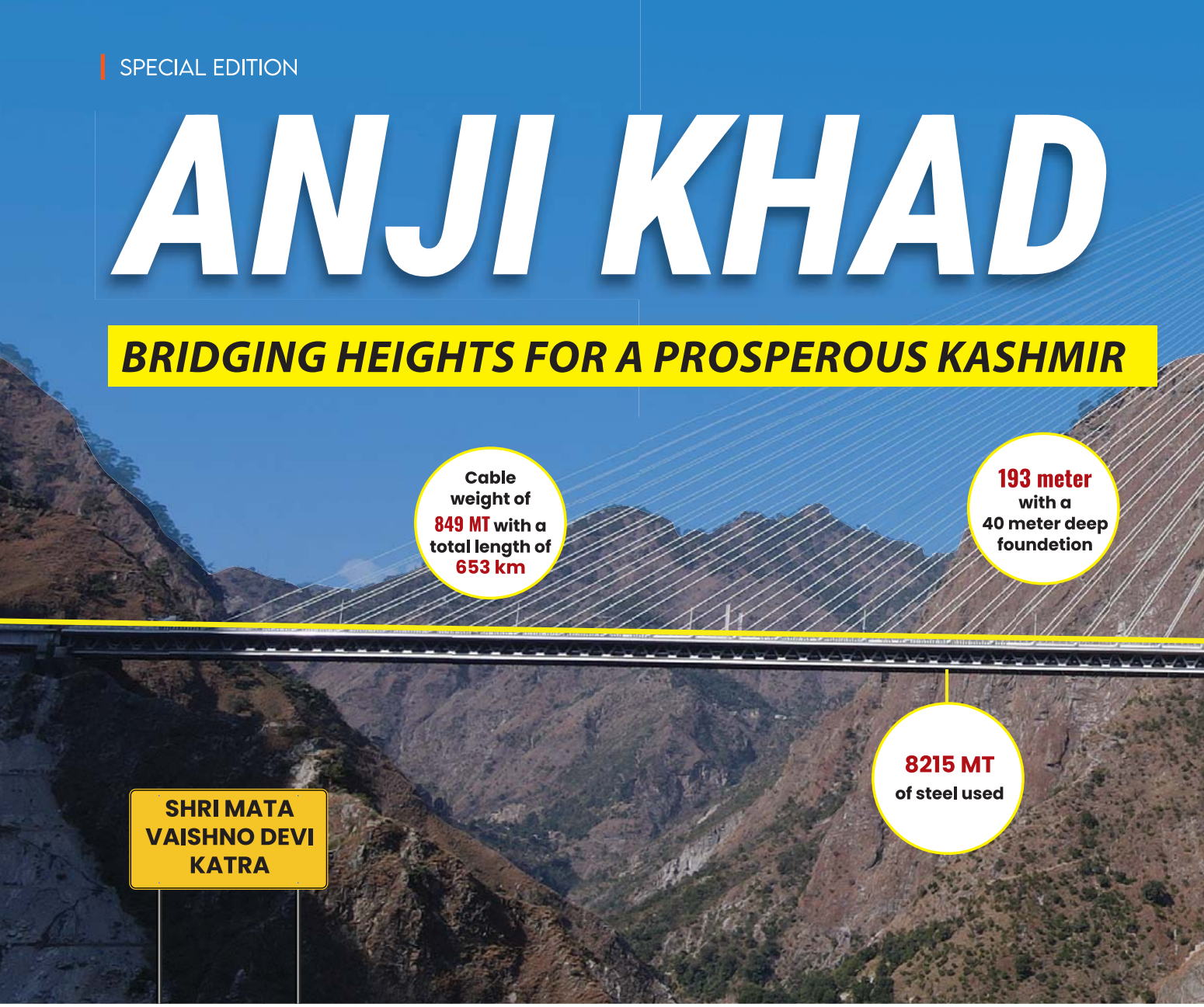
'The iconic Chenab Bridge is an example of such new chapters and dimensions of development materialised by the inspiring leadership of the Hon'ble Prime Minister.'

-Ashwini Vaishnaw,
Minister of Railways



ANJI KHAD

BRIDGING HEIGHTS FOR A PROSPEROUS KASHMIR

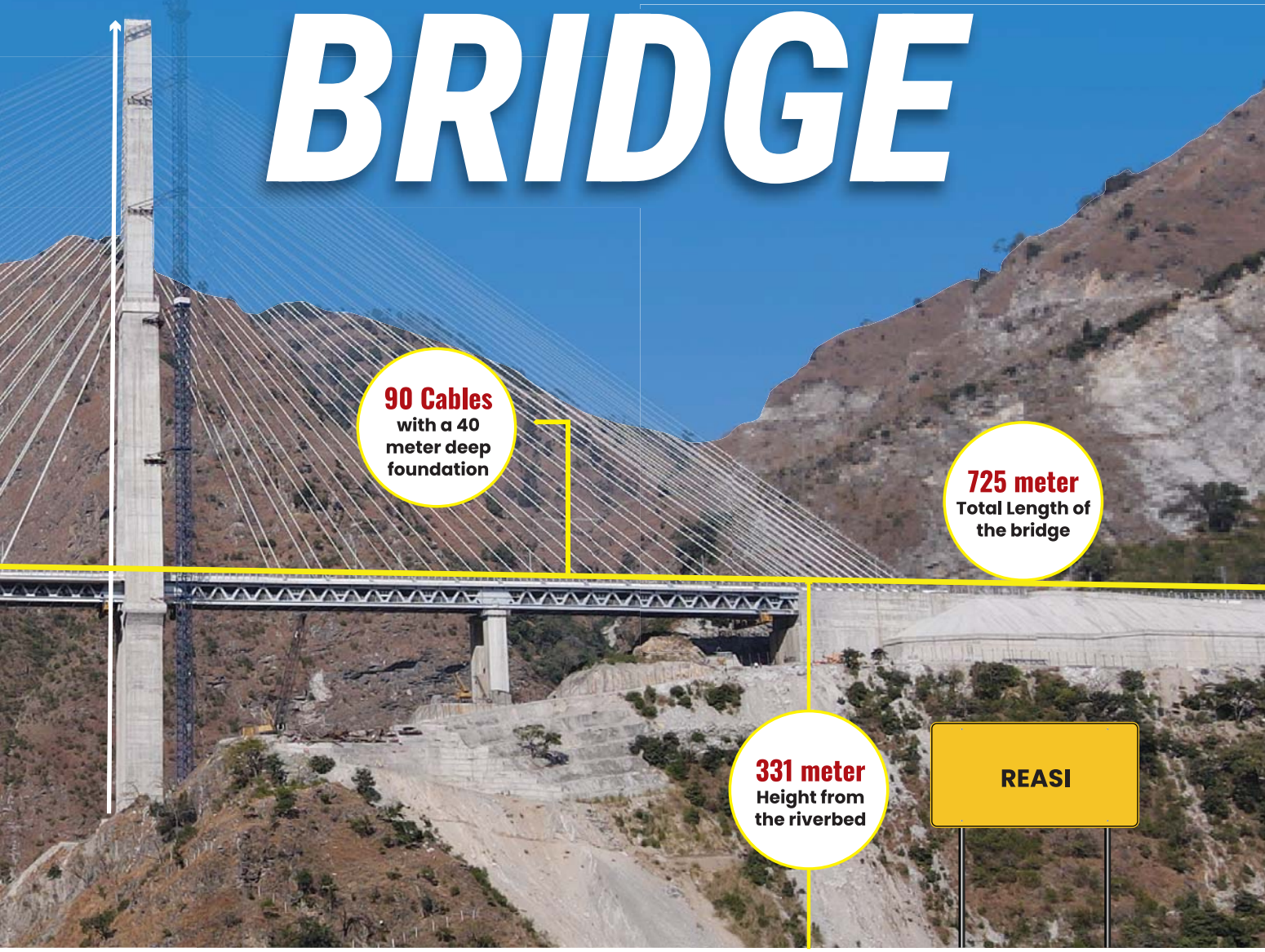


Anji Khad Bridge, India's first cable stayed railway bridge, soars high, spanning the deep embrace of the Anji River, south of the iconic Chenab Bridge. This monumental Bridge is not just a structure—it is a dream realised, a testament to human ingenuity defying nature's fiercest challenges.

Connecting the Katra-Banihal section of the Udhampur-Srinagar-Baramulla rail line, this cable-stayed marvel stands about 80 km from Jammu city, nestled in the awe-inspiring Himalayan landscape. Set against the backdrop of snow capped peaks, the bridge stands firm, enhancing connectivity and easing travel across the region. Built amidst the young fold mountains, the Anji Khad Bridge conquers unpredictable geology, weathering seismic tremors, tempestuous winds and the test of time.

Towering 331 meter above the riverbed, it stretches 725 meter across the abyss, supported by 96 high-tensile cables ensuring stability. It has an inverted Y pylon which rises to height of 193 meter from the top of the foundation. Over 8215 metric tonnes of structural steel fortify its core, ensuring that this bridge does not just exist—it thrives.

BRIDGE



With its grand inauguration on the horizon, the Anji Khad Bridge is set to transform lives, bridging distances and forging bonds. It will usher in an era of economic growth, where trade flourishes, tourism blossoms and communities unite under its unwavering presence.

Part of the Udhampur-Srinagar-Baramulla Rail Link (USBRL) project, this bridge is more than just metal and stone—it's a testament to India's vision. A bridge that symbolises progress, it paves the way for prosperity and is a symbol of resilience and hope. A silent sentinel, it watches over the land, inspiring generations with its unwavering presence.

Once operational, the Anji Khad Bridge will usher in a new era of seamless travel, reduced transit time and economic growth, strengthening Jammu & Kashmir's role as a hub for tourism and trade. A symbol of progress and resilience, this bridge will connect aspirations, empower communities and pave the way for a brighter future.

Connecting Kashmir

Socio-Economic Growth and the Spirit of Resilience

A K Khandelwal
Ex. Member
Railway Board

Brief history and timeline: Linking Kashmir with Indian Railways' network is centuries old dream. The first idea for building a narrow gauge rail link to the Kashmir Valley was mooted over a century ago, when foundation stone laid for Jammu – Srinagar rail link by Maharaja Pratap Singh on 1st March 1892, later in 1898 by Maharaja Ranbir Singh. Four viable routes were found to link Punjab with Srinagar and the Kashmir Valley, the Banihal route from Jammu, the Poonch route via the Jhelum Valley, the Panjar route from Rawalpindi also via the Jhelum Valley and the Abbottabad route from Kalako Serai through Hazara in the upper Jhelum Valley. Detailed surveys were conducted for a mix of meter and broad gauge tracks. However, the inhospitable climate, the tricky terrain, restricted resources and history confined this idea to survey reports and drawing boards.

In 1905 the British also revisited the idea and Maharaja Pratap Singh agreed to the line between Jammu and Srinagar via Reasi following the Moghul road. This plan envisaged a narrow gauge track to cross the Pir Panjal range, but the project remained a dream only.

The project was considered several times after independence also, but it was only in the year 1981 that sanction was given for the Jammu-Udhampur Rail link project.

In 1994-95, the final rail link between Udhampur–Srinagar–Baramulla (USBRL) was sanctioned and

Maharaja Sri Pratap Singh

in the year 2002, the Central Government declared this railway line a National Project.

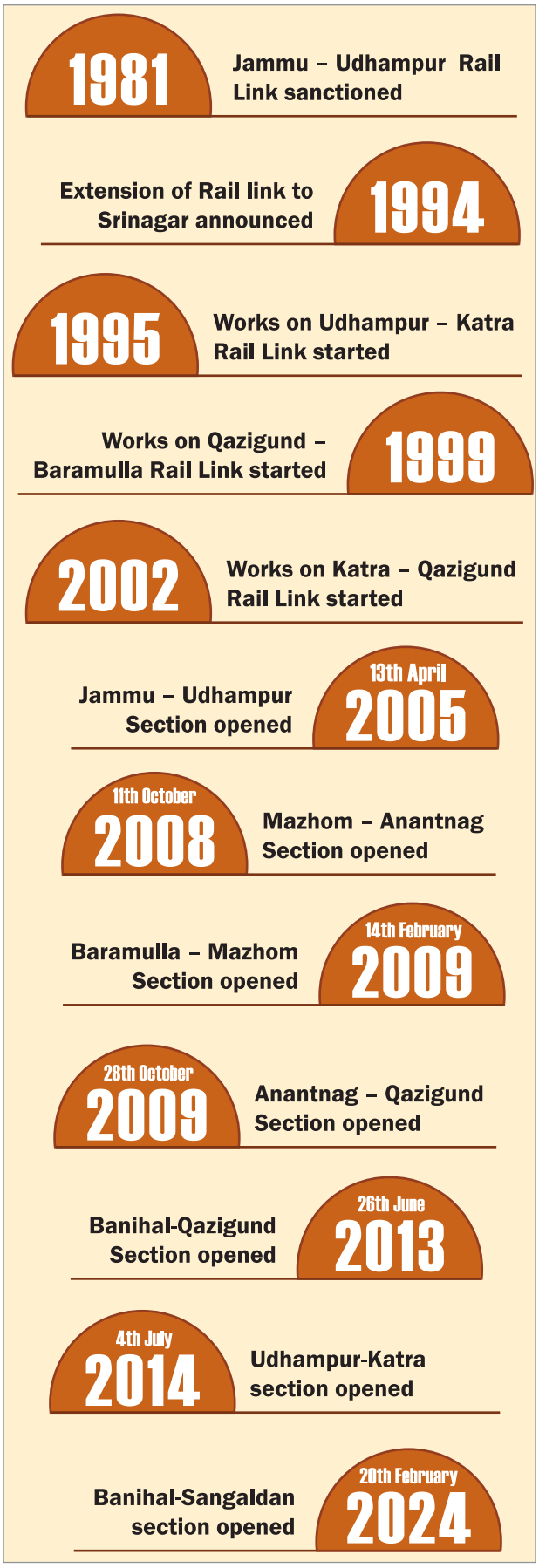
Some of the important key events/milestones during the journey of making reality the dream of connecting Kashmir valley with the network of Indian Railways are as follows:

SOCIO-ECONOMIC DEVELOPMENTS

1. Employment generation:

a. **Direct employment by Railways for land losers:** Government has issued a policy for appointment of member of land losers, whose more than 75% land has been acquired by Railways. Against this policy, government jobs for 804 eligible beneficiaries were given by Railways.

b. **Indirect employment through executing agencies:** In this project, 14,069 employment



was given by project executing agencies during construction period. Among which 65% employment was given to locals of J&K.

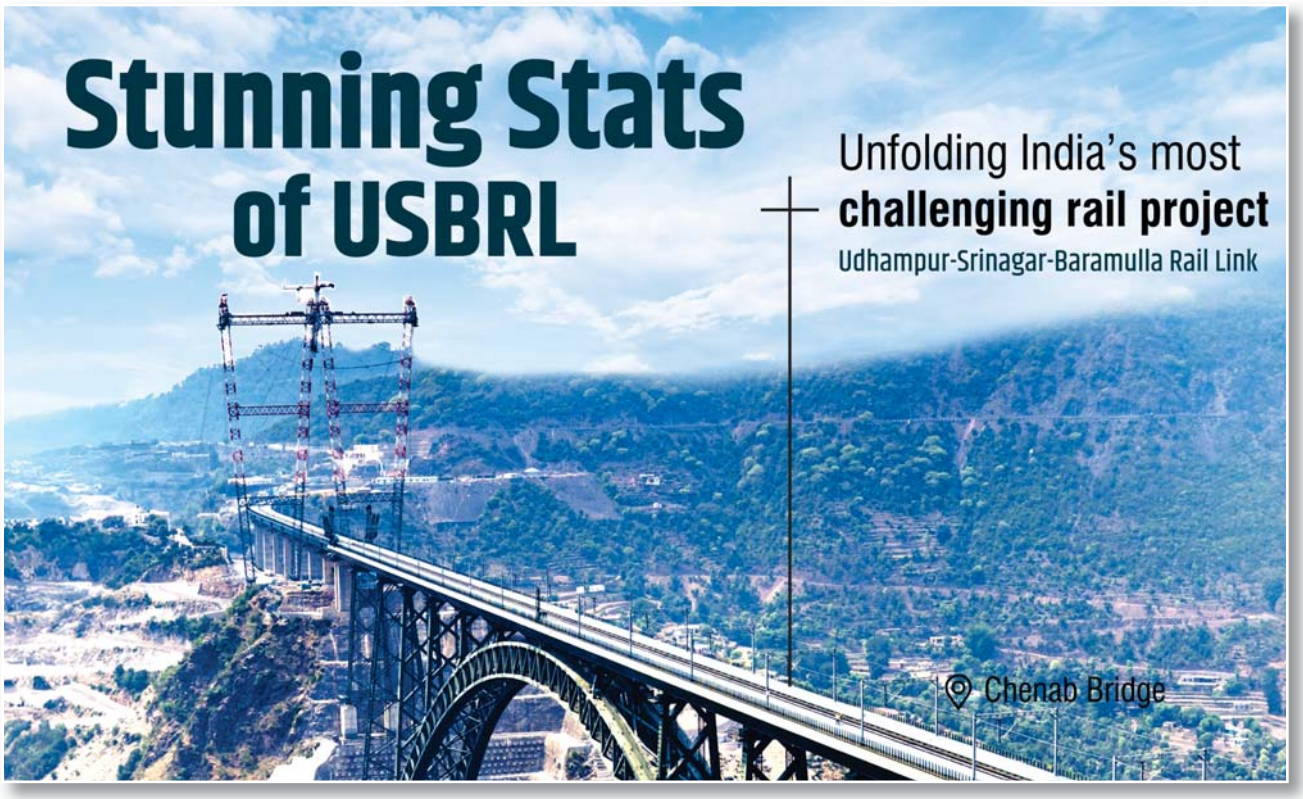
c. More than 525 lakh man days of employment have been generated on this project.

2. **Skilled development for local artisans:** All the works on USBRL project whether, tunnelling, bridge works, electrification, track laying, electro-mechanical works are highly specialized and executed through state-of-the-art technology and methods. Tremendous skill development of the local artisans and workers were resulted and now these workers are successfully working as trained skilled workers on other precious projects of the country.

3. **Accessibility:** The project sites were highly inaccessible and militancy intensified during the period of inception. With the inception of this project, construction of access road commenced in these remote locations. USBRL has constructed more than 215 km approach roads to provide access for tunnel and bridges

MI 26 Helicopter transporting a dumper from Jammu to Surukote in October 2010, a remote location between Reasi and Sangaldan

Heli-lifting of excavator to Surukot on 31st October, 2010



sites. The construction of these approach roads are very challenging in itself due to difficult climatic conditions, treacherous terrain, unstable Himalayan geology and law and order issues.

With a view to accelerate progress of construction of approach road up to most remote part of project, i.e Sawalkote, airlift of heavy construction machineries using army helicopters from Jammu airport was done. A table top helipad was constructed by levelling a 100 meter x 40 meter stretch of land near Surukote village in between Dugga and Sawalkote using mere hand tools. MI-26 Helicopters were used for heli-lifting of heavy construction machines, sorties had been conducted and 226 MT load was air lifted to Surukot.

With the completion of these approach roads, the connectivity of large number of surrounding villages such as Guni, Paikhad, Gran, BatalGala, Bakkal, Kauri, Dugga, Surukot, Sawalkot, Basindhadhar, Ind, Baralla, Sangaldan, Talwa, Dharam, Kholi, Megdar, Sumbar, Urnihal, Siran, Kundan, Khari, Hingni, Arpinchala, Tatnihal, Chaplain, Bankoot etc. to name a few in Jammu & Kashmir have drastically improved. It has ensured connectivity to about 70 villages consisting of about 1.5 lac population.

Earlier, the access to these villages was primarily through footpaths or by boat to some extent. Locals would walk along slippery slopes and rock ridges of the hardest, torn terrain to reach the township having roads and means of transport to travel to district headquarters and other places. These villages were cut-off from civilization due to lack of roads.

It would be worthwhile to witness the changing landscape of commercial activities in these villages with the opening of market places, repair workshops, roadside local restaurants (dhabas) etc. it has opened up new avenues and vistas of opportunities to remotely located population.

These remote villages and towns, which were bereft of even the most basic facilities, are becoming centre of learning and commercial activities.

4. Enhanced Connectivity and Improved Transportation

The USBRL project provides faster and more reliable transport options, reducing travel

time significantly. This improved connectivity benefits both people and goods, enabling better movement between remote and urban areas. The railway line connects key pilgrimage sites like Amarnath Cave temple, Hazratbal shrine, Charar-e-Sharif, etc. and beautiful picturesque Kashmir valley, attracting more devotees and tourists to the region. This boosts the tourism industry, leading to increased business for local hotels, restaurants and other services.

5. Economic Growth

i. Boost to Local Businesses: With improved access to national markets, local businesses, especially those involved in agriculture, handicrafts and local products, can now reach larger markets, driving sales and revenue growth.

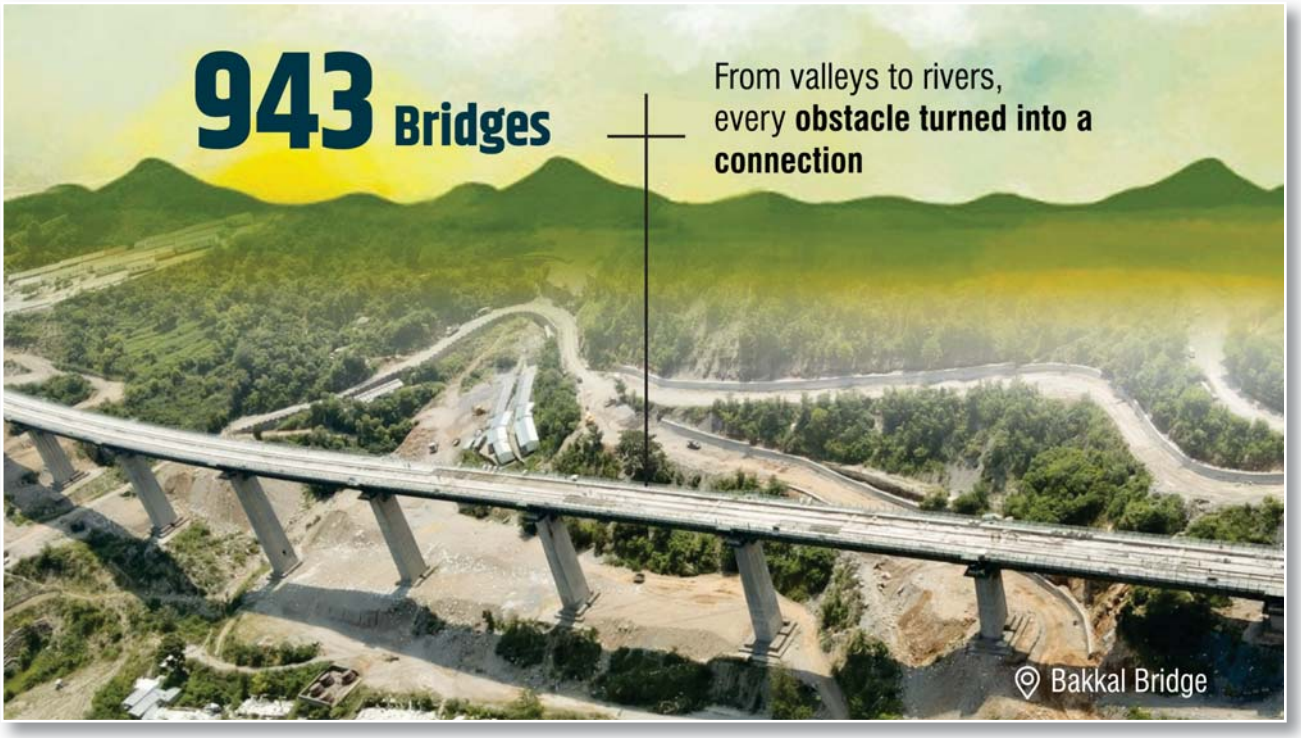
ii. Industrial Development: The rail link facilitates the transportation of raw materials and finished goods, encouraging the establishment of new industries, particularly in manufacturing, agriculture and technology sectors. This could lead to the growth of small and medium-sized enterprises (SMEs) in the region.

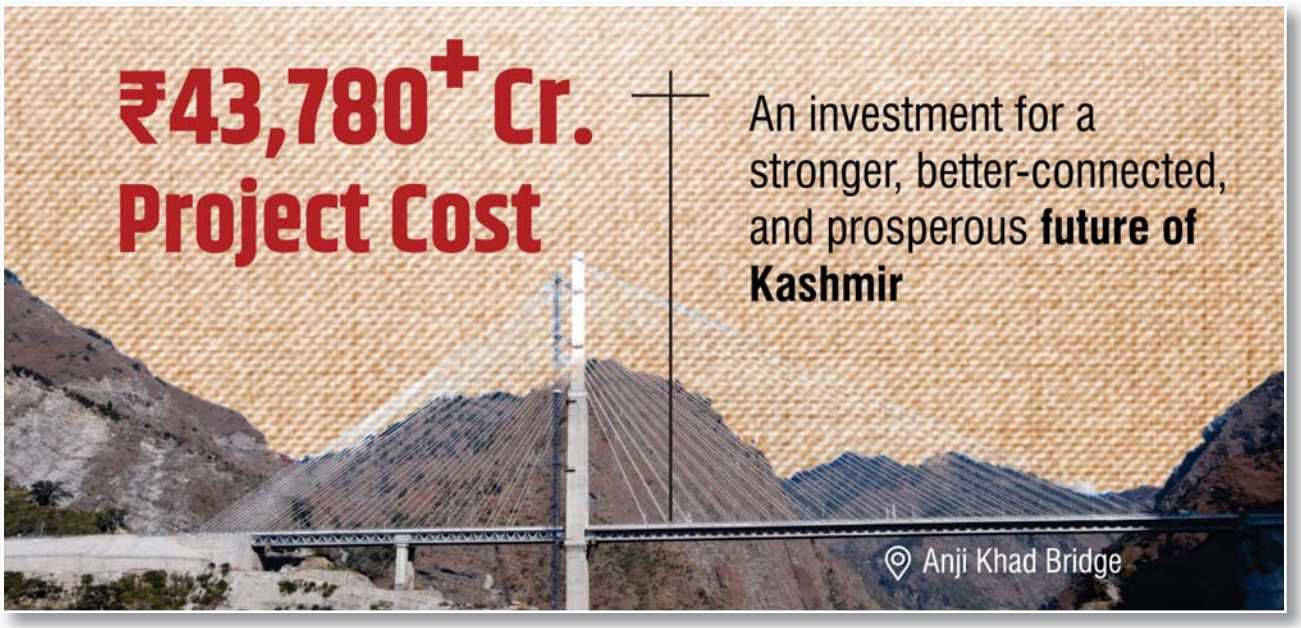
iii. Boost to Agriculture and Trade: The Railway network will help in the smooth transportation of Kashmir's agricultural products like saffron, apples and handicrafts to other regions, boosting trade and exports of agricultural prodects.

iv. Access to National and International Markets: Farmers and local businesses will be able to sell their products beyond the region, giving them access to larger markets and promoting economic diversity in the region.

6. Social Integration and Cohesion: The railway line will connect different communities, promoting social integration and cohesion across regions. People from various parts of Jammu & Kashmir, as well as other states, will be able to interact more frequently, fostering a sense of unity. With improved transportation, cultural exchange will increase, bringing people together to share experiences, traditions and resources, contributing to greater cultural understanding and tolerance.

7. National Security and Strategic Importance: The Railway will also contribute to national security by facilitating quicker mobilization of resources, including military supplies and improving strategic movement within the region. This strengthens the overall security infrastructure and creates a sense of stability,





which is essential for sustained socio-economic development.

8. Environmental Benefits: The introduction of an electrified Railway line reduces dependence on road transport, which is more carbon-intensive. It provides an environment friendly mode of transportation, contributing to a reduction in the region's overall carbon footprint.

The construction of the new railway line in the USBRL project will significantly impact the socio-economic development of Jammu & Kashmir. It will improve infrastructure, generate employment, boost trade and enhance connectivity, leading to long-term economic prosperity. Additionally, it will contribute to greater social integration, better access to essential services and overall improved living standards for the people of the region. This multi-faceted development ensures that the USBRL project plays a crucial role in transforming the socio-economic landscape of Jammu & Kashmir.

Challenges faced and Lessons Learnt

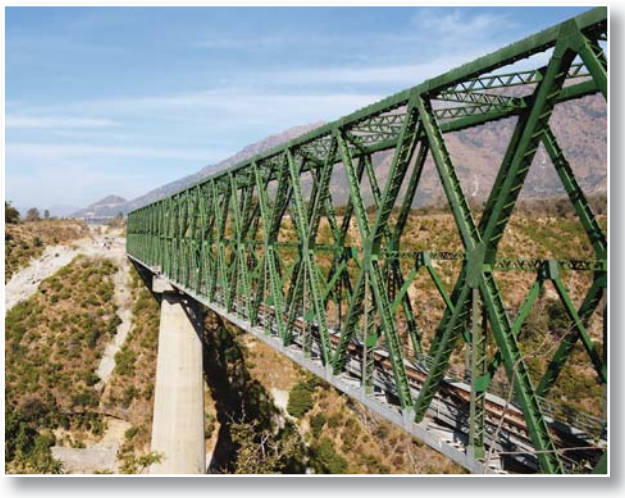
A. Geological challenges:

From Katra to Banihal, the Railway alignment traverses through young Himalayas, which are tectonically active and dotted with many thrusts and faults. Main Boundary Thrust (MBT)/Reasi thrust and Panjal thrust are the major thrust zones and many other local shear zones, through which the alignment passes. The stretch of 111 km involves, 164 km of tunnelling (involving main and escape tunnels), role of geology and topography becomes important. Himalayas being youngest mountains, offer surprises and challenges every few meters due to frequently changing geology, making tunnelling a challenging task. There are 37 bridges (7 km), which includes world's highest railway bridge (1315 km) across river Chenab and Indian Railways' first cable stayed bridge (473 meter) across Anji river and two mega bridges i.e, bridge no. 220 (490 meter) and bridge no. 224 (777 meter). Lots of technical challenges/problems were faced during construction of long tunnels and mega bridges. These issues were aptly tackled as per the advice of various national and international consultants.

B. Challenges faced, solutions adopted and lessons learnt in tunnels

1. Challenges

Tunnelling work on Jammu - Udhampur and Udhampur – Katra sections were carried out using conventional drill and blast method which involved rigid support system and D-shape tunnel profile. Initial tunnelling work on Katra – Banihal section from 2004 to 2009 in Reasi and Sangaldan areas also involved rigid support system with D-shape tunnel profile. There were no dedicated detailed design consultants (DDC). During construction, serious deformations were observed in one of the



tunnels on Udhampur – Katra section and in some tunnels in Katra – Banihal section also.

To tackle this issue, DDCs were appointed 2010 onwards for providing solutions and revised design for construction of tunnels on Katra – Banihal section. After detailed study, DDCs suggested adoption of elliptical/modified horse shoe tunnel profile. Further, it was suggested to adopt state of the art NATM (New Austrian Tunnelling Method) tunnelling philosophy for execution of tunnelling works instead of conventional rigid support system.

2. Summary of challenges faced, solutions adopted and lessons learnt while tunnelling through complex and difficult geology in Katra – Banihal section :

2.1 Challenges/problems faced

i) Survey work to fix the alignment: Due to non accessibility of the project sites, the final location survey work was very critical and challenging for the survey team.

ii) Heavy squeezing of tunnel profile and heaving of tunnel invert.

iii) Tunnel collapses and cavity formations.

iv) Tunnelling through MBT (T-1): Gravity driven failure/loose flow in zones comprising fully saturated, crushed and sheared dolomite mixed with calcite, clay and silt.

v) Complex geology and presence of localized shear zones.

vi) Huge ingress of water requiring continuous heavy dewatering arrangements: Most of the tunnel is in uprising gradient from P1 to P2. Due to reverse gradient from P2 side, multi-stage dewatering using pumps (45) of capacity amounting to 1620 HP was required round the clock. The huge ingress of water (more than 500 litre/sec) and dewatering made excavation most difficult and challenging.

vii) Presence of Methane gas (T-14): Tunnel mining through Subathu Formation (comprising siltstone, shale and coal lenses), was highly challenging, time consuming and difficult task owing to very poor stand-up time and presence of methane gas (CH4 and H2S).

2.2 Solutions adopted

i) Appointment of Detailed Design Consultants (DDCs) for tunnel design and technical guidance during tunnel construction.

ii) Adoption of elliptical/modified horse shoe tunnel profile in place of D-shape as elliptical/modified horse shoe profile is more efficient in disbursal of stresses.

iii) Adoption of state of the art NATM (New Austrian Tunnelling Method) tunnelling philosophy for execution of tunnelling works instead of conventional rigid support system.

iv) Squeezing in D-shaped tunnel: Re-profiling the deformed portions by modifying D-shape to elliptical/modified horse shoe shape profile using NATM philosophy.

v) At locations having large deformations, the re-profiling was done using NATM philosophy with heading and benching sequence.

vi) Application of active pre-excavation measures-pipe roofing (PR) injected by cement/chemical grout.

vii) Controlling the thrust ahead of the face by maintaining a face buttress.

viii) The cavities were successfully tackled and further cavities prevented with the help of technical/expert advice of DDC

ix) An innovative procedure of providing Stress

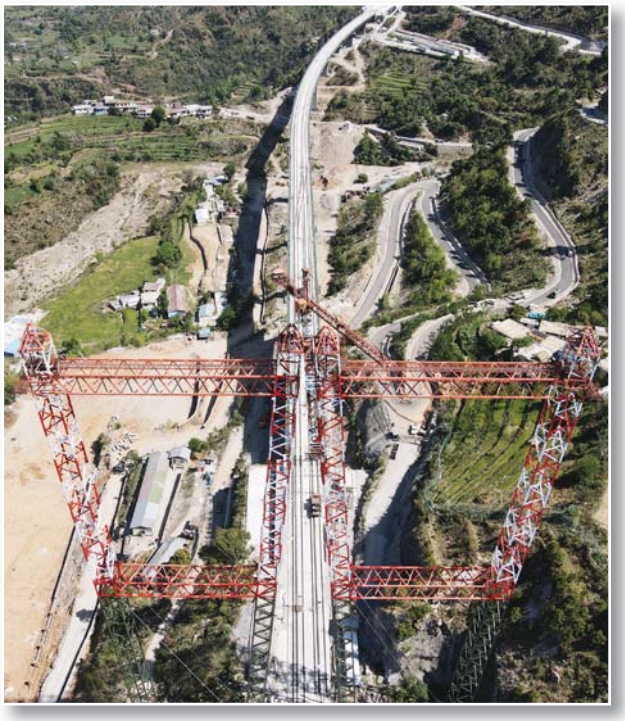
Release Holes (SRH) has been used on USBRL project for the first time. Provision of these SRHs help in preventing cracking of shotcrete/ primary lining in squeezing conditions.

x) Wing Drainage Holes (WDH) were used to divert the ingress of water from face to keep it dry thereby helping in face excavation.

xi) Tackling methane gas and poor strata in Subathu Formation (T-14)

- In order to avoid explosion, fire and toxic effect due to methane gas emission, the welding inside tunnel was strictly prohibited. Exhaust fans capacity was increased and its distance from tunnel face was reduced to flush out methane gas.
- In order to increase progress, ET was advanced ahead of MT, additional faces for MT excavation were created through a cross passage from ET side.
- Stress relieving holes in radial direction were provided for preventing tunnel squeezing.
- Sequential excavation in heading and benching with rigid support system was used.

xii) Tunnel mining in reverse grade creating problem of drainage: Adits can be helpful for facilitating drainage beside having additional faces in case of longer tunnels.



C. Challenges faced, solutions adopted and lessons learnt in Bridges

Challenges faced and solutions adopted

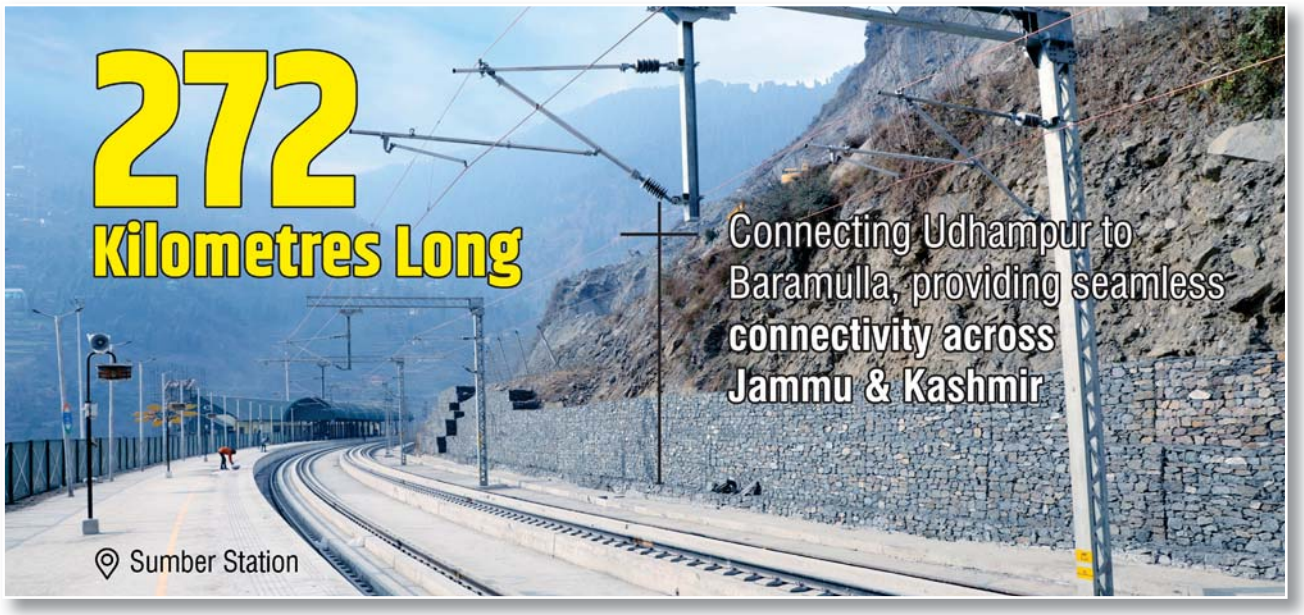
1. Technical Challenges

Many innovative methods/solutions were adopted to overcome the various technical problems/challenges that came up while constructing these Iconic bridges like, hybrid well foundations, use of slip form and jump form shutters, tower cranes, cable cranes, curing compounds, cat oscillator, self compacting concrete, CNC cutting machine, CNC drilling machine, tekla model, mono rail for shifting materials, guide beam for pushing of segment in transition and curve portion, cable anchors, dywidag bars, HSFG bolts, micro piling, etc.

2. Bridge-wise details are as under:

3.1 Chenab Bridge

Challenges	Solutions adopted
Open joint at S60 foundation of Chenab Bridge	Cement consolidation grouting and pre-stressed anchors provided.
Treatment of S50 foundation for open joints	Consolidation grouting along with cable anchoring has been done to strengthen the slope.
Launching of the deck in 2.74 degree curve in viaduct portion	The deck was launched through curve and transition part by providing guide beam.
Erection of arch by cable stays	Temporary piers provided at top of pier P40 and P50. Cables were used to hang the arch. The deflection of steel arch varies during day and evening hour. Based on the temperature data the erection is monitored with designer regularly.
Free flow concrete for arch box	Requirement of design. Each arch chord filling has been done using self-compacting concrete.
Testing of welds	NABL lab was established at site. This helps easy and quickest way for quality assurance, witnessed by CBPU, KRCL, NR IRS and CEIL.



3.2 Anji Bridge

Indian Railways' 'first cable-stayed bridge' is under construction across Anji Khad

The location of Anji bridge is very peculiar and challenging. Over the time, discussions were going on for changing the railway alignment at this location. But the engineers' constant efforts and dedication, arrived at suitable solution and a beautiful cable stayed bridge was conceived.

Various unique techniques and equipment was used like DOKA Jump form shuttering for ease of construction and reducing joints, pumped concreting system to increase efficiency and for saving construction time. State-of-the-art tower crane, make 'COMANSA' (imported from Spain) of 25T capacity with extendable height up to 205 meter was used for the execution of construction work upto height of 193 meter.

Summary of challenges faced and solutions adopted

(i) **Slope Stability:** Based on extensive slope stability analysis, scheme for slope stability measures was finalized by the design consultant. However, the suggested scheme was not feasible at site due to various constraints such as steep, negative slopes, space constraints, unapproachable sites and fractured dolomite rock. In such a situation, the passive anchors as suggested by the consultant could not be installed despite all efforts at site.

Solution adopted: After detailed discussions and deliberations with the design consultant and the executing agency, it was decided to provide cable anchors (active support) in place of solid anchors (passive support) as cable anchors were easy to install in steep and negative hillslopes when compared with solid anchors.

(ii) **MA2 Well foundation:** MA2 foundation involves two well foundations having 112 micro-piles in each well, which was a challenge to execute in the fractured dolomite rock strata. Implementing this scheme would have led to loss of time in completing the main bridge foundation works.

Alternative method was suggested to go for construction of vertical shafts using NATM method in place of micro-piling which was a time-consuming works with no progress. MA2 well foundation has been completed successfully in optimum time using this site-specific solution.

(iii) **Tower Crane:** Erection of tower crane in a constrained space, with difficult approach was a challenge. Tower Crane was placed at a skew angle to the pylon instead of perpendicular, to take care of deep valley on the other side.

(iv) **Formwork:** Initially it was planned to construct the Y shaped pylon using slip form. This was

not feasible due to inclined shaped Y portion. After considering all the constraints and technical issues, it was decided to use mechanically crawling jump form work shuttering for constructing the Y shaped pylon. DOKA jump form shuttering was successfully used to complete the construction of 193 meter high Y shaped main pylon.

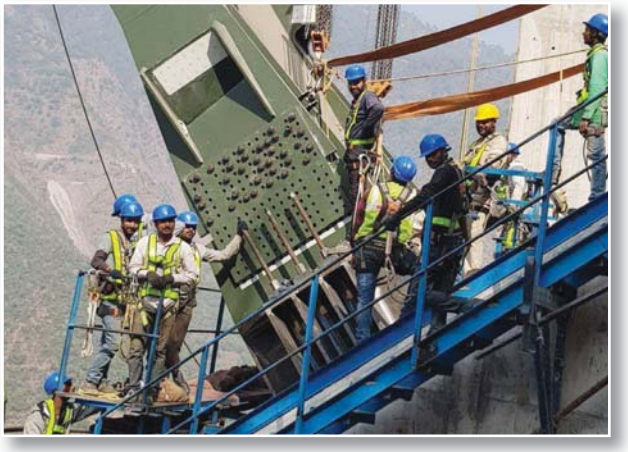
(v) **Concreting of main pylon:** Concreting of main pylon upto deck level i.e. upto 51 meter height was done using heavy duty concrete pumps. Since, it was a challenge to fix the concrete pump in inclined portion for concreting of inverted Y portion, it was decided to use a specially designed compressor-controlled hopper shaped concrete bucket of 3.00 cubic meter capacity, for concreting of inverted Y pylon above deck level.

(vi) **Use of self-compacting concrete (SCC):** The vertical shaft of main pylon (71 meter) is a composite structure having very heavy and congested reinforcement. Normal concrete was not feasible due to constraints in vibrating the concrete. To overcome this problem, Self-Compacting Concrete (SCC) was successfully used in place of normal concrete in this portion as no compaction is required.

(vii) **Fabrication of Main Bridge Segments:** Initially it was planned to fabricate main bridge segments at site workshop. Due to space constraints in developing site fabrication workshop, it was decided by the designer to outsource fabrication work to a RDSO approved vendor's workshop and avoid site welding by providing HSFG bolted joints in place of welded joints. This ensured quality as well as saving of time.

i. **Shifting of pre-assembled girders:** After assembly of girders, its total length was about 17 m and weight was about 170 MT. Shifting preassembled girders with such a large length and weight was a big challenge. It was decided to erect an extra gantry of 80 MT thereby increasing the total capacity of two gantries to 200 MT.

D. Construction of sumber station yard: Situated in geographically remote location on a



treacherous hill slopes in village Sumber in Ramban district. The station building and yard have been constructed in the lap of picturesque Sumber valley. It is a two-line station yard between tunnels T49 and T50 and on bridges 243 and 244. Railway alignment traverses through weak geological formation and proximity to Panjal thrust, due to which following challenges faced during construction:

i. Instable overburden strata, which is a Paleo Land slide stretch.

ii. During construction of yard, heavy displacement/detachment/dislocations up to 4 meter of slope were observed, due to instable strata.

iii. Space constrains, extreme climatic conditions and remote location.

iv. Huge earth work more than 15 lakh cubic meter in excavation and heavy slope stabilization measures.

v. Requirement of deep well foundations for founding the major bridges in Sumber yard on safe competent rocks.

Detailed geotechnical and other relevant studies were conducted to access the cause of displacement and to design safe stabilization measures through competent design consultants of international repute. Following designed stabilization measures were adopted:

i. Continuous study of geodetic monitoring, pluviometry, piezometer and inclinometer data.

ii. Re-profiling of the upper and lower slopes, provides stability in static conditions and limiting displacements under seismic conditions.

iii. Installation of designed support system including, shotcreting, self-drilling anchors, drapery nets, dynamic rock fall barriers, cable anchors etc.

iv. Removal of the collapsed material of the landslide laying on the slope above the future station platform.

v. Stabilization of the lower slope from the station platform to the river with a general slope incline of 20° and a reinforced earth retaining structure along the toe of lower slope.

vi. Removal/securing bigger blocks and protection from residual blocks by relatively light rockfall fence all along the station yard.

vii. Long and efficient drainages, reducing both the pore water pressure acting on the slide surface (uplift) as well as the seepage force in the sliding body (dragging effect).

All these challenges and difficulties were handled professionally and diligently by the USBRL project team. The slope is now stable and trains are under operation since February, 2024.

E. **Construction of approach roads:** Due to very rugged terrain, land acquistion / forest clearance issues, hindrance by locals, shortage of explosives, the construction of approach roads had been a big challenge and a project in itself.

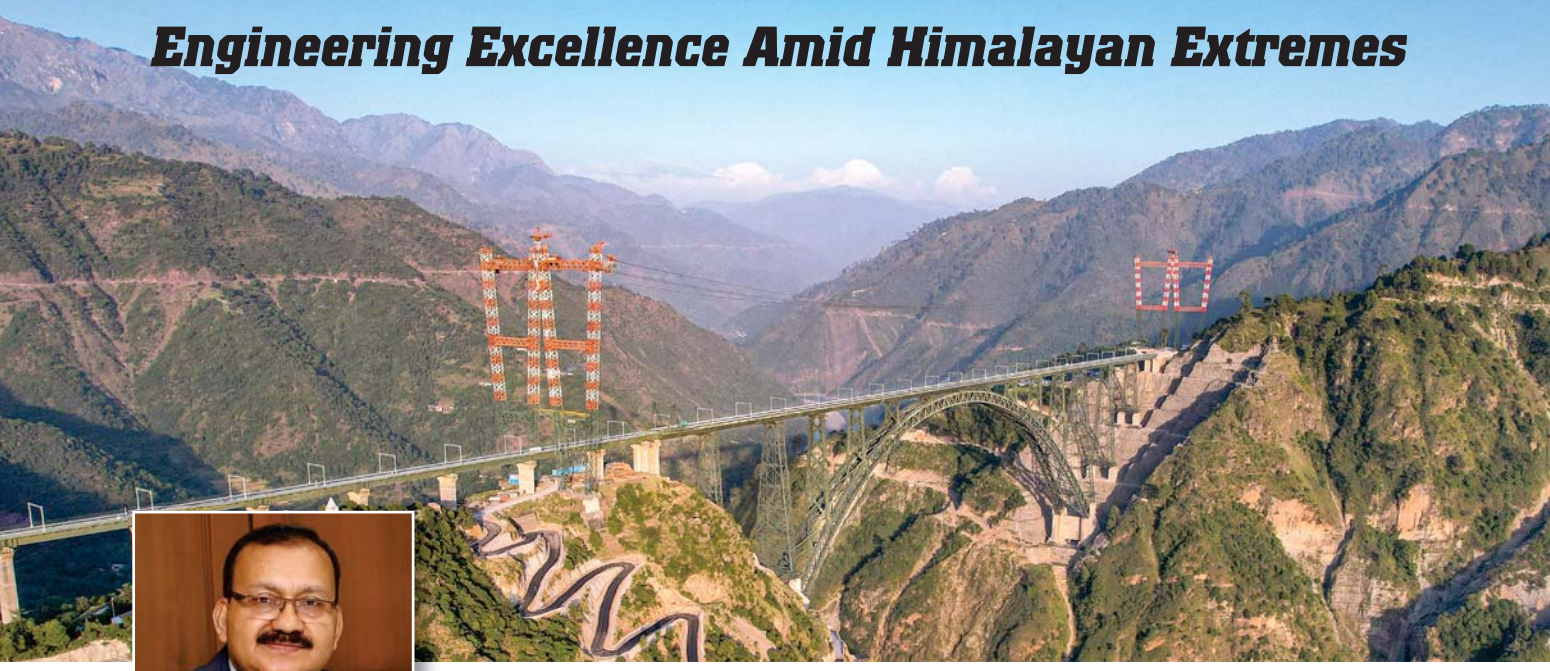
F. **Maintenance of approach roads:** Every year, during monsoons and winter rains, these approach roads get blocked due to frequent landslides and loose boulder falls, leading to delays.

G. **Difficulty in Land acquisition:** Due to hilly terrain/space constraints, locals owning the land were not willing to let their land to be acquired as they were dependent on farming only, with no other source of living.

H. **Law and order issues:** Earlier a lot of law and order issues and hindrances were created by locals. Tunnel and bridge works were stalled for many days due to local hindrances particularly in Sangaldan and Banihal areas. Close liaison were made with J&K administration at various levels for resolving the issues of locals.

Udhampur-Srinagar-Baramulla Rail Link

Engineering Excellence Amid Himalayan Extremes



Santosh Kumar Jha
Chairman & Managing Director
Konkan Railway Corporation Limited

The Udhampur – Srinagar - Baramulla Rail Link Project was the most challenging Project being undertaken post-independence. It was highly essential to provide an alternative and a reliable transportation system to Jammu & Kashmir to join Kashmir valley to the Indian Railways network. In view of importance of this project in providing seamless and hassle free connectivity in the State of Jammu & Kashmir, the Project was declared as 'National Project' in 2002.

A part of this project from Katra - Dharam from 30 km to 72.390 km and 91 km to 101.635 km had been assigned (total of 52.20 km) to Konkan Railway for execution. It comprises 44.59 km i.e. 85.5% of the route in tunnels, 4.6 km i.e. 8.8% of the route on bridges and the balance 5.7% of route in cuttings and embankments. In addition, Konkan Railway constructed 172 km of project roads including a road tunnel of 404 meter length, a 138 meter long bridge across the mighty Chenab Valley and many temporary Bailey bridges to gain access to the Katra - Dharam section.

The alignment of this project passes through three major geological thrust zones namely Reasi thrust, Muree thrust and Pir Panjal thrust. The geological strata vary from loose conglomerate, clay, silt stones, crushed and faulted sand stones and dolomites. Geology changes very frequently due to natural challenges which includes major earthquake zones, extreme temperatures and inhospitable terrain which made it very difficult to access the complete geology in advance.

Considering the varying geological conditions, adjustments in design were needed to be made as the work progressed. Construction of longer tunnels with wider cross-section for station yards was a difficult task for which proper methodologies were being roped in with requisite machinery. Extensive engineering works were required to be done for tunnel portals, deep cuttings, bridges and approach roads.

Socio-economic impact of the Project

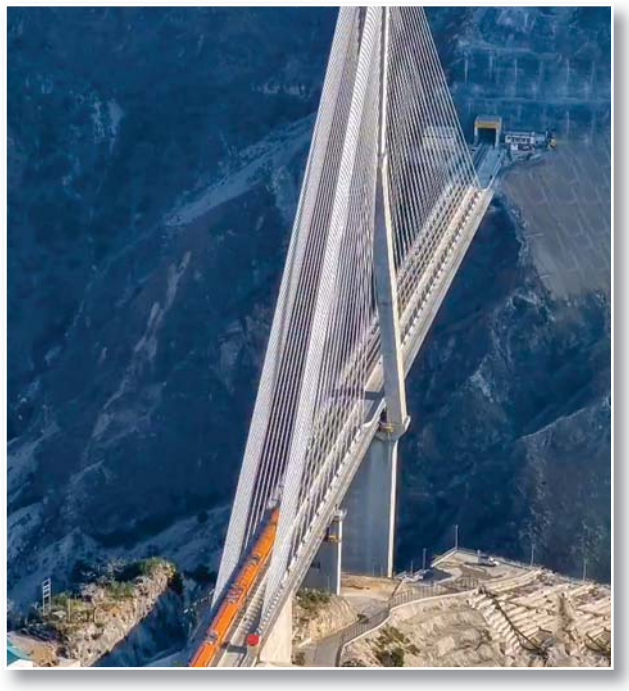
- **Boost to tourism:** Tourists can travel all over the country to visit various parts of J&K specially the valley.
- Better facilities for students of J&K to travel to other parts of the country for educational purposes.
- The completion of this project will provide an all-weather and reliable connectivity to the J&K State with rest of the country by the railway network, also provide connectivity by rail to far flung areas of J&K which will result in overall economic development of the state.
- **Construction of Access Roads:** About 172 km approach roads to work sites have been constructed, these roads will provide connectivity to far-flung villages and connect them to the main stream.

Tunnelling

There are 16 main tunnels with aggregating length of 44.59 km. In addition, about 25.12 km length of tunnelling also done for rescue/safety tunnels, cross passages and adits. The longest tunnel is tunnel No. 42 of 9.274 km length. Four tunnels i.e. tunnel No. 34, 36, 42 and 43 are provided with a separate access and rescue tunnel with smaller size of cross – section parallel to main tunnel. The tunnels on this project are constructed using the state-of-art-technology of New Austrian Tunnelling Method (NATM)) and conventional method.

Bridges

Chenab Bridge: The project alignment crosses deep gorge of Chenab river near Salal Hydro Power Dam, which necessitated construction of a mega bridge across river Chenab. Chenab Bridge, at 359 meter above river bed and having 467 meter of single arch span across mighty Chenab



river is the highest railway arch bridge in the world. This iconic bridge soaring 359 meter above the bed of the river Chenab is 35 meter higher than the iconic Eiffel Tower in Paris.

The overall length of Chenab bridge is 1315 meters having 17 spans, in which one span of main arch portion across Chenab river is of 467 meters length. The viaduct portion comprises straight and curved portion. The curvilinear portion of viaduct is located on the sharp curve of 2.74 degree. The curved portion of viaduct portion has been launched by end-on launching using launching nose. This is the first time in India that this technique has been successfully carried out on Curve and USBRL team need special commendation for having successfully executed the work. Fabrication work of the super structure of this viaduct was carried out by installing and commissioning of an extremely efficient and technically superior workshop at the site.

The erection of Arch is carried out from both ends with the help of Cable Crane. It consists of 2 arches (one upstream and other downstream) joined by wind bracings together parabolic in shape having crown at 359 meter height from river bed making it the World's Highest Railway Arch Bridge. State-of-the-art technology is used to control the geometry of the Arch.

Unique Features of Chenab Bridge

1. Highest railway arch bridge in the world at 359 meter.

2. Cable crane assembly including Pylons with a span of 915 meter is the longest in the world. Pylon at height of 127 meter is higher than Qutub Minar by 72 meter.

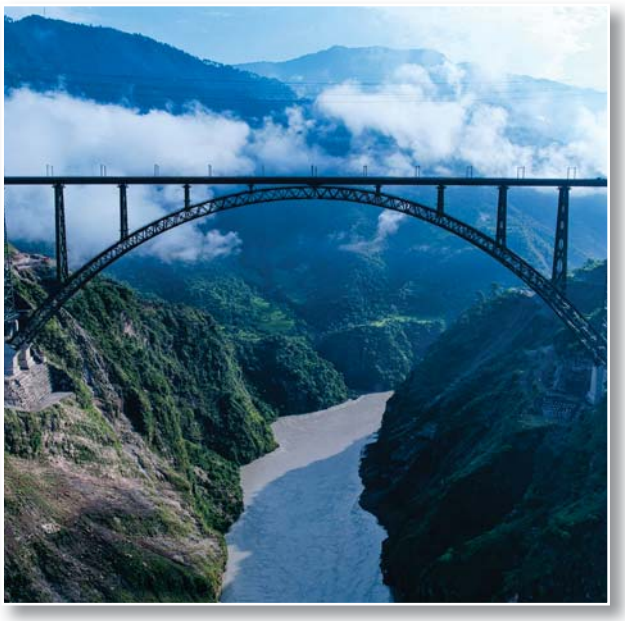
3. First time in the globe, the bridge has been designed for blast load in consultation with DRDO.

- Redundancy kept in design.
- Removal of one pier/trestle.
- Bridge shall not collapse and remains operational at 30 kmph.
- Bridge remains repairable.

4. For the first time in country, launching of plate girder by pushing from one end of curve of 2.74 degrees has been successfully completed (overall length of curvilinear portion is 268 meter).

5. First time in Indian Railways, use of Phased Array Ultrasonic Testing machine for inspection of welds in bridges in India.

6. Chenab bridge site lab has been accredited by NABL (National Accreditation Board for Laboratories) for testing of welded elements for first time on Indian Railways.



7. Highest structural steel pier at 130.855 meter at S-40 foundation, which is higher than Qutub Minar by 72 meter.

B) **Anji Bridge:** The Anji Khad bridge is a asymmetrical cable stayed bridge which connect Katra and Reasi Section of Udhampur-Srinagar-Baramulla Rail Link Project. This is the first cable stayed bridge constructed in Indian Railways. The Anji Bridge mainly includes the main bridge having length of 473.25 meter, the ancillary viaduct having length of 120 meter and the central embankment (between main bridge and ancillary viaduct) having a length of 64.25 meter. The specific feature of the bridge is its main span having length of 290 meter and height (193 meter) above top of Well Cap. The single Pylon (inverted Y shape) is 193 meter high above Well Cap and 331 meter high above river bed. The bridge is supported by total 96 cables and single Pylon of 193 meter height placed on Reasi end. The bridge is designed by M/s Italfer SPA, an Italian consultant.

The Bridge has integrated monitoring system by means of numerous sensors installed at specified locations for recording various critical parameters on real time basis to monitor the structural health of the bridge.

To move heavy materials, KRCL had constructed a 138 meter long road bridge over river Chenab near Dhamkund on Ramban - Gool State highway. This road bridge is connecting surrounding villages i.e. Sangaldan, Gool, Mahore, Arnas, Kanthan and Reasi in Jammu & Kashmir. Also, to increase the progress of approach road work and have additional work fronts, more than 260 MT machineries like excavators, twin drilling jumbo, road roller, dozers, dumpers, shotcrete machines, concrete mixers, generators etc., were shifted using world's largest cargo Helicopters MI 26 from Indian Air Force in 21 sorties. The required Helipad at Surukote village was constructed manually using hand tools as there was no other access for the vehicles.

Konkan Railway always remains committed to contributing to the growth and development of the nation.

USBRL: Kashmir's

Jaya Varma Sinha
Former Chairman & CEO,
Railway Board

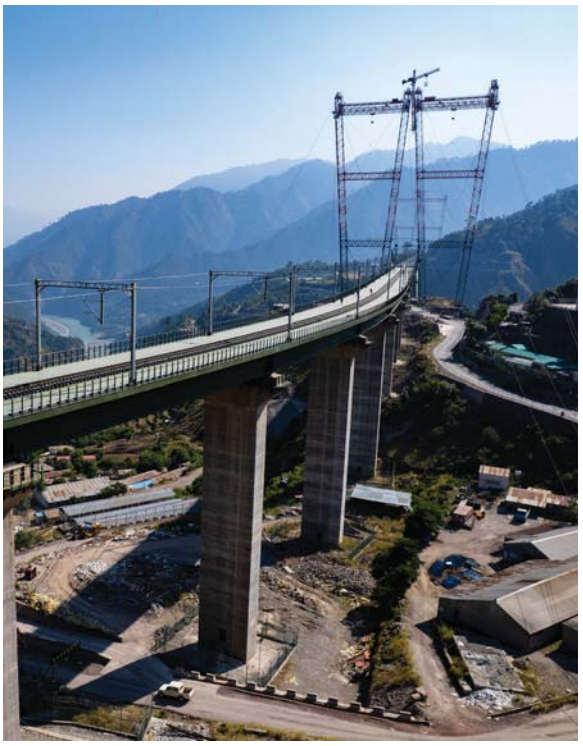
As the country awaits the most ambitious rail project of India which is 272 km long stretching from Udhampur to Baramulla, the journey promises to be more than just a passage. The route traverses some of the most picturesque and challenging geographies in the world. Recognised as a highly complex construction project, the USBRL comes at an estimated cost of more than ₹42,000 crore, with ballast-less tracks laid over bridges and tunnels, spanning deep gorges and piercing the heart of mighty mountains. More than 90 percent of the route is traversed over 943 bridges and 36 main tunnels, including India's longest railway tunnel, the T-50, stretching for more than 12.7 kilometers. On the Katra - Banihal section of USBRL, lies the Anji Khad Bridge, the country's first cable-stayed rail bridge. The 725 meter long bridge, built with the support of 96 cables, stands 331 meters above mean sea level and is a masterclass in design and engineering. Beyond the engineering marvel, the rail link also promises to boost tourism and all weather connectivity in the region, potentially transforming the socio-economic landscape of Jammu & Kashmir.

The project is home to several railway stations that are key to the progress, security and prosperity of Jammu & Kashmir. Qazigund, known as the 'gateway of Kashmir,' serves as a vital connection between South Kashmir and the rest of the region. Stations like Pampore, Srinagar, Sopore and Anantnag are central to the valley's economic activity, serving as major business hubs. Additionally, the significance of Reasi and Katra stations lies in their proximity to the renowned Mata Vaishno Devi temple, making them crucial for both spiritual and economic growth.

Dream Fulfilled

The state-of-the-art Vande Bharat Express has been tailored to specifically operate in the region's challenging winter conditions with a view to ensuring reliability, safety and comfort. Apart from its modern amenities, the Kashmir version of Vande Bharat is equipped with climate-specific adaptations to provide world-class travel experience. Its Advanced Heating Systems promise smooth operations even in sub-zero temperatures. The driver's front lookout glass has also been embedded with heating elements for defrosting, ensuring clear visibility even in harsh winter conditions.

Pir Panjal, the sentinel of Kashmir valley, awaits the reassuring rhythm of train wheels chugging through the Banihal Tunnel, bringing alive in their wake, our long cherished dream of seamless connectivity. From 'Kashmir to Kanniyakumari', India has always been one. The newest rail link only deepens that centuries old connection, with the added promise of making Kashmir accessible to all!



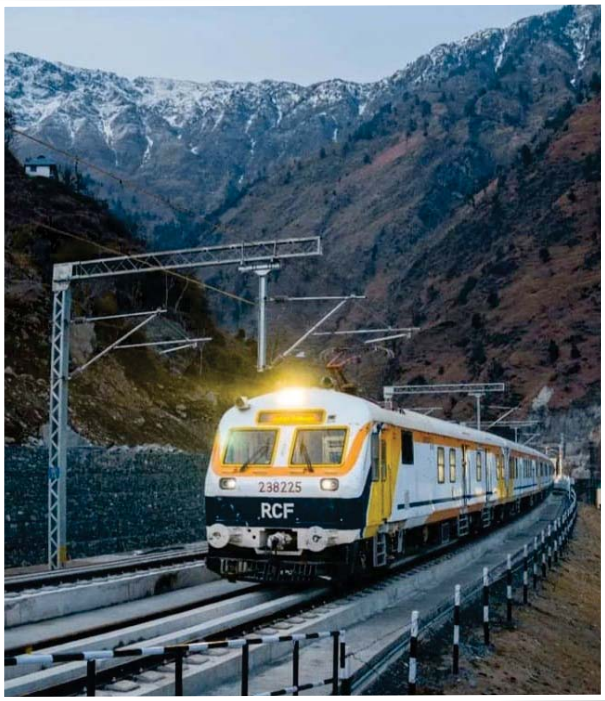
The Rail Revolution in Kashmir

USBRL and the Promise of Progress

Ravi Kant
Senior Journalist

The Udhampur-Srinagar-Baramulla Rail Link (USBRL) project stands as a monumental endeavour in India's infrastructure landscape, poised to transform the socio-economic fabric of Jammu & Kashmir. This ambitious and transformative milestone railway project, spanning 272 km through the challenging Himalayan terrain, is not merely a feat of engineering but a symbol of connectivity, progress and unity. Narendra Modi, Prime Minister and Ashwini Vaishnaw, Minister of Railways have repeatedly emphasized its significance, articulating a vision where the USBRL serves as a catalyst for the region's development. Their words reflect optimism, determination and a commitment to integrating Jammu & Kashmir more seamlessly with the rest of India, fostering economic growth, tourism and social cohesion.

The USBRL project, initiated in 1994-95 and declared a national project in 2002, has overcome formidable geological, topographical and meteorological challenges to near completion. With 255 km of the rail link operational by late 2024, the project is on the cusp of realizing a decades-long dream of connecting Kashmir to the national railway network. Narender Modi, Prime Minister has described this achievement as a



cornerstone of India's collective progress, stating, 'Today, our Jammu & Kashmir is setting new records in rail infrastructure. The Udhampur-Srinagar-Baramulla Rail Link (USBRL) project is being talked about across the nation.' This quote underscores the project's prominence not only as a regional milestone but as a national triumph, highlighting its role in elevating Jammu & Kashmir's stature in India's development narrative.

Boosting the Local Economy Through Connectivity

The USBRL project is expected to reshape the economic landscape of Jammu & Kashmir by enhancing connectivity and creating new opportunities. PM has articulated this transformative potential, noting, 'This project will give impetus to the economy in the region.' The rail link will drastically reduce travel time between Jammu and Srinagar to approximately three to three-and-a-half hours, compared to the five to six hours by road, making it a reliable all-weather alternative to the often-disrupted Jammu-Srinagar highway. This improved accessibility is anticipated to boost trade, particularly for Kashmir's signature products like apples, dry fruits, pashmina shawls and handicrafts, which can now reach broader markets more efficiently.

However, logistical challenges, particularly during harsh winters, have long hindered the ability of local producers to access broader markets. The USBRL project addresses this by providing an all-weather rail link, reducing travel time between Jammu and Srinagar to approximately three hours and ensuring year-round connectivity. The establishment of four cargo terminals between Banihal and Baramulla will enable farmers and artisans to transport their goods more efficiently and cost-effectively, expanding their reach to markets in Delhi, Mumbai and beyond.

Creating Employment Opportunities

Moreover, the construction and operational phases of the USBRL project have already generated significant employment opportunities for the local population. From skilled engineers to labourers, thousands of residents have found work in building the railway's tunnels, bridges and tracks. The iconic Chenab Bridge and Anji Khad Bridge, engineering marvels of the project, stand as testaments to the contributions of local workers who have toiled in challenging conditions. The creation of the Jammu Railway Division, inaugurated in January 2025, further prioritizes local recruitment, ensuring that operational roles such as station staff, maintenance crews and administrative positions are filled by residents of Jammu & Kashmir.

Opportunities have Historically been Limited

Ashwini Vaishnaw, Minister of Railways has echoed this sentiment, emphasizing the project's role as an economic engine. He has stated, 'The USBRL project will be a milestone in improving the economic landscape of J&K'. Vaishnaw's vision extends beyond mere connectivity, focusing on the creation of employment avenues and the stimulation of local industries. The completion of iconic structures like the Chenab Bridge—the world's highest railway arch bridge—and the Anji Khad Bridge, India's first cable-stayed rail bridge, exemplifies the project's engineering prowess and its potential to draw global attention. Vaishnaw has highlighted the strategic importance of these milestones, noting, 'Historic milestone; Final track work on the Udhampur-Srinagar-Baramulla Rail link is complete.' These engineering marvels not only facilitate connectivity but also position

Jammu & Kashmir as a hub for innovation and infrastructure excellence.

Revolutionising Tourism For Local Prosperity

The USBRL project also promises to revolutionize tourism, a vital source of income for many local communities. Jammu & Kashmir's breathtaking landscapes, from the snow-capped peaks of the Pir Panjal to the serene valleys of Kashmir, attract millions of tourists annually. The rail link opens up previously inaccessible regions, such as the Gool Valley and the hot water springs near Sangaldan, to visitors, creating new avenues for local entrepreneurs. Homestays, small eateries and guided tours are likely to flourish as tourists explore these areas, directly benefiting families in remote villages. For instance, communities along the Reasi-Baramulla section can now offer unique cultural experiences, showcasing Kashmiri hospitality and traditions. This tourism boom will generate income for local guides, drivers and small business owners, fostering grassroots economic growth. Tourism, a vital pillar of Jammu & Kashmir's economy, stands to gain immensely from the USBRL project. Prime Minister has envisioned a broader connectivity framework, stating, 'In upcoming days, Kanyakumari to Kashmir will be connected with railways and the dream of people of Jammu & Kashmir will become a reality.'

Enhancing Access To Essential Services

Beyond economic benefits, the USBRL project significantly improves access to essential services, enhancing the quality of life for local residents. In a region where road connectivity is frequently disrupted by landslides, snowfall and heavy rains, the railway offers a reliable alternative for travel. This is particularly critical for students, patients

and professionals who require access to educational institutions, healthcare facilities and workplaces outside their immediate areas. The rail link also facilitates the transport of essential goods, such as medicines and food supplies, ensuring that rural communities are not cut off during adverse weather. By providing consistent access to these services, the USBRL project empowers local people to pursue better opportunities and lead healthier and more connected lives.

Fostering Social Integration

Social integration is another profound benefit of the USBRL project for the people of Jammu & Kashmir. The region's geographical isolation has often created a sense of disconnection from the rest of India, exacerbating challenges of identity and belonging. The railway bridges this gap, both physically and psychologically, by linking remote villages with urban centers and the national mainstream. Families in far-flung areas like Sangaldan or Kulgam can now visit relatives in Jammu or travel to other parts of India more easily, fostering stronger interpersonal ties. This connectivity also encourages cultural exchange, as locals interact with travellers from diverse backgrounds, showcasing Jammu & Kashmir's rich heritage while embracing new ideas. For the youth, in particular, the rail link opens up opportunities to explore educational and career prospects beyond the region, empowering them to contribute to both local and national development.

Strengthening Regional Connectivity

The USBRL project also holds strategic importance for local communities by enhancing regional connectivity. By linking Jammu & Kashmir with

neighbouring states like Himachal Pradesh, Punjab and Ladakh, the railway creates a network that amplifies opportunities for trade, education and collaboration. For instance, students from rural areas can access universities in Punjab, while small businesses can tap into markets in Himachal Pradesh. This interconnectedness strengthens the region's socio-economic fabric, ensuring that development is inclusive and far-reaching. Additionally, the project's focus on safety and sustainability, with features like ballastless tracks and extensive tunnelling, ensures that local communities benefit from modern infrastructure without compromising their natural environment.

The International Strategic Importance of the USBRL Project for India's Security

The USBRL project is a strategic game-changer for India's security, with far-reaching international implications. By enhancing military mobility, countering external threats, promoting regional stability and bolstering geopolitical influence, the railway strengthens India's defense architecture in a volatile region. It transforms Jammu & Kashmir from a logistical challenge into a strategic asset, enabling India to project power, assert sovereignty and foster development as a bulwark against instability. As the rail link becomes fully operational, with Vande Bharat trains connecting Srinagar to Delhi, it will not only unite India's heartland with its frontier but also cement India's standing as a formidable power capable of securing its interests against complex geopolitical challenges. The USBRL is thus not just a railway

but a lifeline for India's security and strategic ambitions on the global stage.

A New Dawn For Local Communities

The USBRL project is a beacon of hope for the people of Jammu & Kashmir, offering a new direction for their development through tangible benefits and inclusive growth. By unlocking economic opportunities in agriculture, handicrafts and tourism, creating jobs and improving access to education and healthcare, the railway empowers local communities to thrive. Its role in fostering social integration and regional connectivity further amplifies its impact, ensuring that even the most remote villages are part of India's progress. As the USBRL project nears completion, it stands as a testament to the resilience and aspirations of Jammu & Kashmir's people, paving the way for a future where they are not just connected but truly empowered to shape their own destiny.

Ashwini Vaishnaw, Minister of Railways conducted trolly inspection of the Chenab Bridge on 26th March, 2025

Railway Projects of Jammu & Kashmir,

Ladakh to Enhance Indian Strategic Strength

Sachin Budhauliya
Senior Journalist

Rail projects in Jammu & Kashmir and Ladakh are not only essential for regional socio-economic development but are also very important for India's strategic interests. With the completion of Udhampur-Srinagar-Baramulla Rail (USBRL) link, the rest of India's rail connectivity to the Kashmir Valley is open now. Tourists, traders, local residents, students etc. will have cheap and convenient mode of transport. The movement of goods will also be possible in a shorter possible time. At the same time, the rail connectivity, in both the Union Territories surrounded by enemies on three sides, will ensure speedy, safe and sustainable movement of defence logistics and troops movement. With the creation of separate railway division of Jammu, these development projects will be further accelerated.

After the Udhampur-Srinagar-Baramulla rail link (USBRL), the Ministry of Railways is preparing to start work on five more railway projects. The survey was conducted for a new railway line between Jammu and Poonch through Akhnoor and Rajouri (223 km) at an estimated cost of ₹22,771 crore.

Work on the Srinagar-Kargil-Leh rail scheme had also started but due to low traffic estimates in the feasibility report, the project has not been able to proceed. This project has been postponed due to high cost and low demand and the Jammu-Poonch line has also been halted due to feasibility concerns.

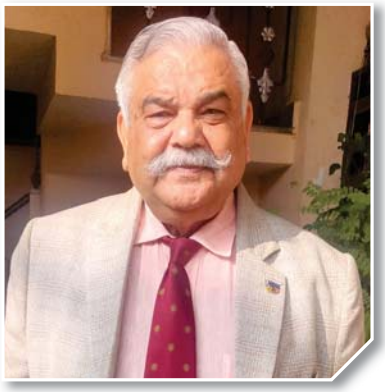
Meanwhile, the Railways has conducted surveys on five new railway links, including Baramulla-Uri new line (46 km), Sopore-Kupwara new line (37 km), Anantnag-Pahalgam new line (78 km), Awantipur-Shopian new line (28 km) and Banihal-Baramulla doubling (118 km).

The Bilaspur-Manali-Leh railway line has been identified as the strategic importance line by the Ministry of Defence. The survey for this project of about 489 km has been completed and Detailed Project Report (DPR) has been prepared. The estimated cost of the project is ₹1,31,000.

According to defence analysts, rail projects in Jammu & Kashmir and Ladakh will enhance

India's strategic strength. The easy and rapid transportation of engineering equipment like tanks, heavy weapons, ammunition, cranes etc. will significantly enhance the combat capability of the armed forces. Roads and other infrastructure development will also be accelerated.

Senior Army officials said the opening of the rail link in Kashmir will provide an alternative line of communication for the Army and other security forces. In unusual circumstances, railways are the best means of transport. Rail transport is fast, cheap and easy. Rail logistics supply will be easier if the road is disrupted due to agitation, landslides, heavy snowfall. According to military officials, the five new projects that have started after the Udhampur-Srinagar-Baramulla rail link are also strategically important. The linking of border areas from Jammu to Nowshera, Mendhar, Poonch, Rajouri, Uri, Kupwara will also strengthen India's frontline security.



Brigadier Anil Gupta
Retired

Retired Brigadier Anil Gupta, who was the commander of the Army's 21st sub-area, who was responsible for supply in the Ladakh region, said the supply line in Jammu & Kashmir and Ladakh was the road. In winters, every year there has been a huge problem in maintaining supplies. If the road is closed due to landslides, snowfall or any natural disaster, there is a huge crisis. A lot of efforts of the army is spent on keeping the supply line running. In Army, the summer season is for trainings or practices. But in the Jammu & Kashmir and Ladakh sectors, logistics supplies in high altitude areas for winters, is the biggest priority, which often forces compromising the training and practice schedule.

Brigadier Gupta said supply of ration and fuel during peacetime and supply of arms and ammunition during wartime are important. It takes a lot of time to go by road. The affordable

capacity of roads is also low. There is also a problem in the deployment of jawans. The jawans need to travel for three days to reach forward posts from the base stations.

Brigadier Gupta said the opening of the railway line would facilitate logistics supply and movement of jawans for 12 months of the year and in case of war, quick logistics supply would also enhance the combative capabilities of the forces. Direct connectivity to forward lines will also be maintained during winter. He said that in 1947-48, the railway line was up to Pathankot, so the Army's maintenance depot was in Pathankot. After the Indo-Pakistan war of 1965, the work of laying the railway line to Jammu started and in 1971 Jammu was connected to the railway network. The maintenance depot then came to Jammu. Now that direct rail connectivity to Baramulla is opening, this has paved the way of opening the Army's maintenance depot in Baramulla and this will make it possible to reach the forward line in a very short time.

Talking about the comparison of cross-border enemy preparedness with railway links in Jammu & Kashmir and Ladakh, Brigadier Gupta said China's connectivity preparedness is better than ours. China is laying railway lines from Lhasa and Shigatse to Ladakh border. "With our railway line being built, we will be able to match it." As far as Pakistan is concerned, it benefits from the fact that the hilly region towards it is not as inaccessible as it is in Indian territory. The construction of the railway line will increase our influence and India's logistics supply line will be more efficient than Pakistan's supply line.

Jammu's New Railway Division

Driving Growth in Kashmir Valley

Arvind Singh
Senior Journalist

The highly ambitious Kashmir Rail Line (Udhampur Srinagar Baramulla Rail Line) will not only connect the Kashmir Valley to the mainline network of the Indian Railways, but also promises to usher in a process of socio-economic development of the region. In order to provide for efficient and safe train operations on the 272 km rail line, a new Divisional headquarters of the Indian Railways has been set up at Jammu. In the initial stages, officials from the Northern Zone of the Indian Railways have been posted on deputation to work in the Jammu division. Subsequently, large scale recruitments will be conducted through the Railway Recruitment Board examinations to work in the commercial, parcel or safety related jobs. The Government is likely to employ youth from Jammu & Kashmir for such jobs, in line with the policy to provide Government jobs to locals.

Official documents indicate that the Government plans include the setting up of a new coaching depot between Jammu and Srinagar, besides a new Gati Shakti Cargo terminal, a goods shed, a new siding and a mechanical laundry facility. The maintenance of locomotives and engines will be done at the locomotives sheds. This will ensure the timely arrival of passenger trains at originating stations, while ensuring their punctuality as well. The Gati Shakti cargo terminals will facilitate the safe and fast transportation of items including foodgrains, vegetables, fruits, onions and salt to the Kashmir valley. In this way, the rail infrastructure will help ramp up business opportunities in the region.

The Railway Board has formulated a new master plan for Jammu to ensure the deployment of all

Narendra Modi, Prime Minister inaugurated the new Jammu Railway Division and laid the foundation stone for Rayagada Railway Division Building and inaugurated the Charlapalli New Terminal Station in Telangana on 6th January, 2025. Ashwini Vaishnaw, Minister of Railways participated in the function from Rail Bhawan through video conference

> As the railway network expands, new headquarters and divisions are being established accordingly. The Jammu division will benefit not only Jammu & Kashmir but also several cities in Himachal Pradesh and Punjab. Additionally, it will provide greater convenience to the people of Leh-Ladakh.
>
> Jammu & Kashmir is achieving remarkable milestones in rail infrastructure. The Udhampur-Srinagar-Baramulla rail line is being widely discussed across the country. This project will significantly enhance Jammu & Kashmir's connectivity with the rest of India. As part of this initiative, the world's tallest railway arch bridge, the Chenab Bridge, has been completed. Moreover, the Anji Khad Bridge, Bharat's first cable-stayed rail bridge, is also a part of this project. Both of these are unparalleled feats of engineering, poised to bring economic progress and prosperity to the region.
>
> **- Narendra Modi**
> **Prime Minister**

NEW JAMMU RAILWAY DIVISION

Sections Covered

- ☑ Pathankot-Jammu-Udhampur (now Martyr Captain Tushar Mahajan) -Srinagar-Baramula (423 Rkm)
- ☑ Bhogpur Sirwal-Pathankot (87.21 RKM)
- ☑ Batala (Excluding)-Pathankot (68.17 Rkm)
- ☑ Pathankot-Joginder Nagar (NG section) (163.72 Rkm)

Total Route KM **742.10 RKM**

Benefits

Connect Jammu & Kashmir to the rest of India, the USBRL project stands as a national milestone

Cover Chenab Bridge (world's highest railway arch bridge) and Anji Khad Bridge (Country's 1st cable-stayed Rail bridge)

Foster job opportunities for locals

Drive socio-economic advancement of the region

Aid boost in tourism in Jammu & Kashmir

Benefitting States/UTs with Cities

Jammu & Kashmir (Jammu City, Srinagar, Katra, Udhampur, Kathua, Rajouri & Poonch, Anantnag, Shopian, Pulwama and Kupwara), Himachal Pradesh (Chamba, Dharamshala, Kangra, Mandi), Punjab (Pathankot), Union Territory of Ladakh

categories of functionaries to ensure smooth train operations between Jammu and Baramulla. Civil, Electrical, Mechanical and Signal Engineers will be posted apart from technicians, supervisors and Grade-4 employees including Helpers and Gangmen. These employees - approximately 2000 in number - will be inducted in a phase-wise manner. Besides, additional rail infrastructure activities have been planned with the idea of fast-tracking the economic activities in the region. This will ensure the transportation of foodgrains and edible items including vegetable oils to the Kashmir valley from other parts of the country. Three Gati Shakti Cargo terminals are proposed to be set up at locations including Samba, Kathunangal and Chann Aroreal. Goods trains will have scheduled halts at these locations and facilities for loading and unloading will be provided. Goods sheds are proposed to be established at locations including Anantnag, Sopore, Pampor and Badham in the Kashmir valley. Parcel offices are proposed to come up at Baltal and Anantnag, among other stations. Besides, sidings for loading and unloading of goods will come up at appropriate locations. Construction of 2000 houses for rail personnel and those of the RPF are also planned.

The Jammu Division will have administrative control over 733.109 km of tracks. Besides the USBRL, the division will control certain rail links in Himachal Pradesh. Currently, these areas fall under the administrative control of the Ferozpur division of the Northern Railway Zone. The Jammu Division will control the operations of 55 Mail and Express trains including two Vande Bharat trains. 11 passenger trains (for daily passengers) will also be run. The Indian Railways also plans to operate a train with Vistadome coaches to enable passengers to savour Kashmir's natural beauty and the ride over the World's tallest rail bridge over River Chenab. The Vistadome coaches are fitted with wide transparent glass windows and a substantial portion of the roof is also affixed with the same material. These coaches enable passengers to take a 360 degree view of the natural beauty that abounds the region. Such trains, apparently enough, will provide a boost to the tourism potential of the Kashmir valley.

Witness to a Monumental Journey of Development

Sanjay Singh
Senior Journalist

This was the first quarter of 2017. I was invited to accompany a team of journalists visiting the site of the world's highest railway bridge being built on the river Chenab in Reasi district of state of Jammu & Kashmir. I was thrilled as I only read or heard about the bridge and was unaware of the challenges and difficulties of the work. Next day we reached New Delhi station in the evening and took Shri Shakti express to travel to Katra. On the train, we got a rough idea of the project schedule. And after a brief conversation with the railway officials we were advised to go to sleep so as to be ready for de-boarding at Katra early next day.

At Katra, a cavalcade of sturdy SUV cars, with alert drivers was waiting to take us to a hotel. After reaching the hotel we dropped our luggage there and restarted our journey so that we could reach and have our lunch at the base camp in Reasi by 10 AM. As our cars were lighter and spacious now, we felt relaxed. Soon we crossed the plain stretches of the city of Katra and started moving on the hilly terrain of Reasi, the colour of our faces changed. Road ahead was rough and bumpy and it kept getting worse. On our right we could see monstrous rocks passing by. They were smooth and rough, straight and angular and multi-coloured. In some places, they were leaning towards us as in to smash our heads. On our left, there were deep gorges along with lines of hills and mountains of different sizes, heights and colours. They were mostly husky purple at the top and bluish green at the bottom. Officials told us that this route was specially chosen for us, so that we could see and experience the difficult conditions and challenges of the project. This road was still under construction and was meant

for the movement of the men and material. While its first part had been completed, the second one was incomplete and only base work was done. Work on the third part was going simultaneously with the blasting and cutting of rocks and breaking of boulders to create space for the road. This was the reason why our drivers were experiencing difficulty at some places. Fallen boulders and heavy machinery had blocked the road and only narrow passages were available for maneuvering there. After around four hours of harrowing experience, we were able to reach the camp office where we had our breakfast in a hurry, as we had to leave soon to reach the actual site which was still 4.5 km far. After a shorter and smoother journey of about half an hour, we reached a point where a wider space was created for parking.

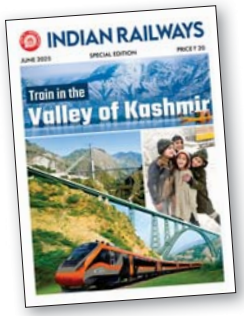
Drivers dropped us there and moved their vehicles to the parking lot. Here we were provided colourful helmets and fluorescent jackets to wear. This was necessary for our safety as we were entering into a dangerous and risky working zone.

From there we started walking on a dusty path. After covering a distance of a few hundred meters, we negotiated a sharp turn and cautiously moved on a slippery slope. Here we could see deployment of CISF personnel who were quite alert standing at a distance with their guns. Now we were close to the foundation of the bridge. Here we were welcomed by the CEO of the project, Anurag Sachan along with the senior officials of Northern Railway, Konkan Railway Corporation and Afcons. Foundation was a mammoth structure the size of half of a football court. On our right was the Chenab river flowing like a blue-green serpentine creeping deep down the hills. With Sachan, BBS Tomar, Chief engineer, Northern Railway too took the task of briefing the media. He threw light on challenges of preparing design, selecting the appropriate contractors and choosing the right materials for the project. How cutting and strengthening of fragile rocks was done and dozens of steel and concrete rods were pushed into the wall to hold it intact. A large and deep well was dug for the stability of foundation. R.R. Mallik, Dy. Chief Engineer threw more light on the process of making the base structures. We were on the Bakkal end side and could see the Kauri end with the same type of structures across the river. Sujay Kumar, Chief engineer, Konkan Railway apprised us about the design of bridge, quality of steel being used and welding and assembling process with challenges faced. We were mesmerised to know that our engineers are such a brilliant lot that they can take any challenge in the world. Their dedication was inspiring and they were really working hard to realise a dream.

From here we were taken to the upper portion of the project where a viaduct was ready for view. Before going up, we were guided towards a workshop under the viaduct. Here assembly work of the arch bridge was being done. There we saw workers cutting and welding heavy steel plates and angles to make segments of the arch. Then we went up on the deck using a steel staircase. From the deck we were able to get a panoramic view of the vast area and the project span. Under the deck a line of tall pillars could be seen. For me they were like the platoon of santris ready to salute their Maharaja who was yet to come. Along the side of the viaduct a small colony of huts was spread on the grassy ground. These were temporary residents and offices of the officials and engineers who had to stay there 24×7 for the monitoring and execution of the work. We went till the end of the deck to have a closer view of huge steel pylons established at both ends of the river for carrying men and material through cables and trolleys to the middle points. On the deck two lines of parallel holes could be seen. They were for nuts and bolts to hold the rails which would be laid after completion of the bridge. On the deck we got more information, like how the bridge was being built to tackle the extreme climatic conditions of the region. Giridhar Rajgopalan, Executive Director of Afcons shared his company's experience helping the project of precision.

At 13.00 hours, we started moving back to the camp office where a lavish lunch awaited us. After lunch we attended the press conference in which local journalists too were invited. At 15.00 hours we were ready to go back to Katra. This time we were provided new vehicles. They were arranged to take a new longer but better route. This information gave us a sense of relief for us and soon most of us were napping except me. So to pass my time and keep the driver awake, I started a conversation with him. Putting his opinion about the project, he told me that this will change the destiny of the people of the state of Jammu & Kashmir who are fed up with the terrorism. Pointing his finger towards the huts on the left side, he said that those were empty houses of villagers who had left them due to threats from terrorists. With the sympathetic attitude of the State Government, terrorists were thriving now in the Jammu region which was free from terror earlier. Instead of local people, terrorists and their relatives were purchasing land and making their houses here and local business and tourism has taken a jolt. But now with this project the situation has started changing. Security was tightened and terrorists were being flushed out. Many local people like me, were getting business and employment due to this project. After its completion when trains start running between Srinagar and Delhi, the whole region will be benefitted. Students would get a better education and traders better deals. Tourism will automatically flourish.

Since seven years have passed and the Chenab project is completed, I am writing this article as a retired journalist. Now I can better understand the technical nitty-gritties, infrastructural difficulties and strategic importance of the project. I feel proud that I have been witness to the development of the project and seen history in making.



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Laying Roads Before Rails

Indian Railways' Pioneering Push in J&K

Anil Sagar
Senior Journalist

Indian Railways' Udhampur-Srinagar-Baramulla link project is linked to the pace of development of the population of Jammu & Kashmir, from where the country travels through the rail network to Kanniyakumari. Under the Udhampur-Srinagar-Baramulla rail link project, 220 km of connecting roads have been built for 100 km of new railway line. This road network has become a lifeline for the population of Kashmir today, which has not only helped them in easy access, assistance in medical emergency, but also in employment and business.

The project connects Katra to Srinagar via Jammu, Udhampur passing through some of the most challenging terrains of the Himalayas. In the initial phase, when work started here, the challenge was how to transport construction material, labour and machinery to the rail construction sites. There was neither a strong network of roads nor proper connecting routes to go from the main road to the rail site.

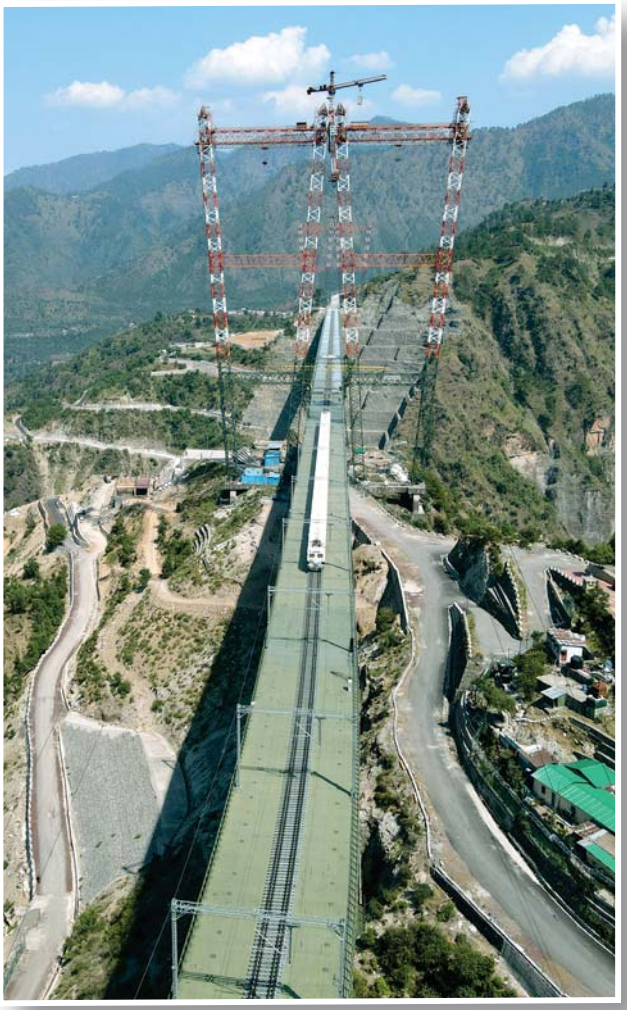
These roads built to transport construction material and labour have now become a valuable infrastructure, giving better connectivity to the people living between Jammu and Srinagar. Railways has also done life changing work for socio-economic development of the hill areas while constructing new rail lines between Katra and Srinagar as part of USBRL project.

The line is witnessing many historic firsts amidst geological challenges across the Pir Panjal mountain ranges.

Another notable feature of the project is a 67 km escape tunnel and ballastless tracks have been built along the entire length. The foundations of many bridges, including the Chenab Bridge, the world's tallest railway arch bridge and the cable stayed bridge, have been strengthened using 3000 tonnes of steel, which is equivalent to 6000 truckloads of steel. Nearly 400 km of tunnels have been completed, a world record for Indian Railways, in the last 10 years from 2014 to 2024. This has been possible only when a network of roads was built to the construction sites and now this road network is also dedicated to the people of the state.

Villages are Connected with Water Along with Rail and Road

Indian Railways, along with rail line and road, also provided alternate sources of water to about 24 villages here, which were dependent on water from the mountain springs of Himalayas. Due to the construction of the tunnel, the water sources originating from the peaks of the hills and flowing in the residential areas were obstructed. The railways ensured water supply to 20 to 24 villages by making alternate ways above the tunnels, whose water sources from the hilly areas were obstructed due to the construction of the tunnel.



A Memorable Journey on the Kashmir Rail Project

Unlocking Connectivity via the Chenab Bridge

Siddharatha Tiwari
Senior Journalist

Whenever the idea of running a train from Kashmir to Kanyakumari is mentioned, it truly feels like a long-cherished dream has come true. Making this dream a reality required the tireless dedication of thousands of workers and engineers across the country, who worked day and night through some of the harshest terrains and toughest challenges.

I have personally witnessed this dream take shape — seeing people work relentlessly amidst the towering Himalayan peaks, rocky landscapes and riverbanks, all driven by hope and determination. Every obstacle was met with resilience and the spirit of India's workforce turned a decades-old vision into reality.

Connecting Kashmir with Delhi by rail was a dream more than 55 years in the making. It was in the 1970s that the Indian Government first envisioned a railway link to connect Jammu with the Kashmir Valley. The foundation stone for the Jammu-Baramulla Railway Project was laid in 1983, but due to a lack of funding, the project saw little progress.

It was finally in 1994 that the Government approved the Udhampur-Srinagar-Baramulla Rail Link (USBRL), spanning 272 kilometers. In 2002, under the leadership of Atal Bihari Vajpayee, Prime Minister work on the project began in earnest, with a target completion date set for 2009. Recognizing its importance, the Government declared it a National Project in 2004, paving the way for greater focus and resources.

In 2003, the Konkan Railway Corporation initiated the tendering process for the Katra-Banihal rail section, marking a major step forward in the Udhampur-Srinagar-Baramulla Rail Link (USBRL) project. The following year, in 2004, the Government of India officially declared USBRL a National Project, underscoring its strategic importance.

The Jammu–Udhampur rail section, stretching 55 kms, was opened to rail traffic in April 2005, providing the first vital link in the long-awaited railway connectivity to Kashmir.

However, in September 2008, construction work on USBRL was halted due to serious concerns related to safety and stability in the difficult Himalayan terrain. A comprehensive alignment review was undertaken in 2009, leading to major design modifications. Construction resumed in 2010 and the project's completion deadline was extended to 2015.

One of the most critical components of the project, the Chenab Railway Bridge, received its final design approval in July 2012, featuring a steel arch structure—an engineering marvel that would soon become the highest railway bridge in the world.

The Qazigund-Baramulla rail section, spanning 118 km, was opened in three phases. The first phase, covering 68 km from Anantnag to Mazhom, became operational on 11th October, 2008. The second phase, a 32 km stretch between Mazhom and Baramulla, was inaugurated on 14th February, 2009. Finally, the 18 km section between Qazigund and Anantnag opened to rail traffic on 28th October, 2009.

A major milestone was achieved on 26th June, 2013, with the opening of the 18 km Banihal-Qazigund rail section, which includes the 11.215 km long Pir Panjal Tunnel, one of India's longest railway tunnels.

Meanwhile, the Udhampur-Katra rail section, covering 25 kilometers, was flagged off by Prime Minister Narendra Modi on 4th July, 2014, marking another significant leap toward connecting the Kashmir Valley with the rest of the country.

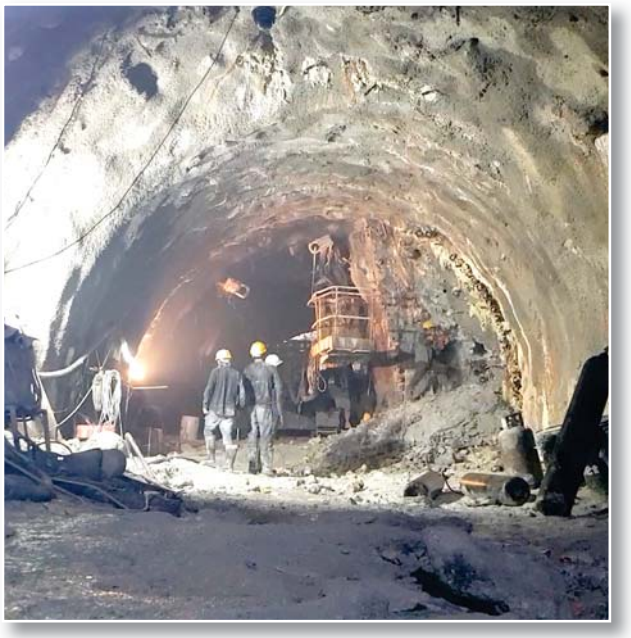
I was present at the Shri Mata Vaishno Devi Katra Railway Station when Narendra Modi, Prime Minister flagged off the first train from Katra to Udhampur. The excitement among the people was truly remarkable. For the first time, devotees travelling to Mata Vaishno Devi from different parts of the country had direct train access. Trains running on this route have since remained packed with pilgrims.

The SVDK station itself stands out for its passenger-friendly design. While speaking with railway officials there, I had only one question: 'When will the train reach Srinagar?' Though there was no clear answer, hope was alive that the rail line would one day connect the Kashmir Valley.

This was my first on-ground experience with a railway project in Jammu & Kashmir. The 25 km stretch between Katra and Udhampur, mostly consisting of tunnels and bridges, was awe-inspiring. Watching a train glide swiftly through the mountains, surrounded by the beauty of the Trikuta Hills, was a proud moment. But the real challenge lay ahead.

In 2016, as part of a media tour organized by Indian Railways, I got the opportunity to visit Reasi to witness the progress of the Katra-Banihal rail link. I entered one of the tunnels being constructed between Reasi and the Chenab Railway Bridge—a nearly 6 km long tunnel under active excavation. Inside, water constantly seeped through the rock and conditions were muddy, noisy and extremely demanding.

Built using the New Austrian Tunnelling Method (NATM), the site was filled with heavy machinery, dust and the sound of constant drilling. A pipeline was installed to supply fresh air inside the tunnel. I still vividly remember wading through the muck, speaking with labourers whose determination was nothing short of inspiring.



Just beyond Reasi lies the Chenab Railway Bridge—the world's highest railway arch bridge—and we trekked through steep terrain to reach its construction site. Looking down from the edge at the river far below, we could see the massive foundation work underway. I was amazed at how engineers had stabilized the rock faces, using techniques like rock bolting and weep holes.

At the site, a model of the completed bridge gave us an idea of the engineering marvel it would become. Workers and engineers explained how unpredictable weather conditions—from sub-zero temperatures to scorching heat—added to the difficulty, along with strong mountain winds.

A dedicated fabrication workshop had been set up nearby, where specialized welding was being carried out for the steel structure. Despite the immense challenges, the spirit of the workforce remained high, driven by the dream of connecting Kashmir with the rest of India through this historic railway project.

After the completion of the arch, work began on placing the steel deck over the Chenab Railway Bridge. This phase was completed in August 2022 with the installation of the Golden Joint—the final connection that joined both ends of the bridge deck. The 785 meter long deck superstructure was launched simultaneously from both the Kauri and Bakkal ends and finally joined atop the arch.

A ceremony to mark the installation of the Golden Joint was held on 13th August, 2022. Following this milestone, track linking work on the bridge commenced. Once the tracks were laid, Ashwini Vaishnaw, Minister of Railways inaugurated the bridge via motor trolley—a special moment I was fortunate to witness.

As we rode the trolley across the Chenab Bridge, it felt like watching a dream unfold before our eyes—each stage of construction flashing in memory. Then, on 26th March, 2023, I again had the opportunity to accompany the Minister of Railways as we travelled across the Chenab Bridge and into the first completed rail tunnel of the Katra-Banihal section.

Ashwini Vaishnaw, Minister of Railways conducted a detailed inspection, examining every element of the work with precision. It was a surreal experience—witnessing what was once a distant dream now turning into reality, built with years of hard work, engineering brilliance and unwavering dedication.

Over the years, I had several opportunities to witness the progress of the railway project between Katra and Banihal. I would like to share with readers that in March 2022, I conducted a detailed review of the work being carried out along this challenging stretch. From how the tracks were being extended from Katra to the complex work happening inside the tunnels ahead—I had the chance to observe it all up close.

During this visit, I met Anil Khandelwal, the then Chief Administrative Officer of the USBRL project, who invited me to enter what is considered the most dangerous tunnel on this route, tunnel T1,

now officially renamed tunnel T33. This tunnel passes through the Main Boundary Thrust (MBT) of the Himalayas and runs directly beneath the shrine of Mata Vaishno Devi, making it geologically and technically one of the most complex stretches of the entire railway network.

When I entered the tunnel for the first time, I was stunned by the conditions. Excavation work was progressing very slowly. Water was seeping in from all directions, sensors were installed throughout the tunnel and each step of the construction was being carried out with extreme caution.

Khandelwal explained that not long ago, a major accident was narrowly avoided due to a sudden and unexpected influx of water inside the tunnel. Following this incident, several national and international experts were consulted to reassess the excavation strategy. Their recommendations led to a revised method—injecting special materials into the rock to strengthen it before carefully resuming the excavation, one small section at a time.

This slow, painstaking process continues to this day. Although the pace of work remains gradual, Khandelwal expressed hope that the task would soon be completed. At the time of my visit in March 2022, the target for project completion was set for December 2022, as prominently displayed at several locations across the site.

After passing through another tunnel, we reached the site where India's first cable-stayed rail bridge was being constructed over the Anji River. As we exited the tunnel, a deep valley stretched below, with the river flowing beneath. Suspended by thick steel cables, workers were diligently carrying out their tasks high above the river. In front of us stood the inverted Y-shaped pylon, a striking structure forming the centerpiece of the bridge.

The design was highly specialized and although much work remained, Khandelwal, who was closely overseeing the entire project, was confident it would be completed on time. The location of this ambitious bridge is in a high seismic zone and strong winds are a regular challenge here. After observing the construction efforts at the Anji bridge, we moved on.

We stayed overnight in Reasi and the next morning, visited the Reasi railway station to review the progress there. Following that, we continued through the tunnels to reach various ongoing project sites. As we approached the Chenab Railway Bridge, we travelled through more tunnels and eventually arrived at SawalKot, a location where an incident had occurred due to the unexpected release of methane gas inside a tunnel, which had led to a fire and injuries among some workers.

Finding methane in Himalayan tunnels is rare, but the Himalayas are known to be full of surprises. The SawalKot station is uniquely located in a space constrained area, with the station itself spread across a rail tunnel and a bridge. From here, we headed toward Sangaldaan, passing several awe-inspiring sites—on one side were towering peaks and on the other, mountain slopes cutting into the terrain, all connected by long railway tunnels leading to Sangaldaan station.

This station is truly unique, built on the mountainside, it is nearly one km long and carved directly into the rock. Part of it is inside a tunnel, highlighting the engineering marvel of this section.

As we moved on from Sangaldaan, we reached the area around Sumber station, located in a known sinking zone. This station, surrounded by landslide-prone terrain and heavy snowfall in winter, is situated in one of the most geologically unstable regions of the project.

Right after Sumber lies Tunnel T50, the longest rail tunnel in this railway project, stretching 12.77 km. After witnessing this engineering feat, we made our way toward Banihal.

On the way, we passed the under construction Arpinchala railway station, which has since been renamed Khari Railway station. Eventually, we arrived at Banihal.

In summary, the 111 km stretch of this railway line is filled with extraordinary challenges from dangerous terrains and tunnels beneath sacred shrines to seismic zones and unexpected geological events. Yet, each section stands as a testament to the determination, innovation and sheer hard work that has gone into making this

Himalayan rail link a reality.

After that, I once again had the opportunity to visit the USBRL railway project site in August 2023, this time on the invitation of USBRL. The aim was to assess the progress of the Katra to Banihal railway section via a motor trolley inspection. Accompanying us on this journey was S.P. Mahi, the then Chief Administrative Officer (CAO), who personally oversaw the inspection from Sumber to Banihal station.

As the motor trolley made its way through Tunnel T50—the longest railway tunnel in the entire project—it felt like India had achieved something truly remarkable. The Sumber Railway Station was fully ready, while Khari Railway Station welcomed us with its own unique charm. By the time we reached Banihal, it was clear that the railway track between Sangaldan and Banihal was complete and trains would soon be running on this stretch.

Following the successful completion of the 48-kilometer rail section, Indian Railways obtained the required CRS (Commissioner of Railway Safety) clearance. Finally, in February 2024, this section was inaugurated by Narendra Modi, Prime Minister who flagged off the first train.

On the day of the inauguration, it was raining in Sangaldan, but as the train moved toward Sumber, snowfall began and by the time we reached Khari station, the entire region was blanketed in snow.

The launch of train services between Sangaldan and the Kashmir Valley, through the snow-covered landscapes, marked the beginning of a new era for Indian Railways and the people of Jammu & Kashmir.

Now, only the Katra to Sangaldan rail section remained incomplete and work on it was progressing rapidly. However, amid all this, tunnel T1 emerged as a major challenge. To maintain momentum, Indian Railways shifted its focus to completing the track between Sangaldan and Reasi. Once this section was finished, the Commissioner of Railway Safety (CRS) conducted an inspection from 26th to 28th June, 2024.

I was fortunate to be invited by Indian Railways to join the entire inspection journey via motor trolley. Watching the CRS examine every detail with such precision was remarkable. Then, on 28th June, 2024, a speed trial was conducted between Sangaldan and Reasi, during which the train was tested at a maximum speed of 110 km/h. I was aboard during the trial and could feel the quality of the track firsthand. After this successful run, the CRS officially approved the Reasi–Sangaldan stretch for passenger train operations.

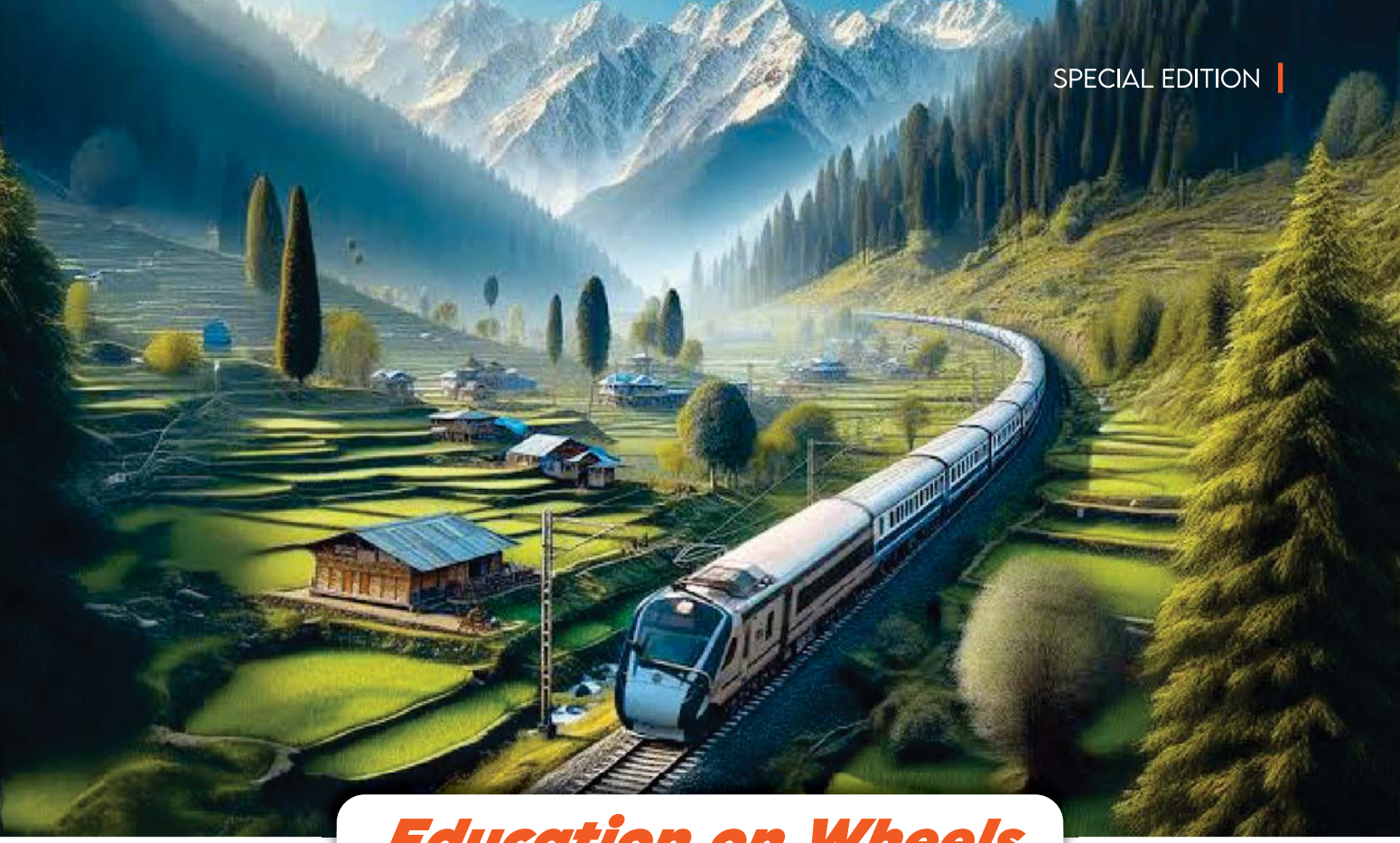
The only pending portion was the short Katra–Reasi stretch, which included the challenging Tunnel T1, now officially referred to as Tunnel T33. By December 2024, this tunnel was finally completed and track-laying was finished. Then, on 7th January, 2025, the CRS conducted a motor trolley inspection of the Katra–Reasi section. I had the honour of being present again for this significant moment.

During this inspection, Sandeep Gupta, the then CAO of USBRL, shared an emotional message. 'I have devoted my entire life to completing this project,' he said. 'I began my career with USBRL and now I have seen it through to the end.'

As we entered the notoriously difficult T1 (T33) tunnel, the transformation was beyond belief. Indian engineers had achieved what once seemed impossible—cutting a broad gauge railway tunnel through the fragile MBT (Main Boundary Thrust) of the Himalayas.

We then visited the Anji Railway Bridge, India's first cable-stayed rail bridge. The very next day, on 8th January, 2025, the final speed trial from Katra to Banihal took place. Our news team was there to witness history being made. The train raced through the most complex Himalayan terrain at 110 km/h, including a breathtaking passage over the world's highest railway arch bridge—Chenab Railway Bridge.

Crossing the Anji Bridge, a moment of pure joy and national pride washed over us. The train weaved through towering mountains, over rivers and valleys and inside India's longest railway tunnels, waving the flag of a nation's engineering triumph.



Education on Wheels

Trains and Boost in Education Sector

Dr. Garima Gupta
Head, Department of Journalism and Media Studies, Uni. of Jammu

Circumnavigating 30 tunnels, 68 bridges especially the arch bridge at the height of 359 meter on river Chenab at Bakal (in Reasi district) and cable bridge at Anji Khad Bridge at Reasi is a marvel engineering design, the Katra-Srinagar Vande Bharat Express, that is a testimony to the vision and perseverance of Narendra Modi, Prime Minister.

In 2016, the social media was blazing with a heart-warming tale from Japan. The tale was about the loss to the government versus the loss to the nation. It was a question of fixing priority: economic vs social profit. And Japan in its very distinguished style chose the latter. The story was of Japan Railways keeping the Kami-Shirataki station open for a single high school student. The station, located on Hokkaido, was initially slated for closure due to low ridership. However, Japan Railways decided to keep it operational until the student graduated, adjusting the train schedule to align with her school timings. The station officially closed after her graduation on 26th March, 2016. Irrespective of whether the story is romanticized or factual, it forcefully foregrounds the significance of ease of mobility in pursuit of equitable and inclusive education.

No doubt it is a transformative milestone in the economic growth of the region and imperative for better regional integration, but it also has far-reaching consequences for the education sector. Traditionally we have heard stories of the hardships of our parents and grandparents who would walk for miles, cross rivers and valleys and traverse difficult terrains to reach their schools or colleges. It is still the same story for many remote

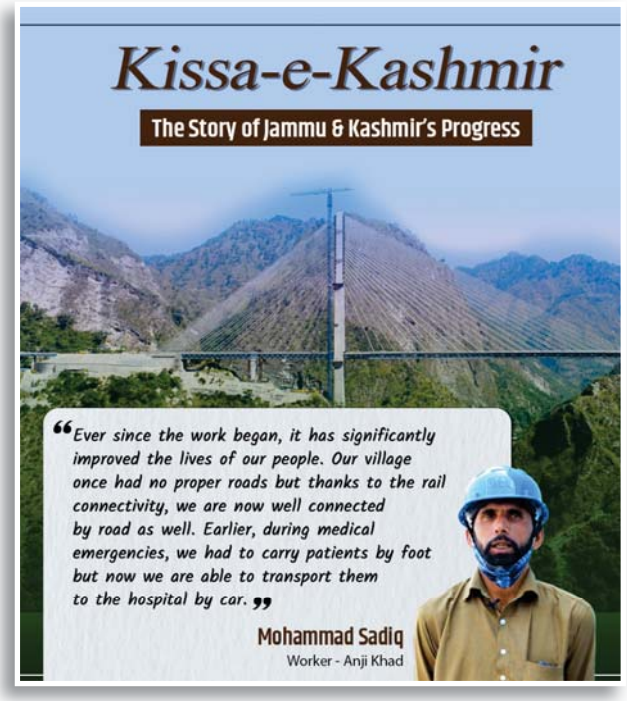
villages of India and understandably so. But Kashmir has always been an urban and highly developed center for learning and for the region to have lack of access to mobility was a serious challenge.

Thus, the train not only marks the triumph of man over nature, vision over adversity but also a cratering of physical, financial and geographical barriers that have circumscribed the education opportunities of the youth of Kashmir. Through this connectivity, not only the access to education is enhanced, but it also creates a ripple effect of positive outcomes that extend well beyond education, resonating throughout society.

The Centre had launched the Prime Minister's Special Scholarship Scheme in 2011 to encourage students from J&K to pursue higher education outside the state. In an interview published in Rediff on 13th November, 2021, Nasir Khuehami, the National Spokesman for the J&K Students claimed that about 60,000 Kashmiri students were studying outside Kashmir. However, their only mode of transport was either through flight, which is not economically viable for everyone, or by road that would be a treacherous travel through long winding route and closure for days during winters and that led to a gender gap in this number. The values of NEP as envisioned by PM were given a tangible form by Manoj Sinha, LG of JK UT as he conceived the futuristic initiative of taking the learning out of classrooms in the form of an educational pilgrimage 'College on wheels-Gyanoday Express' coordinated by the University of Jammu that carried 700 girl students from across the J&K to various places of prominence throughout the country. It involved the concept of inner transformation through the wisdom of journeying. A startling revelation of this initiative was that many girl students from the valley claimed that they had set foot on a train for the very first time in their lives as penned by many of them in the anthology based on this journey 'Of Tales and Travels: Finding the Inner Drumbeat through the J&K Gyanodaya Express' brought out by the University of Jammu. The recent story of the Nuh village carried in The Times of India also compellingly foregrounds how lack of ease of transport results in gender gap in literacy as the overall literacy rate in the district was only 56.1% although the male literacy rate was 73% as the female literacy rate stood at a mere 37.6% due to lack of viable means of transport. The Katra-Srinagar Vande Bharat though a blessing to the entire valley and to the students in general, it is more so a redeemer for the young women of the region who can have better access and hence more opportunity to excellence in education outside the region as well.

Thus the railway link between the valley and the rest of the nation is also a link of opportunities and access that seems to address various Sustainable Development Goals in education like SDG1 i.e. Empowerment and SGD5 i.e. gender equality which would be addressed by promoting education among women through ease of mobility leading to their empowerment; SDG4 that speaks of access to quality education that would be achieved through enhanced connectivity and SDG10 that addresses reducing inequalities by making affordable transportation accessible to students from different economic backgrounds. Thus the Katra-Srinagar Vande Bharat is a boon for the students of the Valley.

The Katra-Srinagar Vande Bharat understood in this context not only represents a catalyst from economic growth, tourism expansion and regional integration, it is a means of fostering a transformative ecosystem that will metamorphose the valley out of its cocoon-larva to a butterfly.



How Chenab Bridge and USBRL Project is a Game Changer for INDIA

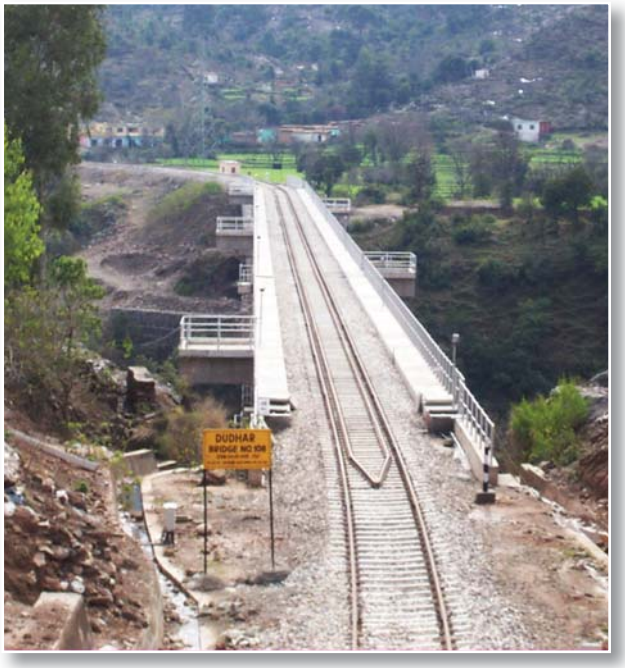
S. Bharti
Writer

Before saying any thing about USBRL project, I just wanted to share my memory. It'a 15 years old incident. A train coming from Baramulah halted at the Srinagar railway station. Those days, there was train service only between Srinagar valley and Baramulah. As the train stopped at the station, many passengers got down from the train and started running outside.

It was a beautiful weather and heart touching scene of Srinagar railway station, made of wonderful exquisite wooden carvings, reflecting artistic heritage of Kashmir valley. And suddenly running of passengers at the platform seemed as if some one has hurled a stone in to stagnant and calm water of lake and ripples of restlessness starts.

The question must be also rising in your mind that why people were running here and there. Right now, you yourself guess it, but the answer of this question, you would get in the article ahead, which is about to prove wrong to all your speculations.

In order to understand, the contribution of the holy Ganga river in Indian culture and civilization of its different forms, languages, culture from Kashmir to Kanyakumari, you have to visit many places. It is possible that in this journey you find yourself quite different from others in many places.



For example, if you belong to North India and reach any part of South India, you may find a lot of new things. But, when you reach any railway station in the same region you will experience an exciting scene of closeness with the passengers when any train arrives at the platform. This train, you might have seen in Delhi, Mumbai, Lucknow, Patna and Kolkata etc. Among the unacquainted passengers, you will spot people of your type, creating a sense of old acquaintance. This is the unique power of Indian rail, binding every corner of the nation from North to South and East to West. The same train, the same track, the same whistles, the same sounds, the same coaches and the same berths i.e everything seamlessly uniform here.

Being the cheapest and largest mode of public transport, the Indian Railways has successfully connected to vast areas and their cities, offering an affordable and convenient journey to the passengers.

But after seven decades since the Independence, the people of Kashmir valley did not get benefited with this lifeline of Indian Railways. Many factors, such as lack of political will, insufficient allotment of budget and Kashmir's rugged and challenging geology kept Kashmiris deprived of it.

Every day, over two and half crore people in India travel by 7500 trains—arguably equivalent to the entire population of a country like Australia. The Indian Railways network now connects well to the entire country. One of the most remarkable milestones in this expansion has been connecting the Kashmir Valley to the other parts of India. In recent years, under the current government, efforts to extend rail networks into the Northeastern states have also progressed at a war footing.

Connecting Kashmir to the rest of Indian Railway system was part of a long-awaited dream of Kashmiri people for several decades since independence.

But the task of materializing that dream into a reality, was full of hurdles and obstacles. From bad weather conditions, attempts by terrorists across the border and even the COVID-19 pandemic, the project encountered disruptions of every kind.

In fact, laying of tracks through Kashmir's rugged terrain was not an ordinary task. The Udhampur-Srinagar-Baramulla Rail Link (USBRL), spanning 272 kilometers, involved the construction of 943 bridges—both large and small. Along this route, engineers also carved out 38 tunnels through mountains. Astonishingly, 119 kilometers of the USBRL passes through these tunnels alone.

The longest tunnel in this route is the 12.75 km Sangar-Arpinchala tunnel, known as T-49. The second longest is the Pir Panjal tunnel between Qazigund and Banihal, stretches 11.2 km and is designated T-80.

To understand the scale of this achievement, one must consider the intricacies of tunnel engineering. Even constructing a single small tunnel in mountainous terrain is a complex and delicate task—a minor miscalculation can completely alter the alignment. Building bridges in such valleys presents its own set of technical difficulties. Unlike the flat plains where engineers have multiple options, these regions demand a highly specialized approach with no room for even minor error.

That more than a thousand tunnels and bridges were successfully constructed between Jammu and Baramulla is engineering marvel. It underscores the extreme geographical challenges the USBRL project had to overcome.

Many travellers feel a sense of wonder when they pass through a single tunnel on their way to places like Shimla or Nainital. In contrast, the journey from Jammu to Srinagar winds through dozens of such tunnels—each with its own story of struggle and triumph.

Several of these tunnels were built under intense challenges, particularly due to the continuous seepage of water during excavation and the fragile nature of the Pir Panjal range—part of the younger and geologically unstable stretches of the Himalayas. It required extreme precision, patience and attention at every step.

The engineers of Indian Railways, along with thousands of dedicated workers, executed this highly sensitive and dangerous project with outstanding skill and resilience.

The Chenab Bridge: A Marvel of Modern Engineering

Among all the feats accomplished under the USBRL project, the most astonishing is the Chenab Bridge, constructed in the Reasi district of Jammu & Kashmir.

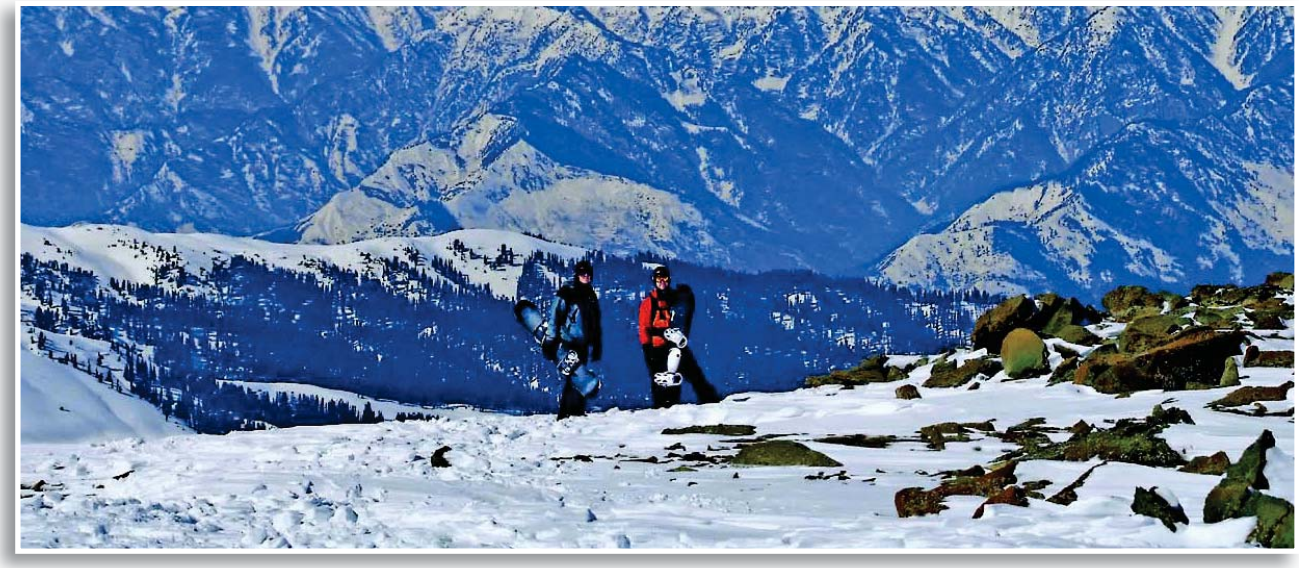
Touted as the world's highest railway bridge, this engineering marvel has broken several records and stood out as the most challenging part of the project.

Spanning the Chenab River, the bridge connects the regions of Kauri and Bakkal. It stretches 1,315 meters in length and soars 359 meters above the riverbed.

To put that height into perspective—it stands nearly 30 meters taller than the Eiffel Tower in Paris and is five times the height of Delhi's iconic Qutub Minar.

What makes the Chenab Bridge even more remarkable is that it is an arch bridge—with no support pillars beneath it. From a distance, its sweeping curve resembles a crescent moon.

Not only has the bridge erased the physical distance between Kauri and Bakkal, but its architectural elegance is set to attract tourists as



well. In this remote and rugged region, the Chenab Bridge stands as a symbol of India's growing technological prowess and has become a subject of academic interest for engineering students and researchers across the globe.

The Himalayas continue to be an area of intense study for geologists worldwide. The exact site where this bridge is built lies in a seismically sensitive zone. Keeping that in mind, Indian Railways collaborated with international experts and undertook a thorough geological and technical assessment before initiating construction.

Approved in 2003, the Chenab Bridge took nearly two decades to complete. Given its location near India's border, the structure was designed with exceptional strength and resilience. It can withstand wind speeds of up to 266 kilometers per hour and is built to endure potential attacks, making it highly secure in the face of regional tensions.

With one neighbour persistently engaging in territorial provocations and another constantly scheming, the Chenab Bridge equips the Indian military with a significant strategic advantage. If ever road routes are compromised, the railway now serves as a reliable, year-round alternative. It reduces the army's dependency on treacherous mountain roads and enhances logistical efficiency. While operational specifics remain classified, it is worth noting that the bridge is robust enough to endure an explosion of up to 40 kilograms of TNT.

Standing on 175 high-strength steel piers, this bridge has brought a revolutionary change to connectivity in Jammu & Kashmir. For the first time, the Valley is equipped with an all-weather transportation link that remains uninterrupted throughout the year.

Historically, even the British, who laid down an extensive rail network across undivided India, including present-day Pakistan and Bangladesh, never attempted to connect Jammu & Kashmir by rail. Until recently, road travel from Jammu to Kashmir was the only feasible route. Now, reaching Kashmir has become faster, more affordable and more comfortable—not only for tourists, but also for military and essential supply chains.

Previously, the road journey from Katra to the Valley took seven to eight hours on winding mountain roads, often plagued by rockfalls, snowstorms, or heavy tourist traffic. A single minor obstacle could stall the journey for hours. But with the completion of this rail link, the travel time from Katra to Srinagar is effectively halved and the route remains operational throughout the year, regardless of the weather.

When Workers Arrived by Helicopter

To meet the scale of the geographical challenges faced during the construction of the Chenab Bridge, consider this, in the early days of the project, labourers had to be airlifted by helicopter to the worksite.

These workers constructed a helipad on the site, enabling engineers and technical teams to reach the remote location and begin operations on the ground.

In fact, in the initial stages, engineers working on the project had to trek long distances on foot or rely on mules to reach various construction points. Moving heavy machinery and construction materials to the site required the building of several kilometers of approach roads through difficult terrain.

Surprisingly, once the Indian Railways constructed approach roads to the site, something unexpected happened—cars began appearing outside houses that had never seen vehicular access before.

The very beginning of the Chenab Bridge project brought the first wave of development to the region. Locals already had the means to purchase vehicles but were held back by the lack of roads. Long before the railway line became operational, the project had already rewritten the story of development in this region.

South of the Chenab Bridge, the same railway line crosses yet another breathtaking marvel—the Anji Khad Bridge, built over the Anji River.

Often overshadowed by the grandeur of the Chenab Bridge, the Anji Khad Bridge holds its own unique place in the history of Indian Railways. It is the first cable-stayed railway bridge ever built in India.

Located around 80 kilometers from Jammu city, the Anji Bridge stands against a stunning backdrop of snow-capped mountains, enhancing its already mesmerizing appeal.

If the dense forests of Satpura once inspired poets, the elegance of the Anji Bridge is sure to stir the imagination of future writers and artists. Built along the Katra-Banihal section, the bridge spans 725 meters and rises to a height of 331 meters above the riverbed.

The Taste of a Fresh Apple

I can remember an incident of ten or twelve years ago. During a trip to Kashmir, we spotted a roadside vendor in a rural area selling freshly plucked apples.

The man had arranged the apples on a cloth right beside the orchard, much like you'd find mangoes or guavas sold in North Indian villages.

It was surprising because, at that time, apples in Delhi were selling for around ₹150 per kg. I asked him about the price and in a mix of the local dialect and Hindi, he replied—₹15 per kg. That was the first surprise. The second came soon after.

Skeptical, we asked, "Are they sweet?" Without hesitation, he invited us to pick any apple and taste it.

As I bit into one, I hadn't expected it to be so juicy that the nectar dribbled down my chin and even soaked my shirt. We ended up buying nearly 20–25 kilos and shared them with friends and family back home. Everyone echoed the same reaction: the apples we get in city markets are either days old or have spent time in cold storage.

A local fruit seller nearby told us that nearly 70% of Kashmir's population is involved in fruit cultivation and trade. But back then, sending these fruits to major markets in Delhi, Haryana, or Punjab was a logistical and financial challenge. High transport costs and unpredictable delays—often due to blocked roads—meant significant losses when the fruits perished en route.

Now, with direct rail connectivity, the situation is poised to change. Not just large traders, even common orchardists can reach wider markets more affordably, making their businesses more sustainable and profitable.

Kashmir's Tourism Resumes Once More

"If there is a paradise on earth,

it is this, it is this, it is this."

The legendary couplet reflects the timeless allure of Kashmir. From its pristine landscapes to its rich culture, Kashmir has always captured the hearts of travelers.

The intricate copperware, the soulful cuisine, the aromatic Kahwa and the golden threads of saffron—speaks of grace and heritage of kashmir.

Breathing the crisp mountain air is a great experience here, while the beauty around feels like an unforgettable gift.

There is an old saying, 'words are a very poor substitute for thoughts and emotions.' Words often fall short in capturing the magic of the valley.

To truly feel it, you must visit Kashmir. And now, reaching Kashmir has become easier than ever before. Earlier, you had two options: expensive flights or long, winding roads that could cause unease for many. But now, Indian Railways has completed what is considered the most ambitious railway project of independent India.

With the new railway line, Kashmir is now accessible via an affordable and comfortable route—one that isn't hindered by heavy snowfall or traffic snarls. For the first time, all weather connectivity to Kashmir is a reality.

The direct train between Jammu and Srinagar is not only cost-effective but also saves nearly half the travel time compared to the road journey. Weather-related delays, snow-blocked roads, or traffic jams are no longer an issue.

The USBRL project is a game-changer for tourists who may not be able to handle long road trips or afford air travel. For them, this USBRL project is a blessing.

And beyond tourism, the project also strengthens India's strategic presence in the region. Given the geopolitical sensitivities involving two neighbouring nations, robust rail infrastructure brings both economic and strategic advantages. While it's not appropriate to discuss all of these in detail, it's clear that the USBRL has significantly reshaped Kashmir's future.

Why were people running?

Now the answer to the question that must have been in your mind since the beginning of this article.

Usually you must have seen people rushing to catch the train at the platform or sometimes running towards their coach. This was the first time for me to see people getting off the train and running outside.

To overcome this surprise, when I looked outside the Srinagar railway station, I found that there were a couple of buses standing there and people were running to board the bus. If they did not get a place in the bus, then reaching to the destination would have become a big struggle. Such was the condition of public transport in this area.

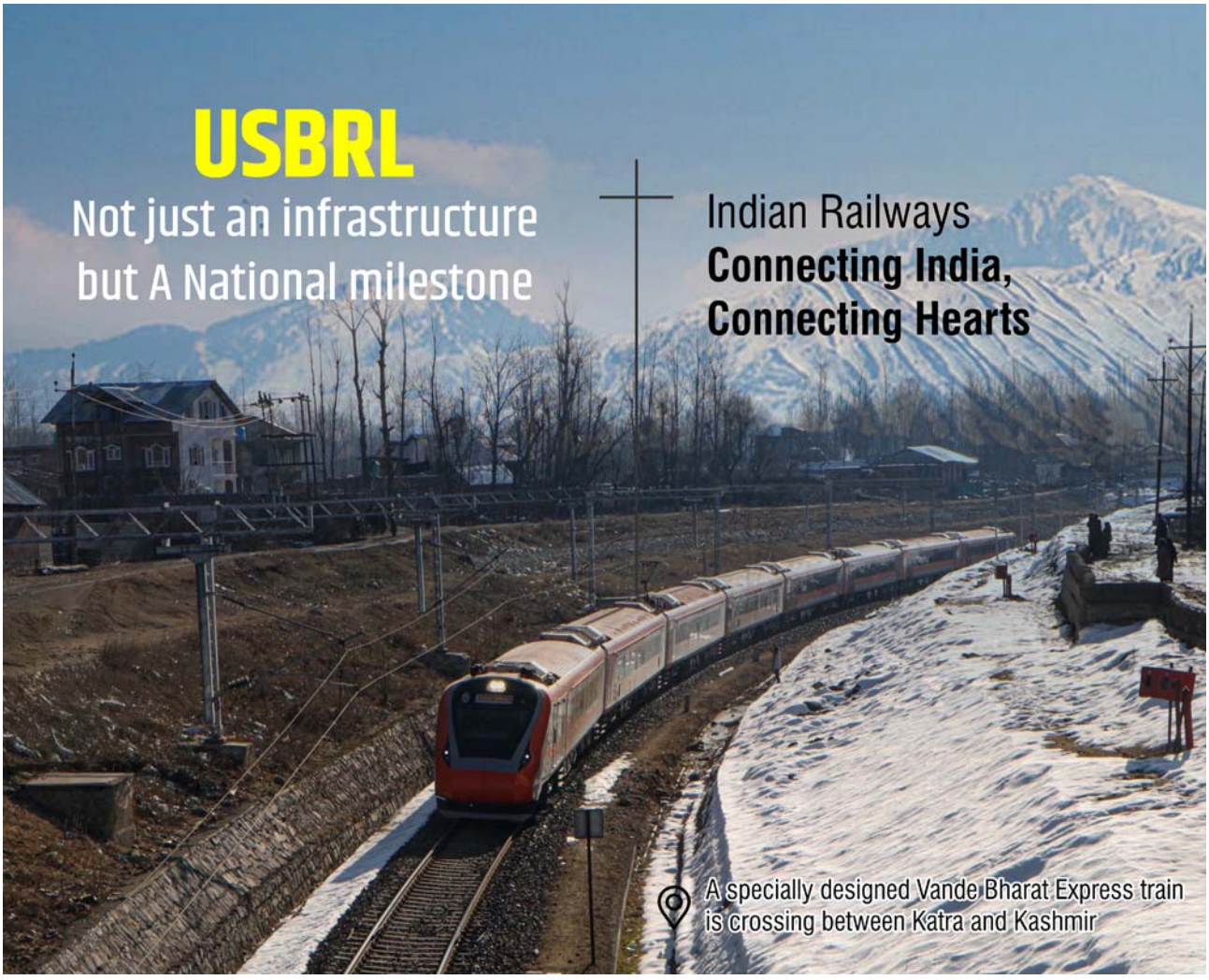
In fact, till that time people did not have any train facility to go to any area between Srinagar and Jammu. There was also no road connectivity in every season and especially in winters, life seemed to have come to a standstill.

You may be surprised to know that it has taken thirty years for the USBRL project to be completed.

The Udhampur-Srinagar-Baramulla-Rail Link Project was approved in 1994-95. But this state, situated between mountains and valleys, remained a victim of political neglect for many decades even after independence.

Things began to change in 2002 when the then-Prime Minister Atal Bihari Vajpayee declared USBRL, a national project. That decision ensured that funding would no longer be a bottleneck and the central government took responsibility for the budget.

When the Modi government came to power in 2014, it pushed the project forward at a war footing. Continuous monitoring and priority-level execution finally made it possible to turn the long-held dream of full rail connectivity between Kashmir and the rest of India into a reality.



New Heartbeat of KASHMIR

The mild chill of April and the blooming spring...snow-capped Himalayan peaks, a pink blanket of blossoms on apple trees and lush green meadows—this will no longer be just a dream. Soon, you will witness it all first hand while travelling in the specially designed Vande Bharat train for Jammu & Kashmir. As the train glides through the valleys of Pahalgam, the greenery-draped landscapes, vast pine forests and glimpses of shepherds will make you pause in awe. With Vande Bharat slicing through the serene silence of the deodar forests, you will soon experience a breathtaking fusion of technology and nature, commitment to innovation, enhancing regional connectivity and introducing a new era of modern rail services.

With this, reaching the Kashmir Valley in any season will now be easier, with ehanced passenger services and tourism experiences in the region.

A Marvel of Engineering

Manufactured under the 'Make in India' initiative at the Integral Coach Factory (ICF), this semi-high-speed train is equipped with state-of-the-art technology and top-tier amenities. Designed for both speed and comfort, it glides smoothly while ensuring a safe and efficient journey. This remarkable innovation by Indian Railways is bound to fill every Indian with pride, proving that New India's engineering is truly extraordinary!

Ensuring Connectivity in Every Season

This Vande Bharat Express is equipped with state-of-the-art technology and advanced features to ensure reliability, safety and passenger comfort. Designed to facilitate smooth travel in the challenging climatic conditions of the Kashmir Valley, this train reflects Indian Railways' commitment to innovation, enhancing regional connectivity and introducing a new era of modern rail services.

Seamless Rail Services Even in Sub-Zero Temperatures

With this, reaching the Kashmir Valley in any season will now be easier, with ehanced passenger services and tourism experiences in the region.

Silicone Heating Pads: These prevent water from freezing in the water and bio-toilet tanks. They also come with overheat protection sensors to ensure uninterrupted operations even at zero or sub-zero temperatures.

Heated Plumbing Pipelines: Self-regulated heating cables prevent water from freezing even at temperatures below zero degrees.

Auto-Draining Mechanism: This mechanism prevents water from freezing in plumbing lines, ensuring smooth and obstruction-free operations.

Safe and Comfortable Travel

To ensure the safety and convenience of the driver in Kashmir's challenging conditions, this Vande Bharat train is equipped with cutting-edge technology for seamless travel:

- **Embedded Heating Elements:** Installed in the front lookout glass, these elements defrost the windshield in cold weather, providing a clear vision for safe train operations.
- **Anti-Spall Layer:** This layer ensures driver safety during snowfall or storms, aiding in secure train operations.

- **Safe and Comfortable Work Environment:** The train is specially designed to withstand extreme weather conditions, providing railway staff with a safe and comfortable working experience.

A Journey of Development

The launch of Vande Bharat Express in the Kashmir Valley marks a historic transformation in rail travel. This service will ensure seamless connectivity in all seasons, overcoming challenges such as heavy snowfall, extreme cold and rugged mountainous terrain. With modern amenities and climate-specific adaptations, this train will offer passengers a superior travel experience. By unprecedentedly linking the Kashmir Valley with the rest of the country, Vande Bharat Express will bridge geographical and economic gaps, bringing development closer to the region.

Next-Gen Technology and Passenger Amenities

Several technical advancements have been incorporated for the smooth operation of this Vande Bharat train and to enhance passenger comfort.

Air Dryer System Heating

Maintains the efficiency of the air brake system in extreme cold. Additionally, the heating, ventilation and air conditioning (HVAC) ducts ensure a comfortable journey for passengers.

5 kVA Transformer

Specially installed under the frame to ensure the smooth operation of key train components and maintain efficiency in cold weather.

Fully Air-Conditioned Coaches

Equipped with semi-high-speed capabilities (up to 160 km/h) for fast and timely travel.

Modern Features

Wide gangways, automatic plug doors, mobile charging sockets, infotainment systems and CCTV facilities enhance the passenger experience.

Steel Tracks in the Mountains

Boosting Connectivity

Prof. (Dr.) Dushyant Kumar Rai
Department of Journalism and Media Studies, University of Jammu

When the first Srinagar-Katra Vande Bharat Express pierced through the chilly morning air of the Kashmir Valley with its resounding whistle, it was not just the launch of a new train service. It was the stirring arrival of hope, unity and self-reliant progress in one of India's most sensitive and historically significant regions. That whistle echoed far beyond the tracks—it resonated in the hearts of farmers, artisans, students, soldiers and traders who had long awaited a swift, modern and secure transport system.

Indeed, the Srinagar-Katra Vande Bharat Express is a triumph of engineering. But more than that, it is a pulsating celebration of political vision, social aspiration and cultural connectivity. It stands as the physical embodiment of the Government of India's commitment to not only bridge the geographical distance between Jammu & Kashmir and the rest of the country, but also to accelerate the region's participation in national economic, logistical and cultural networks.

A Long-Awaited Dream: The Silent Railway Void of Kashmir

The history of Indian Railways is vast and illustrious, yet for Kashmir, it has long been a history of absence. While proposals to bring railways to the Valley surfaced even during the British era, they never materialized. Post-

independence, the rail line reached Jammu in 1971, but for Srinagar and beyond, the railway remained a distant political promise—often repeated, rarely acted upon.

It was only in 2002 that the dream began to assume a concrete form. Atal Bihari Vajpayee, then Prime Minister announced the Udhampur–Srinagar–Baramulla Rail Link (USBRL) project, setting into motion what would become one of the most complex railway ventures in Indian history. Yet even after its inception, progress was slow. The terrain through which this line had to pass was daunting, layered with not only formidable geographic challenges but also a volatile security situation and multifaceted administrative hurdles.

Engineering Triumph Amidst Himalayan Obstacles

Constructing a semi-high-speed rail corridor through the rugged peaks of the Pir Panjal range, across volatile riverbeds, seismic zones, snow-laden slopes and landslide-prone areas was a daunting task. Yet Indian engineers took on this challenge with resolve and innovation.

The T-49 tunnel along this route is now India's longest railway tunnel, spanning nearly 12.75 km. But even more iconic is the bridge across the Chenab River—now the world's highest railway arch bridge, rising 359 meters above the riverbed, even taller than the Eiffel Tower. This feat is not just an engineering marvel but a proud symbol of India's determination and technological prowess.

The Anji Khad Bridge, supported by a single pylon and 96 stay cables, is another striking achievement. With its asymmetrical design and elevation of 193 meters above the river, it stands as a gleaming testament to both beauty and functionality. Together, these structures seem to cradle the train in the arms of the Himalayas, as if nature itself is applauding the resolve of Indian Railways.

Political Vision and Administrative Will

While engineering brilliance played a key role, the success of USBRL and the Vande Bharat launch is equally a story of political commitment and administrative coherence. The rapid progress of this railway project became a symbol of that renewed national intent.

Under Narendra Modi, Prime Minister the project was included in the Gati Shakti Master Plan to ensure synchronized development across transport sectors. Recognizing its strategic importance, the Ministry of Finance allocated special capital support.

Meanwhile, the local administration under Manoj Sinha, Lt. Governor worked diligently on the ground. Land acquisition, rehabilitation, security coordination and clearances were handled with unusual swiftness and efficiency. At the grassroots level, awareness campaigns helped gain public trust, while prompt handling of environmental and logistical hurdles facilitated seamless progress.

Vande Bharat: Kashmir's Pulse of Progress

The Srinagar-Katra Vande Bharat Express is more than a train—it is a harbinger of transformation. Equipped with indigenous manufacturing, smart coaches, AI-enabled systems and semi-high-speed capabilities, it signifies a new era of travel. It

reduces travel time, ensures comfort and introduces efficiency in a region where connectivity was long overdue.

Pilgrims headed to the Mata Vaishno Devi shrine in Katra can now easily extend their journey to the serene locales of Gulmarg, Pahalgam or Dal Lake. For local residents, the train opens doors to better access in education, healthcare and employment. The increased mobility has already boosted tourism, with longer average tourist stays leading to higher earnings for hoteliers, taxi drivers and local guides.

The Economic Ripple: Trade, Transport and Local Prosperity

The significance of this railway line extends far beyond passenger travel. It is poised to transform the logistics and trade dynamics of the region. Indian Railways plans to begin freight movement on this route, which will revolutionize the transportation of agricultural produce, handicrafts and perishable goods from Kashmir to the rest of India.

Rail is inherently more economical and efficient than road or air transport for bulk goods. One cargo train can carry thousands of tonnes over long distances with minimal emissions and energy usage. This means cost reductions for logistics firms, fewer trucks on overburdened highways and lower carbon footprints—a triple win for economy, infrastructure and environment.

Cold-chain infrastructure is likely to follow, including the deployment of reefer wagons (refrigerated containers) to safely carry apples, walnuts, honey, dairy products and saffron. This will prevent spoilage, ensure time-bound delivery and fetch better prices for Kashmiri farmers and traders. Plans are also underway for setting up integrated logistics hubs, specialized storage terminals and parcel centers that will make the region a vibrant node in India's national supply chain.

Craftsmanship on Track: Boosting the Artisan Economy

Kashmir's rich tradition of handicrafts—paper-mâché, copper engravings, Pashmina, Kani shawls and walnut woodwork—has long suffered from limited market access and high transportation costs. The new railway link is poised to change that. Products can now be sent safely and economically to metros like Delhi, Mumbai, Kolkata and Bengaluru.

With schemes like 'One State One Product' and the GI-tagging of select Kashmiri handicrafts, the Government is also pushing branding and marketing initiatives. Faster and more reliable transport will enhance competitiveness, giving a fillip to exports and opening global avenues for Kashmir's artisan community.

A Green Corridor for Sustainable Development

From an environmental perspective, rail transport is far more sustainable than trucking or aviation. Per ton-kilometer, trains emit significantly less carbon dioxide, making the Srinagar-Katra route a green corridor. In a time when climate change and sustainability dominate global agendas, the Indian Railways is emerging as a key stakeholder in India's clean energy transition.

This shift also aligns with India's commitment under the Paris Climate Agreement and various SDG (Sustainable Development Goals) targets. The long-term goal is to establish multimodal integration—linking rail to road, air and waterways—to create a seamless, efficient and eco-friendly logistics ecosystem.

Cultural Confluence and National Integration

Beyond economics and infrastructure, the Vande Bharat Express is also a cultural bridge. It facilitates a deeper exchange between Kashmir and the rest of India—students, artists, scholars,

tourists and professionals now have faster, safer ways to engage with each other.

This cultural connectivity fosters mutual understanding, breaks stereotypes and nurtures a sense of shared destiny. As students from Kashmir visit institutions across India and students from the mainland travel to the Valley for cultural or educational purposes, the seeds of a more cohesive India are quietly sown.

A Strategic Asset: Enhancing National Security

In a region as sensitive as Kashmir, connectivity also carries strategic significance. The Vande Bharat Express enhances India's preparedness in times of natural disasters or emergencies. It allows for the rapid movement of armed forces, relief materials and humanitarian aid. In scenarios involving avalanches, earthquakes, or security threats, the ability to respond swiftly can save lives.

Furthermore, this railway undermines separatist narratives that aim to isolate the region from the Indian mainstream. Each train that runs between Srinagar and Katra is a powerful assertion of national unity, of a region connected not just by rail but by spirit.

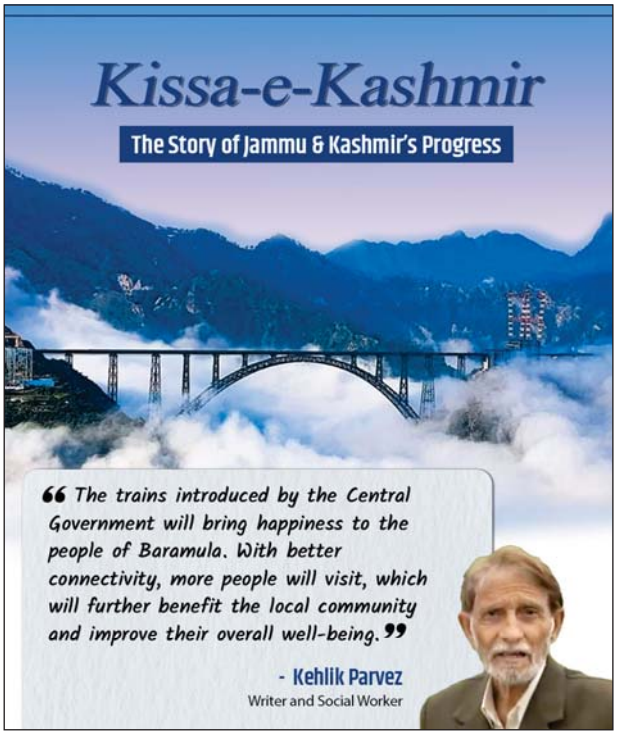
Challenges Ahead: Maintenance and Sustainability

Despite the achievement, challenges remain. The region is prone to heavy snowfall, landslides and seismic activity. Ensuring uninterrupted service will require continuous monitoring, advanced weather systems and investment in resilient technologies. Training local personnel in rail operations and safety protocols will be crucial for long-term sustainability.

The Sound of Progress

The Srinagar-Katra Vande Bharat Express is not merely a train—it is a nation's love letter to its land and people. It is the sound of steel wheels turning over once-forgotten soil, of whistles echoing through snow-covered valleys and of an India that is no longer willing to leave any corner behind.

Each time its whistle blows, it declares—loud and clear—that the dreams of a self-reliant, inclusive and united India are not just in motion, but accelerating.



Kind Attention

AUTHORS/WRITERS contributing articles for the magazine are requested to restrict their articles to a reasonable size. Ideally an article should not exceed 1000 WORDS.

In view of the space constraints of the magazine, sometimes it becomes difficult to include longer articles. All are requested to appreciate our problem and co-operate.

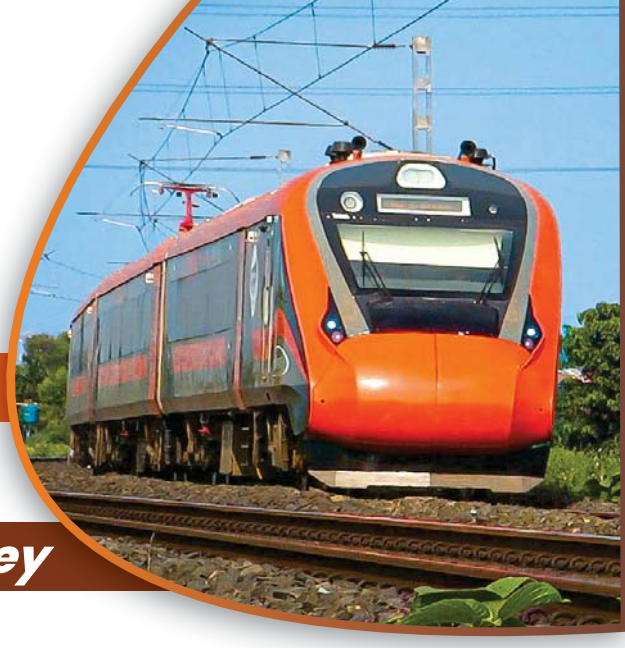
editorindianrailways@gmail.com

Katra to Srinagar Vande Bharat Express

Brings Smiles, Hope

and

All Weather Connectivity to Valley



Dr. Pardeep Singh Bali
Assistant Professor, Journalism and Media Studies, University of Jammu

Firdous Ahmed Buddoo, a skinny man from Srinagar city, operating small business of tours and travels and handicrafts in Katra, from last couple of decades, is exalted over the news of inauguration of Kashmir version of Vande Bharat Express.

'This train will change the fate of Jammu & Kashmir in general and Katra in particular, as it will bring more pilgrims and tourists right to our doorstep,' Buddoo said, adding 'earlier, many tourists avoided the long road journey and exorbitant airfares, but now, with the Vande Bharat, I expect trade to double. It is not just a train but a lifeline for traders.'

'Since independence, no major efforts were made to bring all weather road connectivity for the people of Kashmir. I am thankful to present dispensation, which understood the necessity of having rail connectivity from Delhi to Kashmir,' Buddoo said and added that he is excited to board the train to see the engineering marvels, especially the world's tallest, Chenab Rail Bridge and India's first cable-stayed railway bridge, the Anji Khad Bridge.

Sharing an ordeal, Firdous Ahmed Buddoo said that it was almost impossible to reach Srinagar through road in case of health emergency.

'Last winter, my father had some health complications, I took a cab from Katra to reach

Srinagar, but the problem escalated because due to land sliding at Ramban, the vehicular traffic was halted. I had to wait for 12 hours in a serpentine traffic jam,' he said, adding 'Now, the inauguration of this railway track, with 12 km long T-49 tunnel and multiple bridges, the journey would be easy, fast and convenient.'

In the cold storage building just outside Baramulla, where the crisp scent of apples lingered, **Imran Assadullah Dar**, a third-generation apple dealer, watched his workers pack crates destined for distant markets.

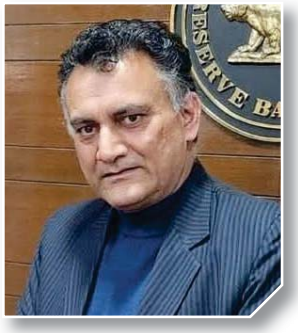
He believes that this journey will take horticulture sector of Kashmir to new heights. 'I have a strong feeling that this train will instill a new lease of life in all sectors of Jammu & Kashmir, including horticulture and tourism. The interaction with people from outside will definitely change some preconceived notions among the local population,' Imran said and added that he look at the train as more than just a mode of transport—it would be a bridge to prosperity.

Meanwhile, in a well lit small workshop filled with the scent of freshly carved wood in Katra, **Priya Devi**, an artisan known for her intricate wood carvings, from Reasi, said, 'For years, I have struggled to send my pieces to the markets of Srinagar because of unreliable transport and exhaustive journey,' she said, brushing sawdust from her hands, adding 'now, with this train, I can reach customers in Srinagar faster and cheaper. It is like world is opening up for artisans.'

She said that her father worked on those tracks. 'He would tell me stories of the mountains fighting back—landslides, snow, everything. To see this train cross that bridge... it's like his sweat is still alive in it.' For her and many others, the Vande Bharat Express is more than transport—it is a tribute to the grit of those who built it, a legacy rolling into the future.

In Srinagar, the mood is a mix of excitement and cautious optimism. **Amina Begum**, a mother of three runs a small handicraft stall near Nowgam station. 'We have waited so long for something like this,' she says, adjusting her shawl. 'The roads get blocked in winter and my kids miss school trips. Now, they can visit Katra and come back in a day. It feels like the world is opening up for them.' Yet, she pauses, her voice softening. 'I just hope the tickets are not too expensive for people like us. We want to be part of this progress, not just watch it pass by.' Her words capture a common thread—pride in the achievement, tempered by a hope that it remains accessible to all.

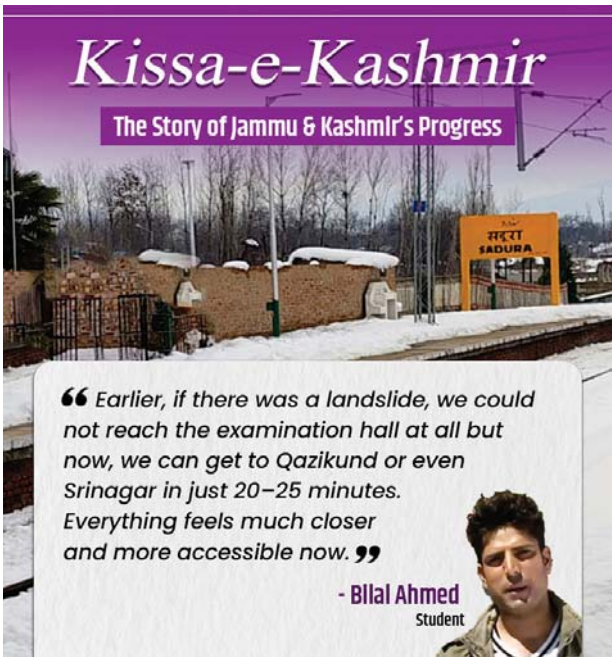
For the younger generation, the train is a symbol of something bigger. **Sameer**, a 22-year-old student in Srinagar, scrolls through his phone, showing videos of the Vande Bharat's sleek design. To him, the train represents connection—not just to Katra, but to opportunities that have long felt out of reach.



Stating that this rail connectivity shall be the gift from Narendra Modi, Prime Minister to the people of Jammu & Kashmir, especially to the people associated with the tourism industry, President Katra Hotel Association, **Rakesh Wazir** said that it will certainly boost the tourism industry of Kashmir.

'There is no doubt to the fact that there would be great influx of tourists from across the globe due to start of Vande Bharat Express in Kashmir and due to necessary halt and change in Katra, people would definitely book their stay in Katra as well,' Rakesh said and added that it will also give push to local artisans and traders.

The Kashmir version of Vande Bharat is equipped with climate-specific adaptations to provide advances heating systems in sub-zero temperatures.



Kashmir Welcomes First Vande Bharat Train

A Game-Changer for Tourism and Economy

Firdous Ahmad Dar
Senior Journalist

Rameez Ahmad, a travel agent based in Srinagar, is finally breathing a sigh of relief. After years of struggling with inconsistent tourist inflow and rising travel costs, his business is witnessing a welcome revival — and a new train service is only adding to his optimism.

'The start of the train service is a game-changer. Many of my potential clients would back out at the last moment. Even though the tour packages were budget-friendly, flight tickets were often out of reach for middle-income families. But now, with a faster and more economical rail option, we expect a sharp increase in bookings,' he said.

The launch of the Vande Bharat service to Srinagar marks a significant milestone in Jammu & Kashmir's infrastructure development and business growth. It not only connects the region with major cities more efficiently but is also expected to give a solid push to the tourism industry — a vital pillar of the local economy.

'We were eagerly waiting for such a service. Kashmir's tourism has been growing for the last few years. Budget travellers were suffering due to exorbitant airfare. As such the start of Vande Bharat will make tours cheaper, hence a go-to-place for tourists across the world,' said **Farooq Ahmad Kuthoo** former president Travel Agents association of Kashmir.

Improved Access for Pilgrims

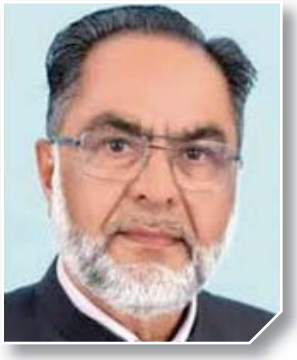
The Vande Bharat Express will significantly ease access for pilgrims travelling to Amarnath cave. Pilgrim tour operators said the religious site will also become more accessible as the overall connectivity of the region improves.

'So far, pilgrims have been either choosing buses or flights. Train service is going to be more convenient and cheaper. We expect a good increase in the number of pilgrims this year as train service starts from Jammu to Srinagar,' said **Mohammad Ashiq Bhat**, another travel agent.

Relief for Apple Growers and Traders

Beyond tourism, the new rail connectivity is

expected to provide much-needed relief to Kashmir's horticulture industry, particularly its apple growers. The sector has been repeatedly hit by disruptions along the Srinagar-Jammu National Highway — a critical artery for trade, which has remained closed for a total of 284 days over the past seven years due to weather-related damages and landslides.



'The closure of the highway has been our biggest hurdle. We faced immense losses due to delayed shipments. Even we couldn't visit our potential markets on time. With a reliable rail network now coming into play, we expect faster, safer transportation of our produce to markets across India,' said **Mohammad Shahbaz Bhat**, an apple dealer.

The apple growers hope for the introduction of freight trains so that perishable fruits like cherry and strawberry are shipped to various cities of India.

'This is the need of an hour. A freight train will be of much relief to the apple growers of the valley in particular,' said President Kashmir Valley Fruit Growers Cum Dealers Union Bashir Ahmad Bashir.

Promise of Better Healthcare Access

The train is also poised to improve healthcare access for Kashmiris, particularly those needing advanced medical care outside the valley. Patients from remote regions often struggle with long and expensive travel to reach specialized hospitals in cities like Delhi or Chandigarh.

'Patients requiring regular treatment or surgeries will now have a safer, more affordable option. It's not just about time saved — it's about lives saved,' said **Aliyas Ahmad Khan**, a medical practitioner.

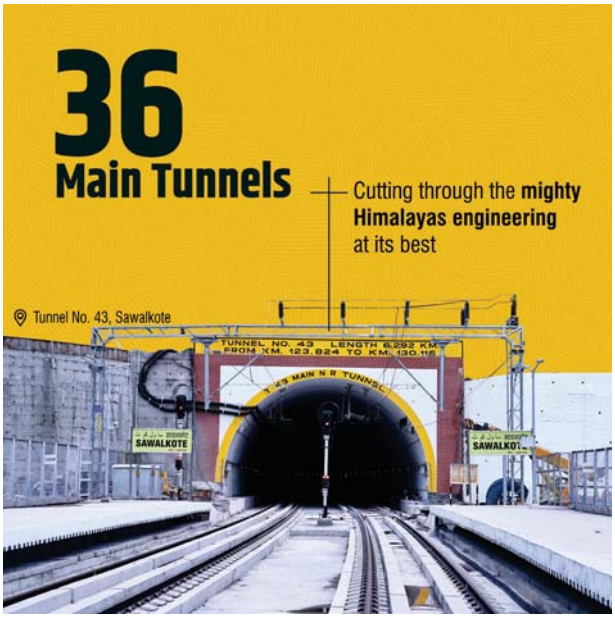
Whispers of Progress

BENEATH THE MOUNTAINS

Amidst the towering heights of the Himalayas, where clouds kiss the earth and valleys whisper secrets, the dream of Indian Railways has taken full shape in the form of the Udhampur-Srinagar-Baramulla Rail Link (USBRL). The grandeur of this project is reflected in its tunnels—hidden corridors that not only conquer geography but also pave the way for the speed of the future. Out of the 272 km USBRL railway route, 36 major tunnels cover nearly 119 km. Some of these tunnels are so long and complex that they have become milestones in engineering excellence.

Tunnel T33

Most complex and critical component of the Katra-Banihal section, spans 3209 meter between Katra and Reasi Stations and stands as the inaugural block section of this vital railway route. Situated at the base of the Trikuta Hills near Katra in Reasi District, Tunnel T-33 traverses the lesser



Himalayas, navigating highly jointed and fractured dolomite. Notably, a challenging section of 300-350m encounters the Main Boundary Thrust

TUNNELS

Katra-Banihal Section

27 Main Tunnels

8 Escape tunnels

Section Lies in Tunnels

97 km route of the

111 km section

The tunnel-T-50 which lies between Sumber and Khadi in Ramban is 12.75 km and is the longest transportation tunnel in India

4 km tunnels of more than

9 km length

Parallel escape tunnels have been constructed along main tunnels more than 3 km in length with cross passages at every 375m to facilitate rescue and restoration work in emergencies as per international standards

(MBT), presenting formidable geological and water ingress challenges during excavation. A major collapse at km 32/131 on 13th October, 2017, led to a prolonged halt in tunnel excavation. Subsequently, a strategic shift to the I-System of Tunnelling from NATM was initiated in March 2022. This approach incorporated deep drainage pipes, umbrella pipe roofing, chemical grouting, face bolting, sequential excavation, rigid support and shotcreting. Adopting the I-System of Tunnelling proved instrumental in overcoming the challenges posed by the MBT, enabling the successful completion of Tunnel T-33.

Tunnel T-34

With a length of 5.099 km, comprises of twin tubes i.e. Main Tunnel (MT) for train operations and a parallel Escape Tunnel (ET) for safety and rescue. The alignment of tunnel T-34 falls between Pai-Khad on portal P1 and Anji Khad connecting Indian Railway's First cable-stayed bridge at portal P2. This twin tunnel system, carved through the Sirban Dolomite rock formations, is connected to Anji Khad Bridge, India's first cable stayed railway bridge, with cross passages every 375 meter, ensuring both safety and operational efficiency.

Tunnel T-36

One of the challenging tunnels along this alignment located in the outer Himalayas with a length of 5.96 km, comprises of Main Tunnel (MT) for train operations and a parallel Escape Tunnel (ET) for safety and rescue. It starts immediately after the Reasi railway station in villages Gran,

initial 86 meter of tunnel is a wider section to accommodate Reasi yard.

New Austrian Tunnelling Method (NATM) philosophy has been successfully used in the construction of this tunnel. The rock mass exposed along the alignment belongs to Sirban group of rock represented by interbedded sequence of dolomite, cherty dolomite, siliceous dolomite, quartzite, slate bands and shale, phyllitic quartzite and banded heamatite jasper part of the Kharikote formation belonging to upper unit of the Sirban dolomite exposed along the alignment. A major tectonic feature i.e., Reasi Thrust passes about 200 meter south of tunnel T-5 due to which the rock mass has undergone shearing and fracturing with development of shear zones.

Tunnel T-42

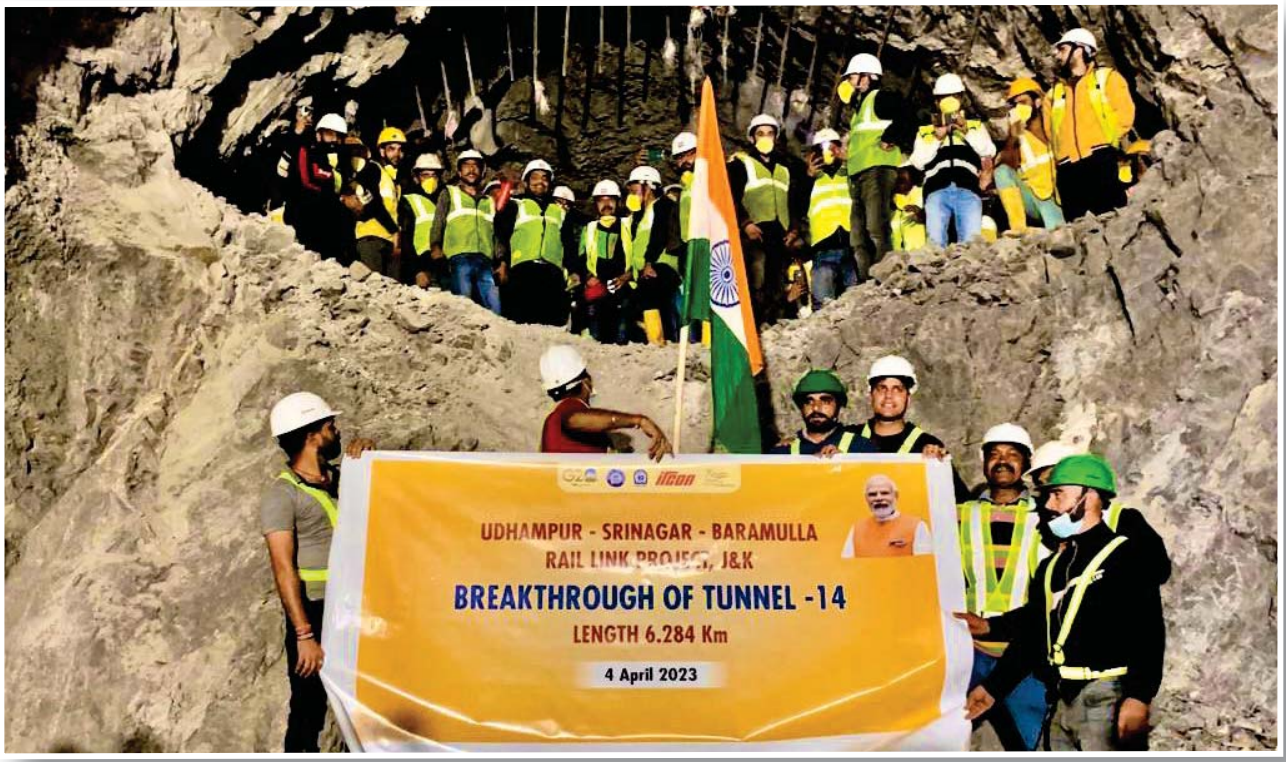
Tunnel T-42, spanning a total length of 9.26 km, serves as a crucial link connecting Dugga yard with Sawalkote station yard. The main tunnel comprises a single section length of 8.0 km and a wider section of 1.2 km, designed to accommodate both station yards at Dugga and Sawalkote.

Tunnel T-43

Lies in the Sawalkote - Sangaldan block section. It's a 6.284 km long tunnel located in the districts of Reasi and Ramban. T-43 faced challenges from tough geology of subathu formation and the presence of methane gas.

Tunnel T-44

With a length of 11.16 km, stands as the third-longest tunnel in Indian Railways. The North Portal is situated in village Sangaldan, while the South Portal is located in the village IND, Tehsil Gool, Ramban district. The alignment of T-44 passes through the challenging Murre Formation, characterized by folded, overthrust and faulted rocks due to high tectonic activities in the Himalayas. The presence of highly jointed and crushed strata, primarily Sandstone, Siltstone and Claystone, adds complexity to the alignment.



Tunnel T-44

Comprises two tubes with a Modified Horse Shoe cross-section the Main Tunnel and an Escape Tunnel. Constructed using the advanced NATM, incorporating modern drilling and blasting techniques. To expedite construction, excavation was strategically planned from both portals and three additional adits at Chakani, Barala and Chachuwa, with a combined length of approximately 1.75 km, were constructed to create additional faces for faster progress.

Tunnel T-49

Boasting a length of 10.18 km, is a modified horseshoe shaped tunnel connecting Sumber Station Yard on the North side to Bridge no. 242 over Chinji-nallah at Dharam village on the South side. This twin-tube tunnel consists of the Main Tunnel (10.18 km) and an Escape Tunnel (9.80 km), interconnected by 24 cross passages. Passing through the Ramban formation of the Young Himalayas, T-49 encounters the Muree thrust at its south end, where Chinji Nallah intersects between T-48 P (2) and T-49 P(1). Several perennial Nallahs i.e. Bhimdasa, Bagdisha and Kohli Nallah, crossing over the tunnel alignment posed additional challenges of heavy ingress of ground water during tunnelling.

Tunnel T-50

Having a length of 12.77 km is India's Longest Transportation Tunnel comprising of Main Tunnel (MT) for train operations and a parallel Escape Tunnel (ET) for safety and rescue. This tunnel is in Sumber-Khari Section. NATM was successfully used in the construction of this tunnel. The Tunnel is a construction marvel. Excavated through Ramban and Ramsu Formations, it encountered Quartzite, Gneiss and Phyllite of Precambrian age. The South Portal lies in the picturesque Sumber Valley in Sumber Village and the North Portal near Arpinchala village in Mahu-Mangat Valley (District Ramban), adds to the grandeur of this engineering marvel.

Tunnel T-52

Having a length of 8.6 km comprises of Main Tunnel and a parallel Escape Tunnel. This tunnel lies in the picturesque Arpinchala Valley in Khari Village and the North Portal near Amkoot village in Guddar Nallah on the Khari-Banihal Section. NATM has been successfully used in the construction of this tunnel. Two Adits were strategically constructed to create additional working faces for construction. Excavated through Ramban and Ramsu Formations, it encountered Quartzite, Gneiss and Phyllite of Precambrian age.

Several Challenges were encountered during construction such as shear zones, perched aquifers, highly jointed rock mass, problems of squeezing and high ingress of water.

Tunnel T-53

Having a length of 2.7 km is Transportation Tunnel comprising of single Main Tunnel (MT). This tunnel is in Khari Banihal Section between Amkoot village in Guddar Nallah and the North Portal near Bankoot village (District Ramban). NATM technology has been successfully used in the construction of this tunnel.

Tunnel T-80

Built under the Pir Panjal range, T-80 tunnel ensures year-round connectivity between Jammu & Kashmir. Overcoming barriers of snowfall and altitude, it significantly enhances transportation and trade and can be termed as 'the backbone of USBRL'.

Tunnel T-33

The most challenging section of the Katra-Banihal stretch, spans 3.209 km at the base of the Trikuta Hills, forming a crucial link to the Kashmir Valley. Navigating highly fractured dolomite and the Main Boundary Thrust zone, it faced severe geological challenges, including a major collapse in October 2017 that halted progress for months.

The project adopted the I-System of Tunnelling in March 2022, incorporating deep drainage, umbrella pipe roofing, chemical grouting and reinforced supports to stabilise the structure. After years of perseverance, a breakthrough was achieved on 20th December, 2023, marking a key milestone in this vital railway corridor.

Tunnel T-23

It is the longest on this section, featuring a ballast-less track between Udhampur and Chak Rakhwal railway stations. In 2008, severe squeezing, swelling and bottom heaving caused major setbacks, requiring expert intervention. Overcoming these challenges, the tunnel was successfully completed, marking a significant milestone in the project.

Tunnel T-1

This tunnel unfortunately also faced the relentless challenges posed by the Main Boundary Thrust, including severe mud and water ingress. To counter these issues, the advanced 'I-System of Tunnelling' was successfully deployed, integrating deep drainage pipes, umbrella pipe roofing and chemical grouting to ensure structural stability and safety.

Tunnel T-25

The construction of Tunnel T-25 spanned six years, marked by the formidable challenge of an unexpected underground water stream discovered during excavation in 2006. This stream discharged between 500 and 2000 litres of water per second, posing significant hurdles. Overcoming this natural obstacle demanded unwavering determination, innovative engineering and relentless effort from the project team.

Stations Built at Great Heights in a Scenic Valley Evoke the Charm of Switzerland

Vimlesh Chandra
Retd. Railway Officer

After independence in India, the railway in the Kashmir valley is the result of a difficult and unprecedented effort. Its bridges, tracks, tunnels, its technical features are unprecedented, the stations are also unprecedented in terms of height. The height of these unprecedented railway stations creates excitement in the sense that most of the stations are built on or near mountains.

All the railway stations of Kashmir Valley Railway have been built very beautifully. Comfortable arrangements have been made for the passengers to sit on their platforms. Clean and beautiful platforms and the view of Kashmir Valley and mountains behind it add to the beauty of this place. When the train runs from here, its beauty increases further on the winding route. During snowfall, it seems as if the trains are wrapped in a white sheet of snow. One does not get to see such view anywhere else in our country. So, we can say that the view of Switzerland can be seen here in Kashmir Valley.

Hiller Shahabad Station : The Highest Station on the Broad Gauge Line

There are four gauges in Indian Railways. If we divide the height of stations according to their gauge, then the highest railway station in narrow gauge (610 mm/ 2 feet) is Darjeeling Himalayan Railway's station 'Ghoom', whose height is 2257.65 meter. This is the highest railway station in all the rail gauges of Indian Railways. Similarly, the highest railway station in narrow gauge (762 mm/ 2 feet 6 inches width) is 'Shimla' station, the last railway station of Kalka-Shimla mountain train, whose height is 2076 meter. Similarly, the highest railway station in meter gauge is 'Udagamandalam' (Ooty), the last railway station of Nilgiri Mountain Railway, whose height is 2203.247 meter.

As far as the height of the highest railway station of Indian Railways' broad gauge line is concerned, it is a matter of new record. With the opening of Kashmir Valley Railway, Indian Railways is achieving new heights everyday and making new records. In this series, a new name was added a few years ago, this was the occasion when 'Hiller

Station at higher altitudes up to 1700 meter

If we compare the height of the stations of Kashmir valley, then the lowest height is of Baramulla station - 1582.789 meter. Apart from this, the details of the stations situated at higher heights are as follows:

Name of Stations	Height (in meters)
Sopur	1594.264
Hamre	1686.577
Pattan	1587.919
Mazhom	1587.437
Nadigam Haltu	1595.310
Budgam	1593.195
Srinagar	1591.795
Pampur	1594.867
Kakpor	1594.966
Tninipora Halt	1593.230
Avantipura	1596.123
Panjagam Station	1597.889
Bijbiara	1599,536
Anantnag	1599.890
Sadura	1633.275
Qazigund	1722.165
Hiller Shahabad	1753.922
Banihal	1705.928
Khadi	1560.276
Sumber	1417.599
Sangaldan	1232,085
Sawalkot	1036.343
Dugga	938.347
Bakkal	857.167
Riyasee	807.825
Shri Mata Vaishno Devi Katra	813,707
Chak Rakhwal	710.464
Udhampur	660.053
Ramnagar	580.333
Manwal	491.782
Sangar	450.197
Bajalta	340.822
Jammu Tawi	343.763

Shahabad' railway station became the highest railway station of Indian Railways' broad gauge. The highest railway station among the broad gauge railway stations, from the year 1964 till the start of trains in Kashmir Valley Railway, was 'Shimliguda' railway station situated in KK line of East Coast Railway. Its height is 996 meter. When the railway line was built at a high altitude in Jammu & Kashmir, a total of 15 railway stations came at a higher altitude than Shimlaguda. When the first train ran in Anantnag on 11th October, 2008. After this, the railway station built at the highest altitude became Qazigund railway station of Kashmir Valley Railway, whose height is 1722.165 meter. Qazigund got this status when the first train was run from here on 28th October 2009. Qazigund lost this first position when on 28 December 2012, the next train of this section was run from Pirpanjal railway tunnel. This train was a trial run train. Six months later, i.e. from 26th June 2013, when a new train started on this section, 'Hiller Shahabad' railway became the highest railway station of Indian Railways. Whereas Qazigund's position came to second place. The height of Hiller Shahabad station is 1753.922 meters. This railway station is near Qazigund and falls in Qazigund and Banihal railway section. Pir Panjal Railway Tunnel starts from Hiller Shahabad Station and is built till Banihal Station. Pir Panjal Railway Tunnel is also called Banihal Railway Tunnel because it is located near Banihal Station. It is called Pir Panjal Railway Tunnel because of the Pir Panjal mountain range. Banihal Railway Station located near this tunnel is also a very high railway station, whose height is 1705.928 meter. Actually, Pir Panjal mountainous region is at a very high altitude. Whose average height is 1760 meter. Due to this, the railway line and railway stations built in this area are located at a very high altitude. However, among all the four types of railway stations (two types of narrow gauge, meter gauge and broad gauge), the highest railway station in Indian Railways is 'Ghoom' station. Whose record is not going to be broken even in the near future.

Thus, this new record of Kashmir Valley Railway in Indian Railways, the highest and newest railway station of Indian Railways on broad gauge line 'Hiller Shahabad' station is an interesting and proud record for railway lovers.

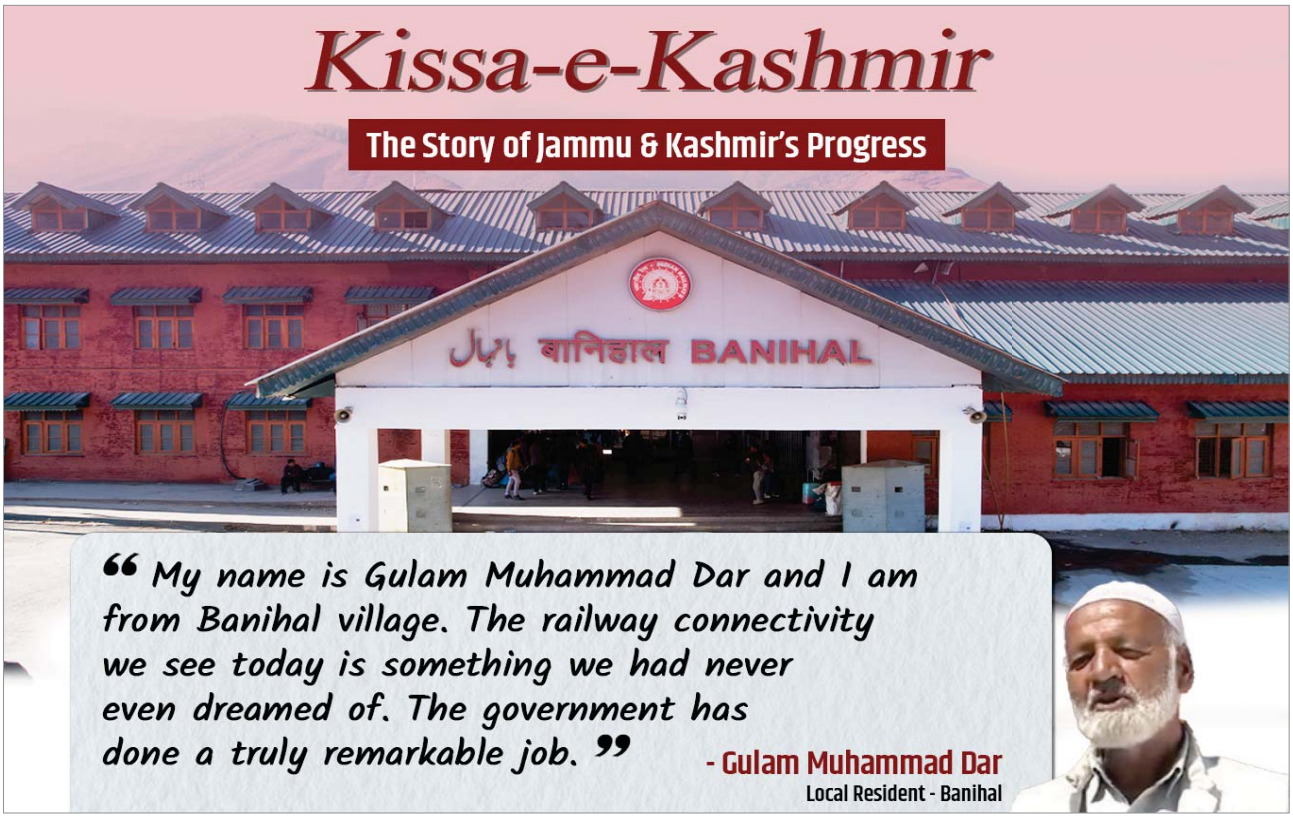
As far as the country's highest railway station on the broad gauge line is concerned, except the Kashmir Valley Railway (from Jammu to Baram La), the highest railway station in Karnataka is Chikmanglur Railway Station but it is not very

famous. The height of Chikmanglur station is 1009.845 meter. Thus, if we exclude the Kashmir Valley Railway, this is the highest station on the broad gauge line of Indian Railways. This station was opened on 19th November, 2013. In a way, it can be said that after Shimlaguda, this station represents the highest railway station on the broad gauge line of the country.

23 Railway Stations, Whose Height is More Than 1000 Meter above Sea Level

All stations have their own height from the sea level, which is called the average height from the sea level or Mean sea level. This height gives information about the height of that station. Naturally, the stations which are built on hills or mountains will have a higher height and the stations which are built on the sea shore will have a very low height. The height is measured from the sea water because the level of sea water is the same all over the world. Out of the stations built in the Kashmir valley, the height of 23 railway stations is more than 1000 meter, whereas only three stations out of these are less than 1500 meter. This means that the height of 20 stations is more than 1500 meter. If seen this way, then these 23 stations of the broad gauge are the

highest and after that, except Kashmir Railway, the highest of the rest of the country's railway station is Chikmagalur Railway station at 24th place and Shimlaguda at 25th place. Since no railway line is being built at a higher altitude in the near future, all these records are not going to be broken for the next decade. Even the newly built railway line Rangpo station and Himachal Bilaspur railway station will not be able to break all these records. This record of Kashmir Valley Railway will be broken only when the railway line will be built in Leh. In this way, this record of the height of the stations of Kashmir Valley Railway is an amazing record in itself.



EXPERIENCE EXTREME ENGINEERING: ANJI KHAD CABLE STAY BRIDGE

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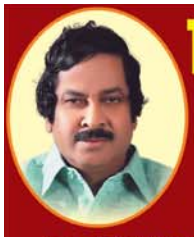

The Railway Employees' Co-operative Credit Society Limited,

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  - Personal Accident Coverage Scheme
  - Education Award
- Personal Accident Coverage of Rs. 10 Lakhs :
  You are covered under Personal Accident Coverage Scheme of the Society, for a Sum of Rs.10 Lakhs, subject to the rules and regulations governing the same. In the event of loss of organs, arising out of an accident, then compensation ranging from Rs.10 Thousand to Rs.10 Lakhs will be paid, depending upon the loss of organs and or earning capacity, as per the Rules of the Insurance Company, MV Act and IRDA Rules.
- Please note that, in case of any accident, intimation should be given to the society, **within 24 hours, from the time and date of such occurrence** and in any case, not later than three days, from the date of occurrence, failing which, no claim shall be entertained.
- All Welfare Schemes are subject to the Rules and Regulations applicable for each such Scheme/s, Bye Laws of the Society, as per MSCS Act 2002 and its rules and other relevant laws.
- Suicide and Accidents / Incidents, occurring on account of Consumption of Alcohol / Drugs / Intoxicants / Violation of Laws are NOT COVERED, under any of the Welfare Schemes.
- Conditions as per the Bye-Law, rules and regulations framed by the Board of Directors, as existing and as may be amended from time to time, shall apply. All disputes / issues are covered under the provisions of MSCS Act & Rules 2002, Bye-Laws of the Society and are under Chennai Jurisdiction only.

Under the 4 Welfare Schemes, as on 31.03.2025

Rs. 176.39 Crores

have been paid to

20,533 Members, Member's Families and Sureties

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All our Branches are Computerised, Loan Applications received upto 12.00 noon at the branches will be processed and the payment will be arranged on the following day itself, subject to eligibility. All loans, Schemes etc., are as per the rules, regulations, Byelaws and MSCS Act 2002.

For the benefit of our Members, the Society has made arrangements for using *"WhatsApp"*. Add the following Numbers, 9344877273, 7824820162, in your Contact List, so that, *"WhatsApp Groups"* of our Members, can be created and information from the Society, is directly passed on to you. Facility also exists for the Members, to directly contact the Headquarters of the Society, through *"Zoom App"*. Hence, it is suggested that, the *"Zoom App"* may be downloaded, in your Mobile Phone, so that the Society can send a Link, for direct Video Call, as and when required.

For enquiry Contact

08148387240, 08148387241, 08148387242, 07418148957

N. MANIVANNAN
Chief Executive

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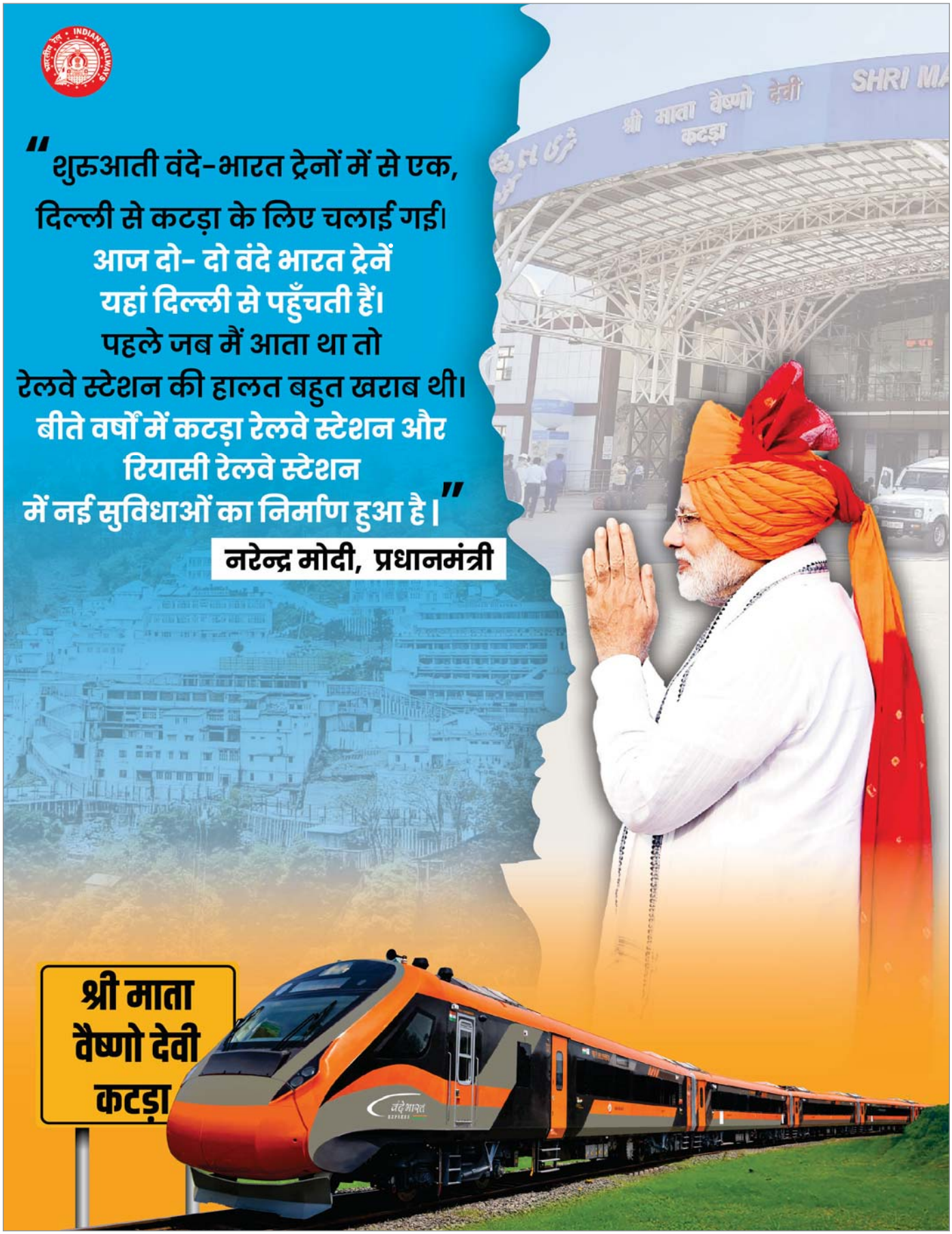

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