

December 2022 Edition



# ANALYSIS REPORT ON INDIA'S ROPEWAY SECTOR



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Transport is the lifeline to connecting people from the farthest corner and thus the development of an efficient transport network in the remotest part of the country is necessary for its economic and social growth. But, in the difficult hilly terrains providing a safe and efficient transport network is a challenge that restricts the regional growth and limits the livelihood opportunities of its people.

Here, the ropeways are present as one of the best alternatives in comparison to traditional roads and railways which are difficult to operate due to uneven terrain. People in India are not unfamiliar with these ropeways as the Mussorie ropeway which is one of the biggest tourist points was the first of its kind developed in 1981. But still, their use as a primary mode of transportation is not well accepted and thus it became only a part of tourist excursions on hilly areas and difficult terrains as an alternative to trekking.

In India Gulmarg Gondola, bagging the badge of the world's second and Asia's highest cable car to cover an altitude of 13,400 ft attracts several tourists around the year, Besides this some of the other following famous ropeways operating in different parts of the countryare :

S. No.	Ropeway	State/UT	Specifications
1	Gulmarg Gondola Cable Car, Jammu <sup>10</sup>	Jammu	Situated at 2730m height, <sup>11</sup> Covers a distance of 2.5km, <sup>12</sup>
2	Bi-cable Zip-back Ropeway, Gangtok <sup>13</sup>	Sikkim	Situated at 1676m height; Covers 1km distance; 7 minute ride
3	Mansapurna Karni Mata Ropeway, Udaipur <sup>14</sup>	Rajasthan	4 minute ride <sup>15</sup>
4	Aerial Ropeway, Nainital <sup>16</sup>	Uttarakhand	Situated at 2,270m height; Take 151.7 seconds to reach <sup>17</sup>

Source: <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2022/feb/doc202221516101.pdf>

However, the last two decades have seen a wide application of ropeways for transport, tourism and commercial purposes that have provided thrust to the growth of the industry unprecedentedly. It works for providing a convenient, and safe alternative for the commutation needs of the general local public. But the industry also faces many tests as these areas have limited space and need special technical expertise to execute the projects and operate further with continuous maintenance.



Hence, for its mass-level acceptance and with the intent to develop ropeways as an alternate mobility solution, the Government of India under the Union Budget 2022-23 has announced the National Ropeways Development Programme named "Parvatmala". Under this, preferential ecologically sustainable routes will be identified in the hilly areas for the development of ropeways where conventional road transport cannot be managed to connect the region with other parts of the country.

Being a preferred alternative mobility solution in the future, the feasibility of their operation and development in congested urban areas are also been envisaged by the government. It is unwinding enormous possibilities of growth in the sector with the growing commutation needs and rising congestion on India's urban transport infrastructure.

Thus, it is no doubt one of the possible solutions to answer India's traffic woes cost-effectively and play the role of a central asset in accelerating the growth of the tourism and hospitality industry in a sustainable and environment-friendly way. Along with its wide use in hilly and difficult terrains, it also has the potential to work as a public transport system on the most congested roads of India in Delhi NCR, Bangalore, Mumbai, etc in the form of Urban Gondolas or Aerial cable systems soon.



The Ropeway is an efficient, safe, and economical mode of transportation for people and materials in hilly and remote areas. These moving cars operating on cables are frequently used while working in mines, and mountains other than as tourism services. The Ropeway Development in India is regulated by the Ministry of Road Transport and Highways (MoRTH).

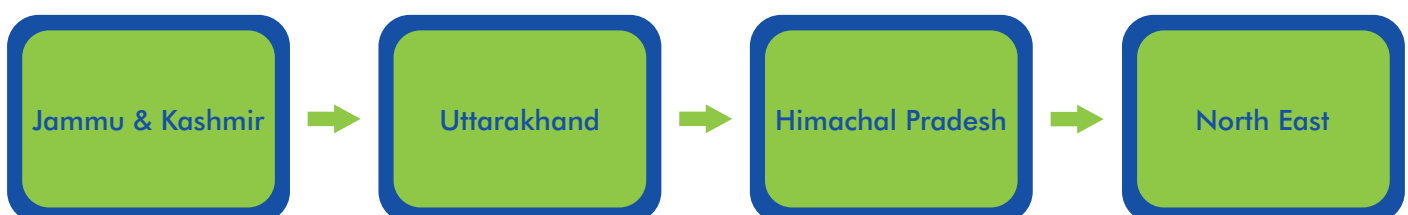
The ministry has been made responsible for ropeway development in the country through an amendment in the Government of India (Allocation of Business) Rules 1961 in February 2021. Hence, it is working to formulate an institutional, financial and regulatory framework for its seamless operation.

The development of ropeways in India is taking place under the Public Private Partnership (PPP) model for better connectivity and convenience along with the promotion of various opportunities for tourism and livelihood. It will also be developed as an efficient mass transit mobility solution in India's congested roads and is expected to operate as cable taxis as an alternative to costlier and less green urban road transportation choices.

The "Parvatmala" scheme will help in attracting more tourists to India's remote and hilly areas through the construction of eight ropeway projects covering the 60km area in the current financial year 2022-23. The development will take place on the routes where the development of highways and roads is impractical due to technical or natural reasons.



Besides this, helping people in these regions to live their life easily and find new possibilities of livelihood, the ropeway development is also able to attract tourists and travellers in large numbers in these steep and hilly terrains. The scheme is currently working on projects in the following Indian states:



This will be helpful to strengthen the connectivity of India's border villages with the big cities and work positively for the security of the country. The ropeway transportation in these strategic areas will provide a safe, practical, and convenient mode of commutation for their daily personal and commercial needs along with defense-related uses in time of need.

Ropeways are already part of many Indian tourist places such as Nainital, Guwahati, Gujarat and Rajasthan. The government is working on many other projects in the regions such as Ibudhou Majing in Imphal, Kedarnath and Hem Kund Sahib in Uttarakhand. The Timer Trail Resort in Parwanoo, Himachal Pradesh is one of the major tourist attractions which runs from hill to hill and brings a breathtaking scenic experience to life.

In these ropeway constructions, the single power plant is used to propel multiple cable cars and thus proved to be economical in operation, and maintenance. This can also transport perishable agriculture products in less time to the markets in the absence of quality road infrastructure from the villages in hilly and valley districts to get better prices for their products.

In this regard, the Indian Port Rail & Ropeway Corporation Ltd (IPRCL) is also helping the government to build up capacity and offering a wide range of consultancy through traffic study, suitable locations for stations, ropeway alignment based on topographic inputs and traffic study, cost estimation, financial analysis, along with statutory clearance. Some of the basic services provided by the IPRCL in the development of ropeway infrastructure in the country are as under:

Preparation of Feasibility Report

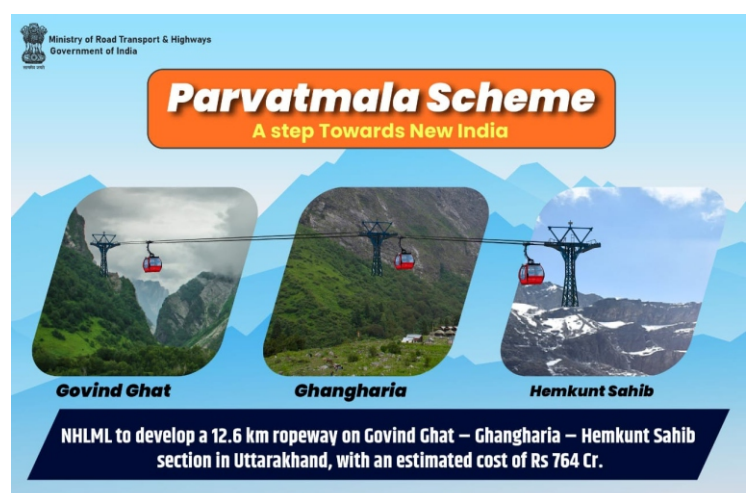
Preparation of Detailed Project Reports

Bid Process Management

Project Management and Execution consultancy

Independent Engineer and Safety Certification

The use of cable cars as mass transit systems on congested roads in Urban India is still not explored on the ground. In this regard, the PPP model has been explored for 35-50 years build-own-operate model to attract investments from private players. The ministry is also in bilateral talks with foreign delegations to discuss future potential collaboration in the field of ropeway development to make world-class tourism and transportation infrastructure in the country.

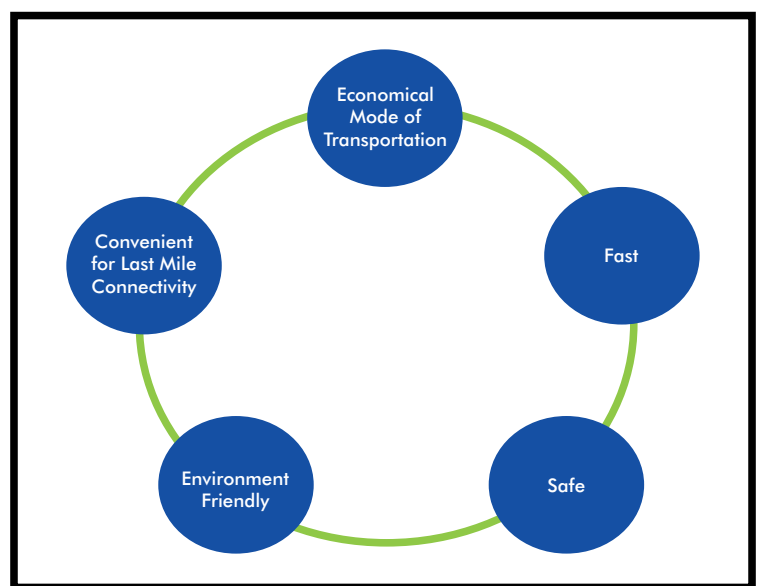




In a large polluted country like India, the transportation sector needs to evolve rapidly to cater to the rising demand of commuters in a safe, convenient and economical way. This becomes more challenging due to varying terrains and geographical topographies across the country. In this regard, the ropeway development promises to fulfill all these requirements on these varying terrains and congested urban areas.

Thus, India has multiple reasons for the growth of the ropeway industry including providing sustainable environment-friendly solutions for the transportation needs of people and materials. Some of such important growth drivers that are providing the breeding ground to flourish the industry in the country are as under:

In the hilly terrains, where livelihood opportunities are limited and terrains are hard to cover, the ropeways work as an economical mode of transportation of people or goods from one place to another for their personal and commercial requirements. Their lower land acquisition cost, make it a preferred choice as they offer a low construction cost per km in comparison to roadways. The aerial mode in absence of unregulated traffic works faster and carries more people in one go and there of increasing its cost-effectiveness further.



But still, the comprehensive feasibility study of the ropeway projects is an important criterion for its better operation and management. Because it can pose a serious threat to the mountain topography if goes wrong. Its exhaustive use without a detailed feasibility study can bring major damage to India's natural paradises and historically important sites.



The cumulative assessment of vibration impact, waste generation due to an increased traveller and tourist footfall, risk evaluation and impact of these ropeway projects on the local ecology, wildlife and livelihood opportunities need to be weighed beforehand. A clear regulatory policy framework can make better use of this efficient mode of transportation for accelerated economic growth of regions and their natural environment.

The government push through the "parvatmala" scheme has accelerated the growth of Ropeway infrastructure in the country to provide time and cost-efficient travelling experience in hilly and congested urban areas as an alternative to conventional roadways. Ropeways travel ariel distances and thus take less transportation time. This mode of transportation generates low carbon and dust emissions that rules out the possibility of the soiling of the environment at large.

The ropeway infrastructure can cross any difficult terrain such as rivers, hills, valleys and buildings and thus pose minimum barriers to the environment, humans, flora, or fauna. But, this enables them to travel fast and economically to better manage their life and livelihood in difficult terrains. Some of the important advantages extended by the ropeway development across the country including the remote border villages are as under:

1

**Ideal for Difficult and Steepy Terrains**

2

**Economy**

3

**Flexible**

4

**Enable Mobility for Local People**

5

**Able to Operate in Large Slopes**

6

**Low Use of Land and Human Resource**

7

**Low Carbon Footprint**

The ropeway development with 3S or equivalent technologies works best to transport 6000-8000 passengers every hour and proves to be one of the best economical solutions for last-mile connectivity in remote areas. As they can be propelled through a single power plant with a single operator, their operational and maintenance costs are also less in comparison to railways as mass transit systems.

The growth of the sector has also been suggested in places where land use is highly restricted and has intense competition. As this transportation medium needs only narrow-based vertical supports in specified intervals, thus needs a limited area of operation as compared to road and rail networks to provide the best suitable alternatives under such circumstances.

But still, this promising mode of transportation has its associated challenges which need to be addressed by the government and other primary stakeholders to reap its numerous benefits for people and the economy of the country:

01

Can Disturb Fragile Mountain Ecosystem

02

Change in Topography and Drainage Pattern

03

Threats due to Increased Footfalls

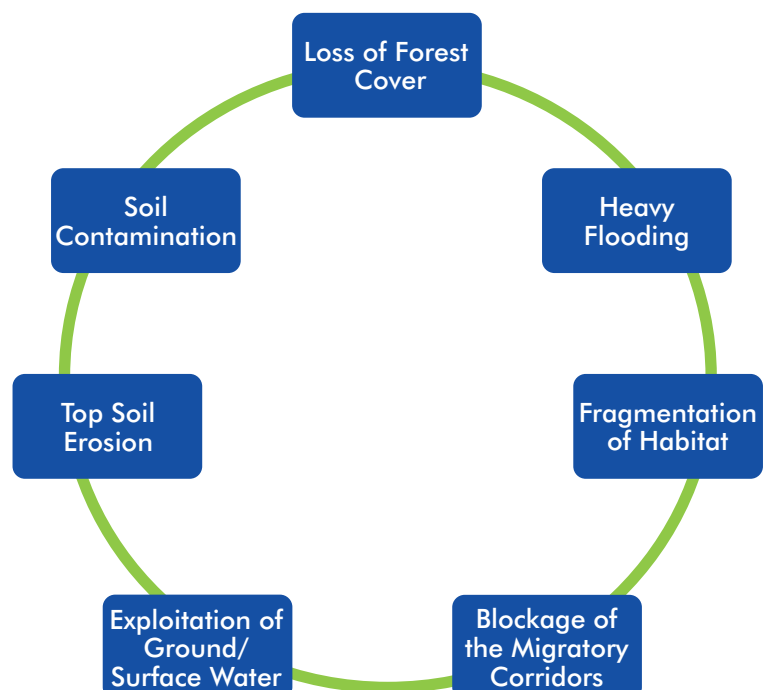
04

Lack of Detailed Feasibility Study

05

Periodic Maintenance, Repair and Renewal

As the topographical and drainage pattern change can cause serious threats to the fragile ecosystem of these mountains such as the Himalayan range. It can develop the following impacts that can disturb the natural wild ecology and environment in these regions:



For this purpose, the Environment Impact Assessment (EIA) guidance manual has been prepared by the Ministry of Environment & Forest for the aerial ropeway development in the country. This works as a torch bearer for ropeway projects and helps in preparing detailed feasibility, technical, and environmental studies to take further action before construction.



As a risk assessment measure, the EIA manual has listed the following natural and technical failures encountered during their operation and the need for prevention through suggestive actions.

Reason	Prevention	Action required to be taken
Socketing failure	Proper material used, design of socket and periodic inspection	Maintenance guidelines to be followed regularly
Splicing failure	Periodic inspection	Training manpower, tools and tackles
Fall/slippage of cabin (Grip failure, Hanger failure, failure of joints, overloading)	Components to be replaced as per life cycles	Replacement at proper time intervals to be done
Cabin door opening (collisions, jerking, failure)	Simple precaution like locking before leaving, cabin follow rules	Seat fasteners for seats to prevent falling of passengers
Mount assembly parts failure, tower failure (rusting, over-usage, deterioration, natural calamity)	Continuous monitoring, life cycle of components to be ascertained	Life cycle monitoring
to check for fatigue or corrosion of the anchor bolts on a sample tower	whether a continuous uphill load imposed by the subtended angle of the haul rope on any vertical tower might lead to excessive fluctuating loads on the anchor bolts;	Prevent water retention and resultant corrosion
Hitting of cabin (Improper demarcation of area, improper passenger management)	Proper signage, proper demarcation and cordoning of cabin, training of operators	Training of operators, proper maintenance
Electrocution (Lighting)	Proper rope earthing	Periodic monitoring
Entanglement of cabin (High wind, breakage of catenary wire)	Install and monitor Wind speed,	Periodic inspection of catenary wire, monitoring condition of wires
Natural causes like earthquakes, landslides, wind storm, hailstorm, flood, jungle fire	Earthquake resistant constructions, proper retention of landslide prone areas, early warning systems	Early warning systems

Source: [http://environmentclearance.nic.in/writereaddata/form-1a/homelinks/arial%20ropeway\\_May-10.pdf](http://environmentclearance.nic.in/writereaddata/form-1a/homelinks/arial%20ropeway_May-10.pdf)

Thus, utmost care is important to take up the ropeway project in the fragile ecosystem and the government should ensure strict adherence to the guidelines under the projects while passing the ecologically sensitive areas such as forest reserves, wildlife centuries, etc. In 1998, the ropeway development in Nepal caused serious damage to its then-existing drainage pattern and caused heavy flooding and erosion. It caused much worse than good from the ropeway construction for the nation in consecutive monsoons.

Thus, it is very important to follow the risk assessment guidelines concerning regular maintenance and strict adherence to fire safety, mechanical, and electrical operational issues at regular time intervals. Also, complete adherence to guiding manuals should be ensured to avoid the unseen losses of life, ecology and the environment as a whole.

The Union Budget 2022-23 has raised hopes of the ropeway industry in India through the “Parvatmala Scheme”. The scheme has encouraged the ropeway development in the country at an unprecedented pace and lifted the expectation of private players for a better return on their investments. As the scheme is set to work on the ropeway projects to provide an alternative mass transit solution across the busy urban roads also which was earlier restricted to only hilly and difficult terrains.

The move has opened the treasure of unmatched opportunities in the sector as the rising congestion due to increasing personal vehicles in Urban India is increasing day by day. Thus, the use of ropeway development as an alternative mode of urban mass transportation brings economy of scale in the industry for the stakeholders along with public investment poured by the government for the same.

In this regard, the MoU signed between the National Highways Logistics Management Limited (NHLML) and the State Government of Himachal Pradesh is going to provide a world-class experience to tourists in the coming years. The 7 ropeway projects will attract a total investment of Rs 3,232 crores and provide safe, scenic, and eco-friendly tourist attractions in the state.

Besides this, the IPRCL is also set to invest in more than 40 ropeway development projects across the country with an investment of more than Rs 3000 crores in which Dehradun City Urban Ropeway Project in Uttarakhand, Mumbai- Elephanta Ropeway in Maharashtra, Film City-Jewar Airport project in U.P. are some of the important ones. These projects will not only help the tourism industry but will also provide seamless congestion-free commutation to daily commuters.

Along with these developments, the bilateral talk between the Government of India and French industrialists has also opened opportunities for collaborations in the field related to advance technologies on the optimal cost of development to bring down the investment cost under PPP mode is also motivating.

However, global cooperation from the US, Europe and Austria has also given a major push to sustainable tourism and alternative urban mobility solution through ropeway development in the country. This will in near future change the transportation and travel dynamics in India in an eco-friendly way that will also reduce India's dependence on fossil fuels used in the traditional mass transit systems with a significant decrease in travel time.



MoU Signed Between NHLML And State Government For Construction Of Ropeways In Himachal Pradesh

India has seen exponential growth in its infrastructure in the last few years. It ranges from the remotest place to the strategic one and thus strengthened India's security as well as social and economical growth without any bias or regional disparity. This is also evident in the case of ropeway development in the country, as before 2018 the ropeways are only serving the purpose of the tourism industry and have been counted as an alternative mode of transportation restricted to Himachal Pradesh, Uttarakhand and Northeastern states mainly.

But In 2018, when India's apex think-tank, Niti Aayog released a draft of the Public Private Partnership Agreement Framework to guide the design and implementation of ropeway development across the Indian states, the scenario has been changed. Since it has been working as a torch bearer in the risk assessment for both the stakeholder along with the safety and affordability of the ropeway services to the passengers.

The launch of the National Ropeway Development Programme- "Parvatmala" under the Ministry of Road Transport and Highways in the Union Budget 2022-23 was also suggested through a study made by the MoRTH in association with McKinsey & Co. It urged the need for a national program for ropeway development in the country much like the "Bharatmala" program.

The projects under the scheme have been initiated through PPP mode and will be completed under the set guidelines. It will also include ropeway development in India's congested urban areas like Delhi NCR, Varanasi, etc. It will provide an alternate efficient and ecologically sustainable mass transit system for a large number of passengers and prove to be a boon for the last mile connectivities.



The ropeway projects in northeastern states will also receive additional financial support through the Prime Minister's Development Initiative for the Northeast (PM-DevINE) scheme. It will not only improve the infrastructure and connectivity in the region but also help local people to go far for their livelihood opportunities. This will also enable the youth and women community in these areas to engage in employment activities and support the region's economic and social growth and help in mitigating climate change concerns.



The enthusiastic response from stakeholders including the government and private players is welcoming to the industry and set high hopes for the future to provide a low-energy and low-cost solution to India's commutation needs on difficult terrains and congested urban Indian roads.

Its use as a primary mode of the mass transit system in India will pave the way for pollution-free, speed travel for the daily commuters in the metro cities like Delhi, Bengaluru and Mumbai and make it a viable model ready to replicate in various other parts of the country facing the issues of pollution and congestion in near future.

Soon cable cars are going to be a general view in India but, their mass-level use still needs to take time. As this works as a quality commutation service in urban areas and will work as a luxury due to the high service fare. But surely it will help the government to kick start the future of mass mobility transition in the country and achieve their targets related to climate change through balanced regional growth.





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