

Emerging Trends & Issues in Roads and Highways in India

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Abstract: *The aim of the paper is to emphasize on the emerging trends, growth and issues of the road sector. It covers various pertinent issues, trends, role of PPP model and expected future focus areas in the roads and highway sector. As India has the second largest road network in the world. Road construction and award trends in recent years also give optimism of achieving such high targets. Focus continues to be on Bharatmala Pariyojana, with added stress on multimodal integration, road safety, increasing use of Information Technology (IT) applications, augmentation of existing funding sources and emphasis on green initiatives. Many issues have been plaguing the roads and highways sector in like land acquisition, streamlined operations, financing, operation and maintenance (O&M) and the revival of languishing projects. The government has been taking a number of initiatives to solve the various issues such as operational initiatives like process streamlining and various technological initiatives to increase operational efficiencies, measures to revise languishing projects like equity divestment, one-time fund infusion, amicable dispute resolution and other initiatives like continuous evolution of PPP mode. Highway development for bridging the infrastructure gap is likely to be over in the future and development/construction activities can reduce progressively. This paper identifies that a shift is expected from highway construction/ development to providing the quality service to various highway users by enhancing the use of technological applications, adoption of safety solutions, promotion of sustainability trends and augmenting existing source of finances. This shift has led to the emerging trends in roads and highways sector in India and is expected to resolve the issues in the coming future.*

Keywords: Roads and Highways, Bharatmala Pariyojna, Public Private Partnership (PPP), Build Operate Transfer (BOT).

1. Introduction

Roads are an integral part of the transportation system. They play a major role in achieving national development and contribute to the overall performance and performance of the society. They carry about 65% of goods and 85% of passenger traffic in India [3]. It is estimated that traffic on the road is growing at 7-10% per year. Of all the types of roads, highways connecting different parts of the country are considered the most important. For example, National Highways (NH), makes up only about 2% of the road, but holds about 40% of the road traffic [1]. Roads and highways are considered to be the major sector in infrastructure and economic development. Besides, to provide mobility to the people, they provide the infrastructure needed for the continuation of goods and services so that their supply can be met with the demand.

2. Development in India (Background)

India has the second largest road network in the world at 58.98 lakh km. Out of this around 1.4 lakh km are National Highways (NHs). Significantly, NHs constitute around 2% of the total road network in the country but carry about 40% of the road traffic. The density of India's highway network at 142.7 km of roads per square kilometer of land – is like that of the United States (65) and much greater than China's (42.8) or Brazil's (18.6) [2].

The National Highways Development Project (NHDP) in the context of NH's is near to the completion-in seven phases. Later, on the other highway development programmes like Special accelerated road development Programme for

Development of Road Network in the North Eastern States (SARDP-NE), and the National Highways Interconnectivity Improvement Project (NHIP) were also taken up by the Ministry of Road Transport and Highways (MoRTH). Further, the Bharatmala Pariyojana is currently ongoing. For majority of the projects under NHDP and Bharatmala Pariyojana, National Highways Authority of India (NHAI) is the implementation agency. Other NH related programmes/ works are being implemented through agencies like National Highways Infrastructure Development Corporation Ltd (NHIDCL), State Public Works Department (PWD)s, State Road Development Corporations and the Border Roads Organisation (BRO) [4].

Roads in the jurisdiction of state governments are under different categories like State Highways (SHs) and Major District Roads (MDRs). They are being developed/upgraded through State PWDs and State Road Development Corporations. Pradhan Mantri Gram Sadak Yojana (PMGSY) is being implemented for rural roads through the Ministry of Rural Affairs with active participation by state governments. Further, roads within urban areas are mostly with Public Works Department (PWDs) and Urban Local Bodies (ULB)s.

State Governments have a significant role to play in ensuring connectivity beyond NHs – development of Non-NH roads like SH, MDR, Other District Roads (ODRs), ensuring last mile connectivity, providing strategic locations for logistic facilities and passenger transport amenities. States have varying levels of maturity in terms of road infrastructure development [4].

Issues plaguing state governments include adequate identification and prioritisation of projects, funding shortfall in project execution, limited institutional capacity to implement projects and absence of adequate tolling guidelines and policies. In addition to budgets, multilateral funding has been assisting the state governments to facilitate institutional capacity building, providing Project Management Consultancy (PMC) services, supervision support and public transport and logistics facilities enhancement measures over and above road project development. MoRTH is planning to construct around 60,000 km of National Highways in the next five years. This underlines the importance of roads and highways development in India. A major reason is that in addition to being a major carrier for passenger traffic, roads and highways also play a key role in carrying freight across the country. The share of roads in freight transport is approximately 60%.

3. Trends

The focus of the sector is not only on efficient award and construction of roads, but also on smooth movement of passenger and freight through enhanced logistics efficiency. This has been the guiding principle behind Bharatmala Pariyojana.

a) Bharatmala Pariyojana Programme

Approval of the major highway sector programme Bharatmala Pariyojana Phase I by the Cabinet in October 2017 reiterated the focus is on optimising efficiency of freight and passenger movement across the country. Under Bharatmala Phase -I, development/upgradation of 34,800 km of NHs is envisaged over a five-year period (2017-18 to 2021-22) at an outlay of INR5,35,000 crore [5]. Upto October 2018, 6,407 km of roads had been awarded under the Bharatmala Pariyojana [3].

b) Implementation of important projects and Expressways

A number of important projects have been taken up in recent years. Few of the important ones are:

Char Dham Mahamarg Vikas Pariyojana: Project envisages development of easy access to the four dhams in India -Gangotri, Yamunotri, Kedarnath and Badrinath. Development of 889 km of roads is expected at an estimated cost of INR12,000 crore [5].

- **Setu Bharatam:** This project aims to replace level crossings on NHs with Roads Over Bridges/Roads Under Bridges. This aims to construct 174 such structures [3].
- **Eastern peripheral and western peripheral expressway:** These two projects connect NH-1 and NH-2 from western and eastern side of Delhi. Other such important expressways taken up for construction are Delhi-Meerut Expressway, Vadodara-Mumbai Expressway, Delhi – Mumbai Expressway, Bangalore-Chennai Expressway, etc [3].

c) Road Transport - focus on smooth traffic movement and enhancement of logistics efficiency through multi-modal integration

Road transport is vital to India's economy. India's road network carries more than 60% of its freight and about 85% of passenger traffic. Our growing economy has witnessed a rise in demand for transport infrastructure and services. Passenger transport is gaining more significance - increasing mobility needs of the Indian population due to enhanced urbanisation and need to move more for livelihood, education, healthcare, fulfilment of social needs etc. Requirements are improved public transport facilities through enhancement of physical infrastructure and rolling stock, operational efficiency and enhanced passenger facilities including safety and information availability [2].

In today's scenario of high road congestion, and increasing pollution, the focus is shifting towards increasing use of public transportation. Important considerations are seamless integration of multimodal options, first and last mile connectivity, integrated technology solutions enabled ticketing, enhanced passenger safety and information availability. Freight transportation in the country is predominantly road based. More than 60 per cent of total freight transportation is carried out by roads. Major issues include high logistics cost— around 14% of the nation's GDP as against 8-9% for developed nations, existing logistics inefficiencies - delays in inter- state border crossing, manual toll collection, non-availability of bypasses for busy urban stretches and integrated logistics facilities like Multi Modal Logistics Parks.

A number of measures have been undertaken to ensure easy and economic passenger and freight movement in recent years. Some of such measures are revision of axle weight to bring down logistics cost, launch of ranking systems for toll plazas, revision in maximum speed of vehicles, encouraging development of Multi Modal Logistic Parks (MMLPs) and Inter modal stations for passenger transport.

d) Focus on Road Safety

Road safety has been taken up as a priority. A number of initiatives have been taken regarding this, such as black spots rectification, setting up driver training institutes, SukhadYatra app and toll-free emergency number, capacity building of officers, etc. Training has been conducted for NHAI field officers, concessionaires, consultants, contractors, etc. Road safety audit is mandatory in all NHAI projects through independent safety consultants [5].

e) Increasing use of Information Technology (IT) applications

IT applications are being progressively mainstreamed in all aspects of the road sector. A number of IT applications have been developed to aid on ground operations. Some major IT applications are; use of Electronic Toll Collection (ETC), development of Bidder Information Management System, Bhoomirashi, etc. MoRTH, NHAI and NHIDCL have also adopted an e-procuring and e-tendering system for procurement of goods and services. A mobile application system has also been launched for tag purchases and top up of FASTags called MyFASTag [3].

f) Initiatives related to augmentation of existing funding sources

There is a gap between the actual funding required in the sector, and the funding which has been incoming in the sector. This funding gap needs to be reduced by exploring alternate sources of financing. A number of options have been taken in this direction such as raising capital from Life Insurance Corporation, Employee Provident Fund Association and issuing rupee-denominated masala bonds in the London Stock Exchange. Asset monetisation models like Toll-Operate-Transfer (TOT) for the maintenance of roads have already been implemented [3]. Infrastructure Investment Trusts (InvITs) and securitisation of toll revenue are also being explored by NHAI.

g) Emphasis on green initiatives

A number of green initiatives have also been taken up in recent years to check the issue of environment pollution. Battery operated vehicles, and vehicles driven on methanol and ethanol have been exempted from permit. A Green Highway Division has been set up by NHAI to carry out plantations along highways and medians. A number of initiatives have been taken in Union Budget 2019-20 to encourage adoption of electric vehicles (EVs), such as reduction of GST on EVs and tax benefits for buying an EV [3].

4. Role of PPP in Sector

In the early period, roads and highways were completely built by the government departments and agencies (of both Centre and State) using their funds for several decades. This arrangement gave limited results and was fraught with several operational and budgetary issues. The opening up of roads to the private sector began with highway development upon the establishment of NHAI. Although the NHDP Phase I and II were publicly financed through fuel cess and federal grants and used a traditional contracting model, it was undertaken in PPP mode after NHDP Phase III. Essentially, the grant financing model was replaced by the revenue model based on toll collections to finance highway projects [2].

The incentives for attracting the private sector into the road sector were followed by the adoption of various models that encouraged PPP, which provided a means of accelerating private sector participation. PPPs have become an important means of investment inflows and project execution across all sectors and the Government of India has formulated a national PPP policy in 2001 to further emphasize its role. Further the government has come out the grant fund support of otherwise feasible projects through Viability Grant Fund and Special grants for Project closure. Below are listed types of road contracts PPP-

- Design – Build
- Management Contracts
- Annuity Contracts
- Design-Build-Operate-Maintain (DBOM)
- Design-Build-Finance-Operate (DBFO)
- Build-Operate-Transfer (BOT)
- Build-Transfer-Operate (BTO)
- Build-Own-Operate (BOO)

- Joint Development Agreement (Primarily China)
- Concessions
- Asset Sales

5. Sectoral Issues

Road transportation in India faces a number of problems. Keeping in view the vastness of the dimensions of the country, her physiographic, her unlimited natural resources and the fast-growing passenger and freight traffic, the inadequacy of the road network is quite glaring.

A. Financing Issues

At initial stages of project development, the first issue arrives of land acquisition which increased more than 30 per cent since 2017 primarily due to enhanced compensation payment requirements as per 'The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act'. In addition to this, current project implementation modes like EPC and HAM put high stress on government resources, thus limiting the number of projects than can be taken up at one go [1].

There is a lower appetite for private developers to absorb construction risk as well as traffic risk based on legacies – e.g. languishing projects and projects needing premium payment deferment. Road sector projects are increasingly facing financial closure issues. Reasons include wariness of banks to lend, high share of NPAs, asset liability mismatch and banks reaching infrastructure lending caps. There is uncertainty on equity returns in existing operational PPP projects along with difficulties faced in servicing debt. This is due to uncertainty of toll revenue collection and variation of collected toll revenue compared to projected levels. This discourages private sector interest. The increase in O&M costs are also affecting the project returns [1].

B. Operational Issues

Delays in pre-construction activities (such as land acquisition, relocation) is affecting project timelines. These processes consume considerable time. Land acquisition for road projects involve various stages. Each stage involves a number of stakeholders and regulatory bodies. The completion depends on other factors like geographical location and hence, the process is challenging. Inadequate technical due diligence at the time of preparation of Detailed Project Report (DPR) can also lead to high project costs due to aspects like sub-optimal alignments leading to enhancement in construction cost [1].

Road development process requires a number of approvals such as environmental clearance, forest clearance, railways clearance, etc. Each of these activities take considerable time and non-adherence to timelines result in cost overruns due to delays. In addition, other factors like enforcement issues and lack of construction material also result in delays. Managing problems of sub-contractors and holding them accountable is also a major issue faced. Sub-contractors also face payment issues. Often unforeseen weather conditions require unplanned O&M, over and above the routine and periodic maintenance activities. This results in enhanced O&M expenses. In addition to this, there is a general lack of road user facilities. Safety related issues are

also observed on many road stretches such as high accident response times [1].

C. Other Issues

All state government authorized projects are not backed by a state support agreement, which results in low interest in such projects. Claims arising out of disputes between the concessionaire/ contractor and the government authorities is also a significant cost which can lead to large liabilities. The returns on projects is not up to expectations because of improper DPR and traffic reports in the feasibility stage. Actual traffic is much less than the anticipated traffic, and so the lower returns deeply affects the financials of the project. Arbitration issues also result in project delays, which cause cost and time overruns [2].

6. Conclusion

Many issues have been plaguing the roads and highways sector in India like land acquisition, streamlined operations, financing, operation and maintenance (O&M) and the revival of languishing projects. The government has been taking a number of initiatives to solve the various issues. These are in the form of operational initiatives like process streamlining and various technological initiatives to increase operational efficiencies, measures to revise languishing projects like equity divestment, premium deferment and one-time fund infusion, amicable dispute resolution and other initiatives like continuous evolution of PPP mode. Highway development in the country for bridging the required infrastructure gap is likely to be over in the coming years and development/construction activities can reduce progressively. A shift is expected from highway construction/ development to providing the quality service to various highway users by enhancing the use of technological applications, adoption of safety solutions, promotion of sustainability trends and augmenting existing source of finances. This shift has led to the emerging trends in roads and highways sector in India and is expected to resolve the issues in the coming future.

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