

Rocky Road to Progress

Improving road quality

Chander Agarwal, Executive Director, Transport Corporation of India

The Indian road network has increased by about 10 times from 0.4 million km in 1950-51 to about 4.24 million km in 2010-11. This is more than the road network in China and Brazil and second only to the US. Nonetheless, Indian roads are characterised by congestion and poor quality. This is partly because road freight volume has grown at a compound annual growth rate (CAGR) of 9.08 per cent, while road length has increased at a CAGR of about 4 per cent in the past 50 years.

National highways, which constitute just 1.67 per cent of the total road length in the country, handle 40 per cent of the total road traffic. The shortage of multi-lane highways coupled with poor road conditions and stoppage delays cause congestions, accidents and breakdowns and lead to high maintenance costs of vehicles. The average speed of a freight vehicle is only 20-24 km per hour, which translates into a daily distance of 250-400 km. This is significantly less than in developed countries (700-800 km a day).

Further, the condition of other roads – state highways and rural roads – is even worse. About 40 per cent of Indian villages have no access to all-weather roads. The problem is far more critical for the north-eastern states, which are poorly connected to the rest of the country. Urban roads are disproportionately congested due to lack of multi-lane stretches.

The government's initiative to develop world-class roads necessitated the involvement of the private sector. Public-private partnership has, therefore, become a focus area in road development initiatives. Viability gap funding and toll collection are the major instruments incentivising private investment in the road sector. However, these are also prone to corresponding risks like uncertain traffic vol-

umes, diversion of traffic, and revenue realisations. Traffic estimation is invariably faced with much criticism due to errors.

Toll of the tolls

India has a total of 8,502.4 km of toll roads, which generated a total revenue of Rs 43.64 billion in 2009-10. The central government plans to increase the length of toll roads to 30,000 km by 2017. Currently, there are about 525 toll plazas operating on national and state highways, each handling an average of about 20,000 vehicles a day.

Toll collection at the majority of the toll plazas is done manually. This results in inefficiencies, including traffic bottlenecks and revenue leakages. It has been estimated that a vehicle needs to wait for 5-10 minutes in the queue before leaving the toll plaza. Sample data available for the Delhi-Mumbai route estimates that the average waiting time at each toll plaza is about 10 minutes. On other key routes like Delhi-Bengaluru, toll delays as a

percentage of total delays have increased significantly in the past few years.

As per a study conducted by CRISIL, about 0.5-1 litre of fuel is consumed per hour by a vehicle at a toll plaza leading to wastage of about Rs 30-60 million per day or about Rs 10 billion in a year. The annual cost of such delays to the Indian economy is of the order of Rs 270 billion. Road transport is a major contributor to pollution and greenhouse gas (GHG) emission. Reduction in toll delays would not only translate into economic benefit in terms of a decrease in waiting time and saving of fuel but also help in saving precious time and limiting GHG emissions.

Electronic toll collection (ETC) has emerged as an alternative to manual toll collection. This system removes the limitations of manual toll systems and helps in reducing waiting time by automatically deducting the fare from the user account. With the use of ETC, vehicles can pass through toll booths without stopping, making it a more convenient and efficient method of toll collection.

ETC will also benefit toll operators as faster toll collection will lead to higher throughput, which would translate into increased revenue generation and reduced operating costs. The cost of managing manual toll collection booths is in the range of \$150,000-\$180,000 per year as compared to \$5,000 per year for ETC lanes.

ETC has already become operational in several developed countries like the US and Europe. The ETC system in China, which was introduced in 2007, covers 1,600 km of that country's highways. The global ETC market is expected to reach about \$6 billion by 2017, with the US being the largest market at an investment of \$210 billion. China is expected to be the fastest growing market with a CAGR of



20 per cent during 2012-17.

In India, the ETC facility is available only on a few highways and bridges. These are the Delhi-Gurgaon expressway, the Bangalore Electronic City elevated highway, the Noida toll bridge, the Badarpur elevated road, and the Ahmedabad-Mehsana expressway. Lack of computerised vehicle registration systems, cost implications for users, interoperability of ETC systems and the absence of a regulatory framework are major roadblocks to the smooth roll-out of ETC systems in the country.

A smooth ride

Expressways have emerged as the highest quality of roads ensuring fast transportation. Due to restricted access to pedestrians and animals and no intersections, the disruption to traffic is minimal. India has only 600 km-700 km of access-controlled expressways compared to 74,000 km in China. A recent study has recommended that the country should aim to have 18,637 km of expressways by the end of the Thirteenth Five Year Plan (2017-22). This would involve a massive financial outlay of about Rs 4,500 billion. Land acquisition and other clearances could be other crucial challenges.

There is a plan to constitute a National Expressway Authority of India (NEAI) to enhance the construction of expressways in the country, much on the lines of the National Highway Authority of India (NHAI). The primary responsibility of the NEAI would be to operate and maintain the expressways, adopt intelligent transportation systems (ITS) and enhance safety.

The central government has approved the construction of four expressways covering a total length of over 1,000 km under Phase VI of the National Highways Development Programme (NHDP). It envisages an investment of Rs 166.8 billion. These stretches are the Vadodara-Mumbai, Delhi-Meerut, Kolkata-Dhanbad and Bengaluru-Chennai expressways.

Logistic parks – The missing link

Logistics form another key component of transportation. Development of logistic parks would help in leveraging facilities not usually offered by ordinary warehouses. Facilities offered at

Paved roads in the US, China and India (%)		
Country	Paved roads	National highways/expressways
US	67.4	4.13
China	53.5	2.00
India	49.3	1.67

Note: Data related to the percentages of paved roads pertain to the year 2008.
Sources: Ministry of Road Transport and Highways; World Bank

Indian road network		
Category of highway/road	Length (km)	% of total road network
National highways/Expressways	70,934	1.67
State highways	154,522	3.65
Major district roads	2,577,396	60.84
Rural roads	1,433,577	33.64

Source: Ministry of Road Transport and Highways

logistic parks include customised warehousing, cold storage, inland container depots, multi-modal transport, truck terminals, railheads, aggregation/disaggregation of cargo and other similar facilities. Economies of scale and scope create a win-win formula for customers as well as operators. An estimate suggests that a company moving into a logistics park could reduce its logistics cost by as much as 50 per cent and co-located companies could enjoy cost savings of about 7-8 per cent.

Given the benefits associated with logistics parks, greater government involvement is necessary. It could promote the development of such parks by facilitating land acquisition, providing basic infrastructure, extending economic incentives, expediting approvals through single-window clearances and promoting development clusters for industry. Development of logistic parks is adversely affected by low levels of cargo containerisation in India. In developed countries about 80 per cent of cargo is containerised, compared to India's figure of 20 per cent.

While providing several economic benefits to the users, logistics parks also generate employment, promote multimodal transport and reduce pollution. Further, development of these parks could facilitate handling of more international cargo allowing India to compete with

Shanghai, Singapore, Hong Kong and Dubai.

Conclusion

The transportation mix in India is disproportionately biased towards roads. Indian roads carry about 60 per cent of the total freight volumes, while railways account for 35 per cent. In the US and China, it is different, with railways accounting for 47-48 per cent of the total freight volume. The ideal modal mix for India would involve handling equal freight volumes by railway and roads. This would, in turn, necessitate coordination among different ministries and authorities. An apex body with representation of all stakeholder ministries could be set up, which would expedite the process of development of such a system.

While India has made substantial progress since Independence, it has been lagging behind demand as far as construction of roads is concerned. This has led to congested highways and costly delays during transportation of freight. Lack of logistics parks has made storage of cargo an inefficient and costly proposition. Despite having the second largest road network in the world, logistics costs in India are higher than international benchmarks. These concerns must be addressed to sustain the economic growth envisaged in the Twelfth Five Year Plan. ▀