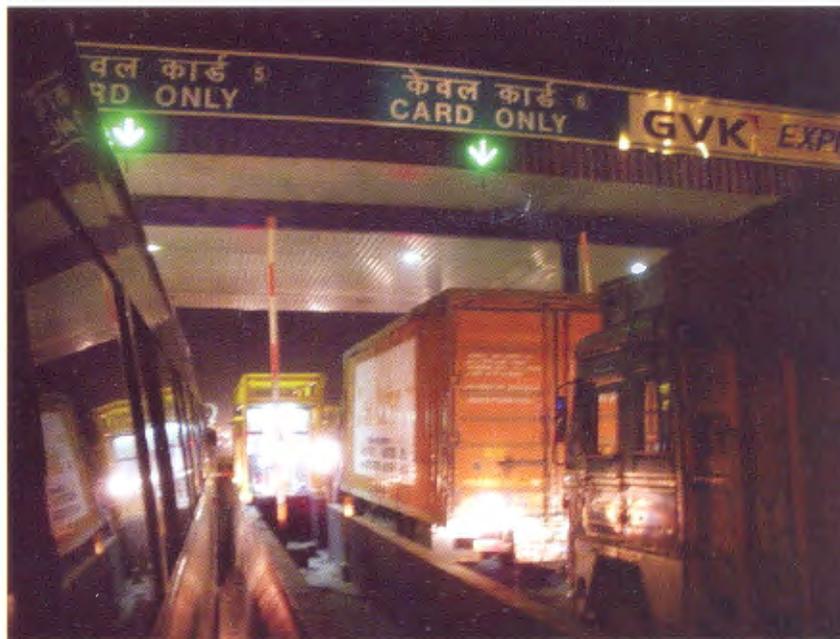


India has the second largest road network in the world with a road length of 4.24 million km. India's road density is among the highest in the world with 1.29 km of roads per sq. km of area. However, India's national highways and expressways constitute only 1.67% of the road length, and the percentage of paved roads is only 49.3%, lagging behind both the U.S. and China. While India's road freight volumes are increasing at a compounded annual growth rate (CAGR) of 9.08% and the population of vehicles (all types) is increasing at a CAGR of 10.76%, the road length is increasing at a CAGR of only 4.01%, indicating the paucity of roads. Moreover, roads are of poor quality, lacking maintenance and pedestrians and animals have uncontrolled access to roads, resulting in slow speed of vehicles, break-downs and accidents.

It has become imperative that new roads should be built, and the existing roads should be widened and properly maintained. However, these projects require massive investments, which are beyond the budgetary provisions and borrowings from banks and financial institutions. Therefore, private investments in the form of PPP must be sought for road development and maintenance projects. However, there are some concerns regarding project viability such as uncertain traffic volume, diversion of traffic, projected demand and revenue realization, toll structure and toll collection, and return on investments. The Government should adequately address these concerns, and to attract private investments, offer incentives such as Viability Gap Funding (VGF), land acquisition, waiver of taxes and duties etc. It is expected that in the 11th Five-Year Plan (2007-12), more than 50% of the investments in roads will be contributed by the private sector. Also, henceforth all National Highways Development Projects (NHDP) will be implemented in the PPP mode.

Toll collection is an alternative way of financing road development and maintenance projects. The majority of Indian toll plazas employ manual tolling systems. Manual toll collection is a slow



process, leading to congestions and long queues of vehicles at toll plazas. A CRISIL study estimates that a vehicle has to wait for about 5-10 minutes in the queue before it can pay the toll and leave the toll plaza. The data available for the Delhi-Mumbai route in the 2011-12 survey also confirmed that the average waiting time at a toll plaza is about 10 minutes. Moreover, the data for the Delhi-Bangalore and Delhi-Mumbai routes showed that toll delays and toll expenses as percentages of total stoppage delays and total stoppage expenses, respectively, had increased in 2011-12 over 2008-09, indicating the requirement of a thorough analysis of the toll collection process and toll structure.

To expedite the toll collection process, India should gradually move towards electronic toll collection (ETC). Implementation of ETC will not only reduce congestions and long queues at toll plazas, but also reduce operating costs for toll operators and plug revenue leakage. However, there are some concerns such as cost implications for users and toll operators, inter-operability of different ETC systems and so on, which need to be addressed before ETC can be implemented. The Committee, set up by the Government and chaired by Mr. Nandan Nilekani, recommended

the use of the passive Radio Frequency Identification (RFID) technology, which is not only fast becoming the popular global standard, but also less expensive and less complex to implement. The Committee recommended that the existing manual toll plazas be gradually converted to ETC plazas and the new toll plazas be built with ETC capabilities. The Government has accepted the recommendations of the Committee for implementation of ETC in India.

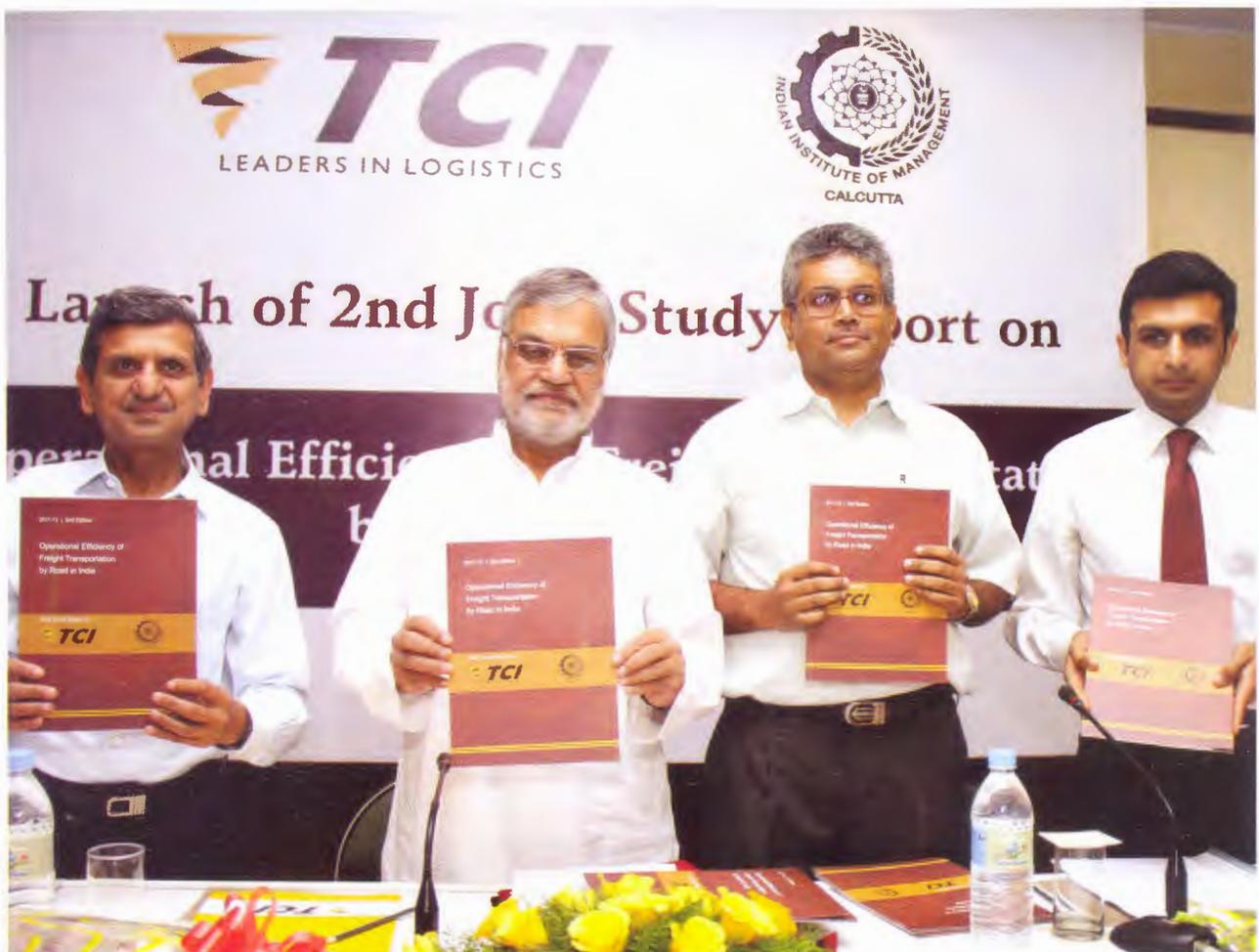
As mentioned before, India's roads and highways are easily accessible to slow-moving vehicles, pedestrians and animals, resulting in a low average speed of vehicles and a high number of accidents. India has a meager 600-700 km of access-controlled expressways compared to 74,000 km of expressways in China. India needs to build more high-quality, access-controlled expressways for faster connectivity between cities and towns.

The expressways should be equipped with Intelligent Transportation Systems (ITS) including round-the-clock CCTV surveillance for monitoring real-time traffic data and ensuring safety and security of users. A recent study recommends that 18,637 km of expressways need be built by the end of the 13th Five-Year Plan period, i.e. 2022.

However, the massive investment required

# Operational Efficiency of Freight Transportation by Road

Transport Corporation of India (TCI) in association with IIM- Calcutta recently released the second edition of joint study titled “Operational Efficiency of National Highways for Freight Transportation in India.” The report, which was unveiled by Union Road Transport & Highways Minister Dr. C P Joshi, highlights serious constraints in the road sector and suggests a series of measures to improve the scenario. Excerpts from the executive summary:



(left to right): D P Agarwal, VC & MD, TCI; Dr. C P Joshi, Union Cabinet Minister, Road Transport and Highways; Professor Subrata Mitra, IIM- Calcutta and Vineet Agarwal, JMD, TCI

# “Qualitative improvement is more important”

Vineet Agarwal, JMD, TCI comments on serious imports of the report:

**Do you find the basic findings of the report disappointing? The latest report is probably saying not much has changed when it comes to the improvement of road freight transportation segment?**

It is somewhat disappointing but you have to look at the positive points also. The average speed has gone up – from 21 to 23-24 km. It seems a very small improvement but if viewed in percentage terms, its close to 10 percent. An understanding of the issue is emerging and that is very important. When the first report had come out, it had triggered right kind of debate. Mr. Nandan Nilekani had also interviewed us for his book. In that book he had quoted TCI saying how electronic highways can help. Now ETC is getting implemented. And I think this is a major development in last three years.

**Seven- eight years ago it was generally believed that if you have toll plaza on highways, they would result in better regulations. Now it appears as if they themselves are contributing to the problem. How would you respond to it?**

The moot question is: how are they designed? What is the rationale behind them? Today when you go to certain toll plaza, there aren't places for trucks and cars. You will notice long queue. Secondly, even the fares are not right. At some places, you have got fares like Rs21-22. Now who is going to find Rs 1-2 change? Thirdly, even where you have electronic tolling for instance at Gurgaon, there is no penalty for customers who are not carrying electronic cards.

**An important statistic furnished by**

**your report is – road transportation business is growing by around nine percent, number of vehicles by 10 percent but road network by 4 percent. Anybody with some macro-economic understanding would call it a recipe for disaster. What's your take on it?**

I don't think using disaster would be the right term. You need to look at numbers in different perspective. What is the kind of roads that are being built? Are we targeting the high traffic density locations? These are important issues. Increasing the road length alone would be not enough. It is the qualitative improvement which is important. The qualitative improvement has to happen in high traffic density locations, in locations which have movement of over dimensional cargo (ODC). You need to expand those highways. And the quality of highways also need to be minutely judged. Can they last the high speed and continuous wear and tear? So qualitative improvement is more important than quantitative improvement.

**The minister made it absolutely clear that brownfield projects would be difficult to pursue and the correct route would be greenfield projects. But as we all know greenfield projects is very time consuming. If we view the scenario from this prism, do you foresee highway development exercise being expedited in the near to medium run?**

There has to be a combination of both the routes. I think, he rightly said vertical expansion has to happen vis-à-vis horizontal growth in the road sector. And this would obviously entail land acquisition which in my opinion

would not be as complicated as when you do it for industrial plants. We have seen that in DFC projects as well where the entire stretch of western corridor has already been acquired. So I would be hopeful for the future.

**The government is also of the feeling that a strong element of self-regulation is required to do away with the overloading trends which eventually affect the quality of roads. What do you have to say on this?**

Self-regulation anywhere is not an easy task. But yes, its an important factor and I think the associations need to work very seriously on it considering the long-term picture. You can't forget the benefits to the national economy if our roads are in good conditions. At some point of time, most transporters would have to bite the bullet.

**When you come out with the third edition of this report, may be two- three years later, what all difference you would like to see then? I am broadly talking about changes which are feasible given the kind of policy paralysis which is presently there.**

With ETC expanding more rapidly now, I think the average speed would increase and stoppage delays would come down. I would also expect some progress on express highways, some stretches would be awarded and some work would commence on them. And I would certainly expect that the government would draft a policy on logistics parks and multi-modal hubs. Some of it is already part of DFC and MDIFC but I would think a national policy would help in expediting the creation of these units.

# "Not much change in the scenario"

Prof. Subrata Mitra of IIM-Calcutta explains the degree of inefficiency in road transportation and its huge cost implications for the economy:

**Am I correct in my assessment that the biggest takeaway of your report is: practically nothing has changed in last three years?**

Yes. Things have more or less remained unchanged. The only difference we saw which has been highlighted in the report - the contribution of toll expenses to total stoppage expenses has increased. So that means there are more toll roads and toll delays as a percentage of total stoppage delays have increased.

**At one point in time, there was this strong perception that with more toll plaza, you will have better regulation on our highways. But that perception seems to be losing ground?**

There are two issues. You need more funds and that's why you collect tolls. Now how do you collect tolls? If you collect tolls manually which is happening in India, it results in delays. But they are gradually moving towards electronic toll collection. Once you have electronic toll collection in place, the delays would be minimised.

**On a cumulative basis you are saying we are losing around \$17 billion every year because of inefficiencies in road transportation?**

We are losing \$5.5 billion because of delays in road transportation. Other one is addition of fuel consumption. Just to illustrate, if you are driving a car in top gear at a modest speed without any stoppage for a long duration, you will get maximum mileage. When you

**Things are happening though definitely not at the pace which is actually required in road freight transportation.**

see a car manufacturer talking about mileage, the company is projecting an ideal condition. If you can attain that mileage, you can certainly reduce fuel consumption which is not happening on Indian roads due to delays. I made an estimate and if you do that you can save \$12 billion on fuel consumption annually.

**Freight volumes are increasing but there is no corresponding improvement in road network. Do you foresee any change in the scenario?**

Its true that freight volumes are increasing but improvement or expansion in road network is lagging behind. There are two things. The number of vehicles and freight volumes are growing more than the growth in road lengths. That means you have to build more roads or if you have existing roads, you have to widen them. So two lanes have to be converted in four lanes and four into six. This is how

capacity can be improved. Yes, there are constraints for existing roads. But you can always think of greenfield projects.

**But greenfield projects take more time to materialise than brownfields?**

Yes, they certainly take more time. But once you do them, they will last for a long time. You have to do both - a right mix of greenfield and brownfield.

**Over a period of next two years and that is the time left with the present government, what all they can do to bring even a slight change in the road transportation sector?**

The minister has said that they are trying to expedite the implementation of ETC and this would fetch good results. I think, revenue leakage can be stopped on the stretches where it is implemented. The report talks about more investment in logistics parks and hubs like Nagpur. And creation of more access controlled expressways need to be given a push. We have given the comparative analysis of express ways in China and India. We certainly need to devise ways and means to expand them.

**At the end of the day, are you disappointed? There aren't many positive takeaways from the report.**

I wouldn't say I am disappointed. Things are happening though definitely not at the pace which is actually required in road freight transportation.

for the expressway projects is estimated at Rs. 450,000 crore. The Government, under NHDP-VI, has already given the approval for constructing 4 expressways of more than 1,000 km length at a financial outlay of Rs. 16,680 crore. Therefore, it is suggested that private participation in expressway projects in the form of PPP should be encouraged. There are, of course, concerns regarding projected traffic volumes, revenue realization and profitability of such projects. Besides adequately addressing these concerns, the Government should also facilitate land acquisition, provide the basic infrastructure, give quick approvals, and offer economic incentives such as waiver of taxes and duties. Revenues may be realized through toll collection and property development in the vicinity of the expressways. The report also highlights the importance of logistics parks/hubs. Logistics parks differ from ordinary warehouses in terms of offering value-added services shared by multiple users. Benefits accrued to users include cost savings to the extent of 50% through economies of scale and scope, efficient use of multi-modal transportation, and availability of value-added services under one roof. According to an estimate, strategic locations of logistics parks may save India USD 13-16 billion in logistics costs. The scale of Indian logistics parks is very small (only 3-4% of the warehouses may qualify as multi-modal logistics parks) compared to the same in China and other developed Asian countries. India needs to scale up its logistics parks and clearly differentiate them from ordinary warehouses if it wants to compete with the logistics parks in Hong Kong, Shanghai, Singapore and Dubai to capture a reasonable share of international cargo. There are some existing and promising hubs, which have already been identified based on their



locations, proximity to economic and industrial activities, and connectivity by rail, road etc.

The Ministry of Railways has also proposed to set up a number of multi-modal logistics parks along the dedicated freight corridor. However, there are some concerns such as the low level of containerization of cargo in India and the required investment for setting up logistics parks. For logistics parks to be successful, the scale of containerization of cargo has to increase. While in developed countries, 80% of the cargo is containerized, in India, the figure is only 20%. Out of the 560 million containers handled across the world in 2010, India handled only 9.4 million containers while China, Singapore and Hong Kong handled 150 million, 28 million and 24 million containers, respectively. While India has 130 Container Freight Stations (CFS) and 61 Inland Container Depots (ICD), there are 3,000 CFS and ICD in China.

Therefore, the Government has to play an active role in setting up more CFS and ICD to promote the containerization of cargo. To build and operate logistics parks, investments from the private sector would have to be sought in the PPP mode with appropriate economic incentives.

Finally, the potential of Nagpur as an emerging air cargo and logistics hub has been discussed. Nagpur already boasts of a number of logistics parks because of its location and connectivity through rail, road and air. The proposed logistics hub spread over 4,354 hectares, which is expected to be completed by 2035 at an estimated cost of Rs. 2,581 crore, will also include an integrated township and a Special Economic Zone (SEZ). Once completed, the project is expected to serve 14 million passengers, handle 0.87 million tonnes of cargo and generate revenues worth Rs. 5,280 crore annually. If developed properly, Nagpur has the potential to emerge as the logistics hub not only for India but also for the South-East Asian region.

As far as the route surveys are concerned, no appreciable differences in parameters related to the operational efficiency of freight transportation by road have been observed in 2011-12 compared to 2008-09. Although it seems that the mileage of vehicles has marginally improved, the average speed of vehicles, stoppage delay per km and stoppage expenses per tonne-km have more or less remained at the same level. Average trip expenses and freight rates per tonne-km have, of course, increased due to inflation.