

Toll Supported Finance for Highway Development in India

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Abstract: *The National Highway Development Programme (NHDP) - the massive road development programme was launched by the Govt. in the year 1999 with an objective to provide high speed roads there by transforming the movement of goods and people in the Country. While the project broadens its scope, funds have become a major concern. An investment of about Rs. 2 trillion is required for all projects under the programme. The first two phases of the NHDP saw more funds being pumped in from fuel surcharges and assistance from multilateral agencies. Comparatively speaking, private sector participation was low-only to the extent of Rs. 125 billion. The trend however was shifted in favour of financing through the private sector participation. From phase III onwards, all the projects of the NHDP were taken up on BOT basis, through either toll or annuity. In fact toll roads were out of favour for many years due to concerns about traffic diversions away from the paid facilities. However, there has been a revival of interest in the last 10 years, primarily because tolling makes it easier to raise off balance- sheet financing and to encourage greater involvement of the private sectors. The paper discusses the various aspects of the highway financing system and how the toll (user fee) has become an established source of funds in India, and an update on some noteworthy highway projects which are implemented successfully on a BOT basis.*

Keywords: *Toll road, BOT, NHDP, PPP, Finance.*

INTRODUCTION

Basic principle in highway finance is that the funds spent on highway are recovered from the road users. The recovery may be both direct and indirect. Two general methods of highway financing are: Pay-as-you-go method and Credit financing method. In pay-as-you-go method, the payment for highway improvements, maintenance and operation is made from the central revenue where as in credit financing method, the payment for highway improvement is made from borrowed money and this amount and the interests are re-paid from the future income. Toll roads can be classified as congestion relievers, inter-city arterials, development roads, or bridges and tunnels. Congestion relievers are relatively short roads that are constructed to relieve heavy traffic congestion on existing urban routes. Congestion relievers, while expensive to build due to land costs, generally have significant revenue potential because they tend to serve heavy traffic demand. However, the high land acquisition and construction costs may require high tolls if privately financed. Inter-city arterial roads are built to improve access between major cities, to airports or to port/terminal complexes. These roads tend to be expensive since they are generally long, high-capacity, and built to serve heavy truck traffic. Development roads link relatively remote areas targeted for economic development with urban centers or major transportation routes. While development roads can provide a stimulus to economic growth, traffic volumes generally are not financially sufficient in the early years, and thus are seen as speculative investments that require substantial public participation. Bridges and tunnels are typically very short, very expensive to build per kilometre relative to roads, and (in most cases) serve high volumes of traffic. They are often built as congestion relievers and may have a similar strong financial capability due to traffic volumes.

Tolls have been placed on roads at various times in history, often to generate funds for repayment of toll revenue bonds used to finance constructions and/or operation. In recent years there has been a growing realization in the govt. that road development cannot be brought about only through budgetary support or even through private investment support. The consensus is that a combination of different sources of funding would be the best way forward for the road development. Historically, development of NHs has been at best sketchy. The reforms in the road sector started during 90s to address major costs and financing problems of the sector with the primary objective of reconstruction and maintenance of existing roads and assess public finance required by the sector. The reform was to contribute to limit the government's role in the infrastructure sector while attracting as much private finance as possible to fund the immediate requirement for improvements and expansion of the road network in the country. Involving private sector in exchange for the right to charge user tolls was seen as a way to shifting the financial burden to users and maintaining roads more efficiently. However question arise as to what kind of roads interims of traffic density are suitable for tolling , levy of user charges and commercially viable

model of finance and to what extent the toll roads are successful and toll fee support the finance required for the road development in India.

LITERATURE REVIEW

After World War II, high performance expressways were built in most developed countries in Europe, U.S.A, Canada and Japan. For funding these expressways, some countries adopted tax financing while others relied on toll financing. Even both these systems have been used in some countries as in the U.S. In France, Spain, and Italy only intercity expressways were tolled. However, in recent times, it has been observed that many developed countries which once depended on tax financing have also turned to toll system due to erosion of the purchasing power of government taxes because of inflation. Many developing countries such as Mexico, Malaysia, Indonesia and Thailand, however, have recently started to build high performance expressways relying mostly on toll financing and private concessions (Kapila et. al. 1996).

Highway infrastructure traditionally has been funded through general government budgets and dedicated taxes and fees rather than tolls. In most industrial countries 90 percent or more of highway kilometers are publicly funded; in developing countries governments often bear the entire cost. However, the limited resources available through traditional government funding sources has led to increasing interest in private toll roads as an alternative way of meeting highway needs. Several additional factors have contributed to the renewed interest in private tolling, including a worldwide trend toward commercialization and privatization of state-owned enterprises; the success of public toll roads in raising capital; and advances in tolling technology, making tolling more efficient and convenient (Fisher, Babbar).

Qamar (2010) pointed that in order to bring private investment into the road sector, the Ministry of Road Transport and Highways (MoRTH) aims to award over 85 percent of National highways and expressways projects on a Built Operate Transfer (BOT) toll basis. While this will result in a large number of toll booths on the Indian road network, the road user would prefer to travel seamlessly across toll roads. An appropriate combination of technology and operational procedures is required to meet all the functional requirements of tolling and deliver a satisfactory user experience. The National Highway fee rules, 2008 prescribed the stretches on which user fee is collected, the capping rates per km for different types of vehicles, the mechanism to compute toll rates for BOT projects, concession to be given to local and frequent users, revision of rates, etc (Chandrasekhar, 2010). Ramnani (2009) in their study summarized that Tamil Nadu Road Development Corporation is JV Company between TNIDC and ILFS with the objective to capitalise private sector participation and investment in the road sector and to initiate commercialisation of Operations and Maintenance of Road assets. Shubhara (2014) observes the toll collection across the country is improving on the account of the higher traffic volumes generated on some major roadway corridors in the country particularly with high percentage of commercial vehicles

The Concept of BOT Model

The concept of BOT was first introduced in Turkey, as part of privatization programme. It immediately captured the interest of other developing countries including India. In the BOT project, the government provides a 'concession' that permits a promoter to build a facility and operate it for a specific period of time. Project promoters use the revenues generated during the concession period to pay back the loan and to get a return on their investment. After the concession period is over, the facility is transferred to the government. The project promoters are normally expected to undertake the designated responsibilities for constructing the project, arranging financing, performing maintenance, and collecting tolls, while the public sector retains legal ownership. In most projects design responsibility is shared, with the public sector taking the lead in the preliminary design (including route alignment, number of lanes, interchanges, and other high-level design specifications) and the private sector completing the detailed design, subject to government approval. There has been growing competition among private players to undertake road projects, for NHDP in particular, the private sector has responded enthusiastically. Projects costing over 60 billions are being implemented through BOT and annuity formats. Rajasthan was the first state to pass legislation to enable private sector participation in 1994. The state was also an early bird in amending the Motor Vehicles Taxation Act (1951) and drafting the model concession agreement for BOT projects. This model would offer separate tenders for construction and tolling so that each risk is separately born by the most competent party. This is very different from usual BOT model where the entire risk is borne by the same private player.

Salient Features of NHAI and Tolling System in India

Earlier the toll tax was levied for bridges during 1960s and it was levied for permanent bridges during

1978-1992. Due to paucity of funds there has been no concerted Govt. program and the development of road network has been lagging. As a result the total length of the NH road network at the time of independence was only about 21,500 km. and the network has been extended to only around 52,000 km. by the year 2000. The NHAI was set up in India in 1988 to look after the planning, construction, maintenance and operation NH roads. The Indian Tolls Act, 1851 and the NH Act, 1956 were suitably amended to facilitate private investment in road sector. The amended acts permit levy of user fee on section of NHs and also enable the Govt. to involve private sector directly in development and maintenance of NHs for a specified period. Subsequently toll was imposed on the developed sections of NHs in 1997.

The new toll regime / rules were introduced in 2008. Majority of toll road projects employ manual and semi- automatic tolling systems for toll fee collections. As the system is slow process and leading to long queues and congestion at plazas. Some studies found that average waiting time on high volume routes is about 10 minutes for a vehicle before a toll transaction made. The NHAI initiated the project of electronic tolling system in the year 2010 and it will take some more time to equip all toll plazas with electronic tolling system. Previously the toll was collected by the NHAI departmentally and the toll plazas were awarded through open competitive bidding. During the year 2011-12, Operate Maintain and Toll (OMT) a new model of contract for tolling and maintenance operations has been introduced. At present there are about 14,000 km of completed highways under tolling in India, out of which, about 7200 km are under direct private tolling i.e BOT toll projects while around 7000 km are under departmental tolling. In FY 2013-14 the toll revenue worth Rs. 92 billion was collected by the NHAI.

Benefits of Toll Road System

- i. **New Source of Finance:** The toll revenue is a "new" source of revenue, where previously roads were supported out of general Government revenues. This has been a major objective in many countries, given pressure to reduce taxes. For example, in Norway toll revenue represents 32 percent of the budget for the national road system and it is around 46 percent in Spain.
- ii. **Stable Source of Finance:** Tolls provide an ongoing revenue source, which is not tied to the annual Government budgetary process. This can be particularly important for raising debt finance outside the national accounts and requires a Government corporation or private sector operator.
- iii. **Dedicated Source of Finance:** The funds from toll revenues can be dedicated to the support of construction and maintenance for a particular road thereby ensuring that maintenance funds in particular do not compete with the requirements of other roads in the network.
- iv. **User Pays and Internalizing of Externalities:** Some Governments have introduced tolls in pursuit of a general policy to increase the extent of "use related payment" or with the goal of reducing road use and internalizing the negative effects of road usage (for example, congestion related prices). This is central to a 'sustainable' transport policy. In Netherlands tolls are levied with the intention of directing road users to other means of transport, both to ease road traffic conditions and to encourage use of the railways and inland waterways.
- v. **Private Sector Development:** Some Governments have sought private sector participation in roads where they wanted to develop the road network, and to develop the private sector within their economy at the same time. In addition the involvement of the private sector can allow the government to finance at least part of the road development off balance sheet. Some governments also use the private sector concessions as a mechanism for promoting/explaining the introduction and increase of tolls to reluctant public using phrases such as "it is not what the Government would want but our hands are tied by the contract."

Potential Consequences of Road Tolling

- i. **Cost and Revenue Mismatch:** Traffic and toll levels may not be sufficient to cover all costs, including construction, operation and maintenance. In developing countries where traffic levels are low or where construction costs are high (particularly likely in urban areas because of land acquisition and clearance costs), it is unlikely that the tolls will ever cover more than operation and maintenance and perhaps a part of the construction cost.
- ii. **Diversion of Traffic:** Price elasticity of demand and the provision of free alternatives to the tolled road, will affect the level of traffic on the facility. In turn this may mean that some potential economic benefits of the new road are lost since the objective of new road provision is to move people and goods more reliably and quickly. However there are additional consequences which result from the tolls. For example,
 - Toll can discourage unnecessary trips and therefore provide environmental benefits,
 - Toll may be too high for the poor to benefit from the new facilities, or

- Tolls may be so high that traffic diverts off the new road onto parallel roads which benefits that the new road could have provided.
- i. Political Opposition to Toll: Political opposition to road tolling has been significant in many countries. The opposition has meant that toll rates have not been increased as planned or un-tolled facilities have been developed to provide an alternative. Both actions have negatively affected the financial outcome of the toll project and have affected the economic return from the road.

The Govt's Initiatives for Financing National Highways

Traditionally financing for development of National Highways in India was from the normal budgetary resources of Government of India. But the funds were quite inadequate, to meet the demands; which was mainly due to more demands from other priority sectors such as health and education.

In early 1980s, in order to augment the available resources, loans were taken from multi-lateral agencies viz. World Bank (WB), Asian Development Bank (ADB) and Japan Bank for International Cooperation (JBIC). In early 1990s, Government of India took two major policy decisions. One was for liberalization of economy and other was to encourage Public Private Partnership (PPP) in infrastructure development. Consequently, requisite legislative and legal provisions were put in position and incentives also announced.

National Highways Act 1956 is the legislative and legal document governing various aspects of National Highways which is responsibility of Central Government. The original Act provided for levy of user fee for temporary bridges, tunnels and ferries on highways. Since the basic promise for PPP in road sector is the return of investment through levy of user fee, NH Act 1956 was amended in 1992, to make provision for levy of user fee on National highway sections as well. Subsequently, in 1995, this act was further amended to make provision that the Central Government may enter into an agreement with any 'person' in relation to the development and maintenance of the whole or any part of a National Highway. Then, in 1997, the Government notified Fee Rules. Also the procedure for acquisition of land required for development of National Highways was simplified to make it expeditious.

Investments on NHDP Programme - Toll Roads

The National Highways have a total length of 70548 km to serve as the arterial network of the country. The development of National Highways is the responsibility of the Government of India. The Government of India has launched major initiatives to upgrade and strengthen National Highways through various phases of National Highways Development project (NHDP), which are briefly as under:

- NHDP Phase I: Government has approved four/ six/eight laning of 7,498 km of National Highways at an estimated cost of Rs. 30,300 crore. It mainly includes four/ six/eight laning of Golden Quadrilateral connecting four metropolitan cities i.e. Delhi, Mumbai, Chennai and Kolkata. Implementation of NHDP-I mainly on Item Rate Construction Contract (IRCC). All the contracts awarded and about 94% of NHDP-I project has been completed. Around 12% through PPP route on BOT (Toll) [6.0%] and BOT (Annuity) [6.0%] mode.
- NHDP Phase II: Under this Government has approved 6644 km of National Highways to be widened to four /six lane facility at a cost of Rs. 34,339 crore. Under this North South Corridor from Srinagar to Kanyakumari with Cochin Selam Spur and East West Corridor from Silchar to Porbandar are to be developed. Implementation of NHDP-II mainly on IRCC. Though around 24% through PPP on BOT (Toll) [11%] and BOT (Annuity) [13%]. 87.34% of length is awarded out of which around 19.51% completed. NHDP-II is scheduled for completion by Dec. 2009.
- NHDP Phase III : Under this, Government has approved upgradation of 12109 km of existing National Highways to two lane with paved shoulders/ four /six lane having high traffic density, connecting important tourist locations, economically important areas , State capitals etc on BOT basis with a maximum viability gap funding (VGF) of 40%. The estimated cost for development of these stretches is Rs. 80,626 crore. 17.13% of length awarded, out of which 3.39% length completed. NHDP-III is scheduled for completion by Dec. 2013.
- NHDP Phase IV : There is a proposal under consideration for widening of 20,000 km of existing single /intermediate /two lane highways to two lane with paved shoulders at an estimated cost of Rs. 27,800 crore through PPP route on BOT (Toll) /BOT (Annuity) basis.
- NHDP Phase V: Under this Government has approved six laning of 6500 km of National Highways at a cost of Rs. 41,210 crore through PPP route on BOT (Toll) mode using Design Build Finance and Operate (DBFO) pattern with a maximum VGF of 10%. In DBFO private parties needs the upfront cost of design, construction and expenditure on annual maintenance and recovers the entire cost along with the interest from toll

collection during the concession period. A length of 882 km awarded. NHDP V is scheduled for completion by Dec. 2012.

- NHDP Phase VI: Under this Government has approved construction of 1000 km of expressways at an estimated cost of Rs. 16,680 crore through PPP route on BOT (Toll) mode following a DBFO pattern with a maximum VGF of 40%. Action is being taken for preparation of feasibility report. NHDP-VI is scheduled for completion by Dec. 2015.
- NHDP Phase VII: Under this Government has approved construction of 700 km of standalone ring roads/bypasses as well as grade separators, flyovers, elevated road, tunnels road over bridge, under passes etc at an estimated cost of Rs. 16,680 crore through PPP route on BOT (Toll) mode with a maximum VGF of 40% Action is being taken for preparation of feasibility study. NHDP-VII is scheduled for completion by Dec. 2014.

Table 1 : Financing Pattern of NHDP

Likely Sources	Rs Cr. (on 1999 prices)	Us\$ billions (on 1999 price)
Cess on Petrol and Diesel	20,000	4.90
External assistance	20,000	4.90
Market borrowings	10,000	2.40
Private Sector Participation	4,000	1.00
Total cost	Rs. 54000 cr.	US\$ 13.2 billion

Source: Ministry of Finance, Govt. of India

Table 2 : Various Phases of ongoing NHDP

NHDP Phase	Particulars	Length (in km)	Investment Rs. in Crore (US\$ billion)
Phases I & II	Balance work of GQ and EW-NS corridors	9,000	42,000 (9.33)
Phase III	4-laning	10,000	55,000 (12.22)
Phase IV	2-Laning	20,000	25,000 (5.55)
Phase V	6-laning of selected stretches	5,000	17,500 (3.88)
Phase VI	Development of expressways	1,000	15,000 (3.33)
Phase VII	Ring roads, Bypasses, Grade Separators, Service roads etc.	-	15,000 (3.33)
	Accelerated Road Development Project for North-East region	-	2,500 (0.55)
Total		45,000	1,72,000 (38.22)

Source: Planning Commission of India

Table 3 : Different Modes of Project Delivery in NHDP

NHDP Phase	Item	CC	BOT (Toll)	BOT (Annuity)	Total
NHDP – I (Balance Work)	Length (in km)	1,711	20	7	1,738
	Cost (Rs. in cr.)	8,145	581	85	8,811
NHDP – II (Balance Work)	Length (in km)	4,569	1,237	930**	6,736
	Cost (Rs. in cr.)	29,493	8,065	6,064	43,623
NHDP – III	Length (in km)	-	10,000	-	10,000
	Cost (Rs. in cr.)	-	65,197	-	65,197
NHDP – IV	Length (in km)	-	5,000	15,000**	20,000
	Cost (Rs. in cr.)	-	6,950	20,850	27,800
NHDP – V	Length (in km)	-	6,500	-	6,500
	Cost (Rs. in cr.)	-	41,210	-	41,210
NHDP – VI	Length (in km)	-	1,000	-	1,000
	Cost (Rs. in cr.)	-	16,680	-	16,680
NHDP – VII	Length (in km)	-	-	-	-
	Cost (Rs. in cr.)	2,594	9,638	4,448*	16,680
TOTAL	Length (in km)	6,280	23,757	15,937	45,974*
	Cost (Rs. in Cr.)	40,232 [8.94 b]	1,48,321	31,447	2,20,000
	[US\$]		[32.96 b]	[6.98 b]	[48.88 b]

Source: Planning Commission of India

Toll Revenue Trends

The Practice of tolling roads has slowly but steadily gained acceptance. This has reflected in the marked increase in toll collection at both the national and state levels and it has prompted the decision to implement more projects. Toll revenues from national highways have increased consistently. Toll collections for 2006-07 are estimated at Rs 10.3 billion, an increase of about 30 per cent over 2005-06. Of this, 80 per cent, of the collection

are from public-funded projects and the remaining 20 per cent from private projects. Prior to this, collections witnessed growth rates of 76 per cent in 2005-06 and 25 per cent in 2004-05. The decline in 2006 & 07 has been attributed to the delay in bringing eight new stretches under the toll net. The agency continued to collect Rs.1,415 cr. and Rs.1,702 cr. in the financial years 2007-08 and 2008-08 respectively. In the past two financial years i.e 2013-14 and 2014-15 the half yearly data shows the toll revenue collection has been far higher than the projected revenues. Experts suggest that the tolling potential of national highways can be further enhanced. Estimated toll collections for the Golden Quadrilateral (GQ) and the North-South-East-West (NSEW) projects are Rs 5 million per km and Rs 1.8 million per km respectively. This constitutes 3-5 per cent per annum of the cost of four-laning thesenetworks. Table 4 Presents toll collection financial year wise.

Table 4 : Estimated Toll Collection by NHAI

Year	Collections (Rs. Cr.)
2001-02	68
2002-03	303
2003-04	361
2004-05	452
2005-06	798
2006-07	1030
2007-08	1402
2008-09	1415
2009-10	4400
2010-11	5900
2011-12	8000
2013-14 (half year)	5450
2014-15 (half year)	6338

Source: Compiled by author from various sources

CONCLUSION

During the 11th Five Year Plan, about 50% of the 10600 km of NH completed under NHDP were funded through BOT-toll model. In contrast during 10th Plan, only about 10% of the 5445 km of NH built under BOT-Toll model. The Govt, of India has been encouraging private sector participation for road projects on BOT basis and makes suggestions which could make highway venture more attractive for private entrepreneurs. However, the success of toll roads is highly dependent on public support. Public awareness need to be properly generated to make road users pay 100 percent of the cost of building and maintaining the toll road. It is to be clarified adequately to the public that the existing road is currently reaching its capacity and operating at poor level of service during peak hours of the day resulting in economic loss due to delays and high operating costs for the road user as well as high accident rates. Hence the tolls roads are necessary and are specifically meant for those who want to travel fast and safely and enjoy greater comfort and ease when traveling long distances. Those who are content to travel more slowly and dangerously can still use the existing routes which the government authorities will continue to provide and maintain. They will not have to pay tolls for using such old routes.

References

- [1]. Agarwal, V. (2014). RFID Tolling Impacts and Challenges. *Traffic Infra Tech*, Vol. 4, No. 5, pp. 31-31.
- [2]. Agrawal, R. & Verma, S. (2008). Operation and Maintenance of Road on BOT Contract, A Thesis Report, NICMAR, Pune. pp. 23-30.
- [3]. Chandrasehkar, M. (2010). Policy reforms towards increasing private sector participation. *Indian Infrastructure*. Vol. 13, No. 2, pp. 42-44.
- [4]. Estache, A. et al. The Long and Winding Path to Private Financing and Regulation of Toll Roads
- [5]. Fisher, G. & Babbar, S. Private Financing of Toll Roads RMC Discussion Paper Series, 117.
- [6]. Funding for National Highway Program, (July. 2000). *Indin Infra*, Vol. 2. No.17, pp. 42-43.
- [7]. Gupta, M. C, Kansal, R. & Tiwari, A. (1996). Innovative Contracting Procedure for Procuring Infrastructure Facilities, Proceedings of International Symposium on Infrastructure of the Future-Theme: Transportation ,ACCEI. Nov. 25-29, Bangalore. pp.105 –107.
- [8]. James H. Banks. (1998). Introduction to Transportation Engg., Mc Graw-hill International Editions, Civil Engg. Series.
- [9]. Kapila, K. K. & Khatri, S. K. (1996). Privatisation of Highways-An Overview. International Symposium on Infrastructure of The Future Proceedings, Bangalore, India, pp-129-134.

- [10]. Ministry of Finance, GOI. Public Private Partnership: Creating an Enabling Environment for State Project.
- [11]. NHAI Collects Rs. 6330 Crore In Toll Revenue in April-14, Live Mint, Dated 30 /12 /14.
- [12]. Report of core group, Financing of NHDP. Published by Planning Commission of India.
- [13]. Road Map for Growth. Indian Infra. Vol. 2, No. 2 , pp. 48-49, 2009.
- [14]. Sharif, Qamar. (2010), Electronic Toll Collection beginning towards Seamless Travel, Indian Infrastructure, Vol. 13, No. 5, pp. 22-24.
- [15]. Shubhra, T. (2014). After Long, Toll Revenue Gets A Boost From Higher Traffic. Financial Express. Vol. 249. [Accessed on 24 Nov. 2014].
- [16]. Singh, R. P. (2014). The Challenging Face Of The Indian Tolling Industry. Traffic Infra Tech. Vol. 4., No. 5, pp. 24–25.
- [17]. Thomas, A. V. (2005). Adequacy of Developmental efforts in Indian Road Projects. Indian Highways. Vol. 33, No.7. pp. 44-46.
- [18]. World Bank Report. Financing Infrastructure : Addressing Constraints and Challenges.
- [19]. Yashu, R. (2009). IT Corridor First Phase Operationalised after Several Delays. Indian Infrastructure, Vol. 11, No. 6 pp. 59-60.