



DEVELOPMENT PROGRAMS THAT SKEWED THE HIGHWAYS IN INDIA AND THEIR FINANCIAL STRUCTURE

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Abstract

The article focuses on the government policies and initiatives that have played a vital role in shaping India's network infrastructure over the years. It mainly concentrates on the funding mechanisms, considering their feature and the impact on the development of roads and networks in India.

Introduction to Nation Highways

India has the second-longest road network in the world, spanning over 54.82 lakh km. Although they represent only 2% of the entire road network, national highways handle 40% of all traffic.

Prior to 1997, when the National Highway Authority of India (NHAI) established a process for placing full authority over National Highways and their development in India under the Ministry of Road Transport and Highways (MORTH), highway development in India was initially handled by a variety of institutions operating at different levels of government.

Through the National Highway Development Project (NHDP), Phase 1 and Phase 2 of the NHAI were launched to strengthen the nation's economy. The NHDP was then extended to multiple phases.

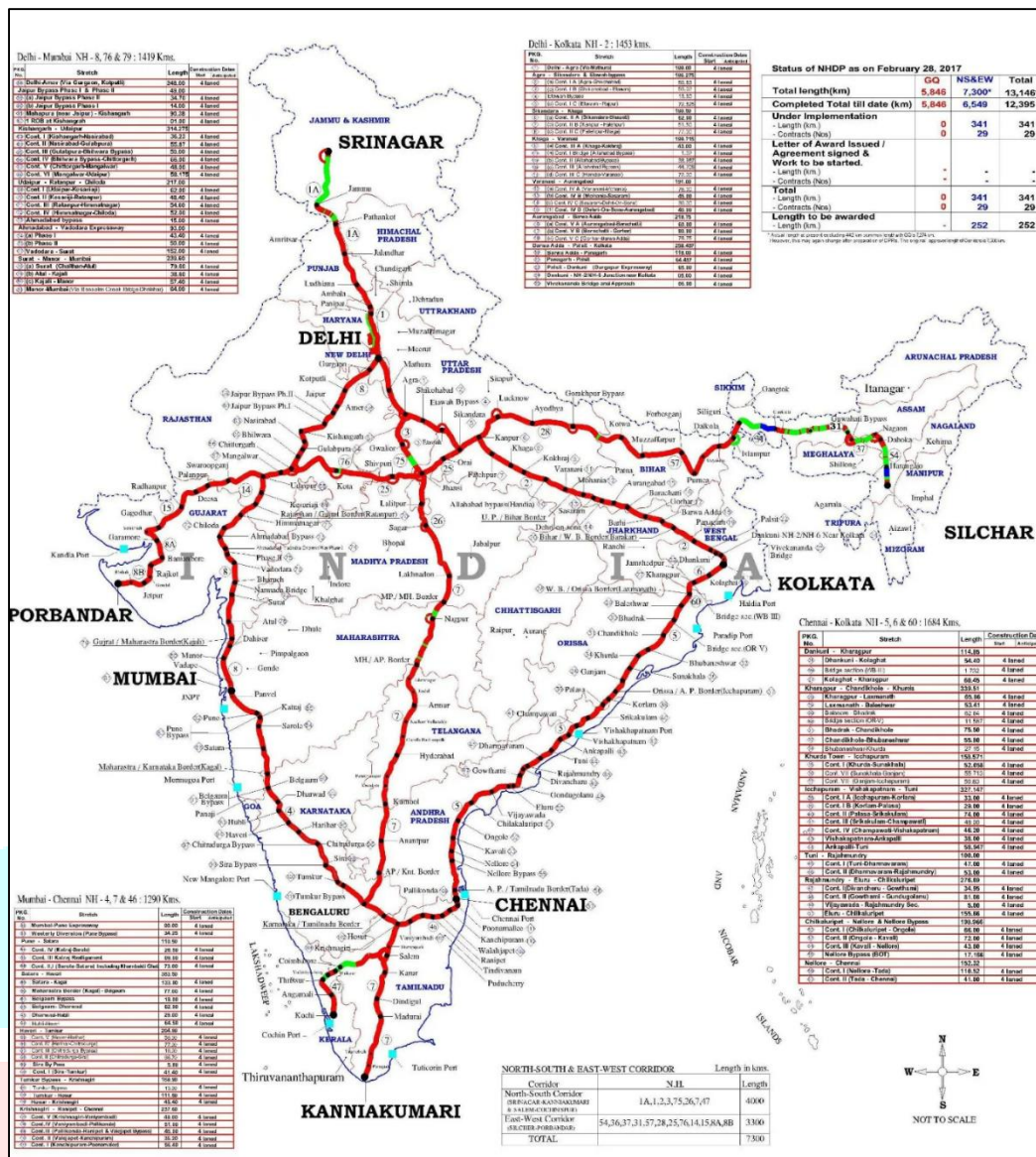
Programs held by the Government/s over the years

1. NHDP

National Highway Development Project (NHDP) over different phases:

- i. NHDP Phase 1: Four lanes of 6,359 Km at the cost of Rs 30,300Cr was approved on 12th January 2000.
- ii. NHDP Phase 2: Four lanes of 6,702 Km at the cost of Rs 34,389Cr was approved in December 2003.

These two phases comprise the Golden Quadrilateral and North-South and East-West corridors. Port connectivity was also part of this project.



Map of Phase 1 and Phase 2(GO and N-S and E-W Corridors)

Golden Quadrilateral connects four major cities i.e., Delhi, Mumbai, Chennai, and Kolkata.

The north-south and east-west corridors connect Srinagar in the north to Kanyakumari in the south, including the network from Salem to Kochi and Silchar in the east to Porbandar in the west.

- iii. Phase 3: On April 10th, the government approved 12,000kms at the estimated cost of 80,626 crores.
- iv. Phase 4: On June 18th, 2008, the government of India (GOI) approved the upgradation and strengthening of 20,000 km. National Highways were upgraded from 2 to 4-lane paved shoulders under PPC/BOT.
- v. Phase 5: The government approved a 6-lane road of 6,500kms comprising 5,700kms of golden quadrilateral and a balance of 800kms of other sections under NHDP phase 5. The government approved this phase on October 5th, 2006, at the cost of 41,210 crores.
- vi. Phase 6: Under NHDP phase 6, the government approved the construction of 1000 km of expressways with complete access control of new alignment in November 2006 with an estimated cost of 16,680 crores. The Bengaluru-Chennai on NH-4, which is 334 km long, is one of the examples of phase 6 projects.
- vii. Phase 7: The government approved the construction of ring roads, bypasses, grade separators, elevated roads, and tunnels at an estimated cost of 16,680 crores under the NHDP phase 7 projects.

Salient features of Phase 3 to Phase 7 NHDP projects:

- i. Converting 2 and 4-lane highways into 4 and 6-lane highways.
- ii. Development and Maintenance.
- iii. Organizations such as the PWD department and border road organization carried out development work.
- iv. Strengthening of roads, construction of bypasses, and maintenance.

2. *Pradhan Mantri Gram Sadak Yojana (PMGSY)*

Rural, urban, and some other hinterland roads are some of the most important projects undertaken by the government of India. Pradhan Mantri Gram Sadak Yojana is one of the significant connectivity schemes introduced by the government of India for connectivity in Rural India. This facilitates the opening of a network from areas to major highways.

Under Pradhan Gram Sadak Yojana, 99% of targeted habitations have been provided with all road connectivity. Since its inception, almost 700,000 km of road length has been completed.

Vertical	Sanctioned			Completed		
	No. of Roads	Road Length (in km)	No. of bridges	No. of Roads	Road Length (in km)	No. of bridges
PMGSY-I	1,64,806	6,45,605	7,516	1,59,783	6,13,030	5,864
PMGSY-II	6,700	49,885	765	5,755	46,468	562
RCPLWEA	1,030	10,231	463	363	5,310	135
PMGSY-III	9,972	77,129	708	1,984	29,773	96
Total	1,82,508	7,82,850	9,452	1,67,885	6,94,581	6,657

The total number of roads and bridges sanctioned and completed under this scheme.

3. *State Highway Initiative*

Not only is the central government responsible for the construction of highways, but it is also the state's government responsible for the construction of the highways connecting interstate highways in their respective state. The state governments not only use their financial resources but also receive financial assistance from international lending agencies such as the World Bank.

4. *Bharat Mala Pari yojana Program*

In addition to 10,000 km of current NHDP projects, the Bharat Mala Pari Yojana was introduced in 2017 and connects around 600 districts nationwide; several scientific studies, such as freight movement and

crow-flight alignment, were conducted thoroughly to reduce transit time. Various new-age technologies, such as automatic traffic surveys and satellite mapping, were deployed to identify the upgradation of the corridors.

Bharat Mala mainly focuses its 24,800 km length of proposed projects on constructing dedicated expressways, accessing controlled economic corridors, coastal and port connectivity, and border and international connectivity corridors.

Sr. No.	Scheme	Length (km)	Cost (Rs. crore)
1.	Economic Corridors	9,000	120,000
2.	Inter-Corridors & feeder roads	6,000	80,000
3.	National Corridor Efficiency improvement	5,000	1,00,000
4.	Border and international connectivity roads	2,000	25,000
5.	Coastal & port connectivity roads	2,000	20,000
6.	Expressways	800	40,000
	Sub Total	24,800	3,85,000
7.	Sub Total	10,000	1,50,000
	Total	34,800	5,35,000

Source: <https://nhai.gov.in/#/bharatmala-parivojana>

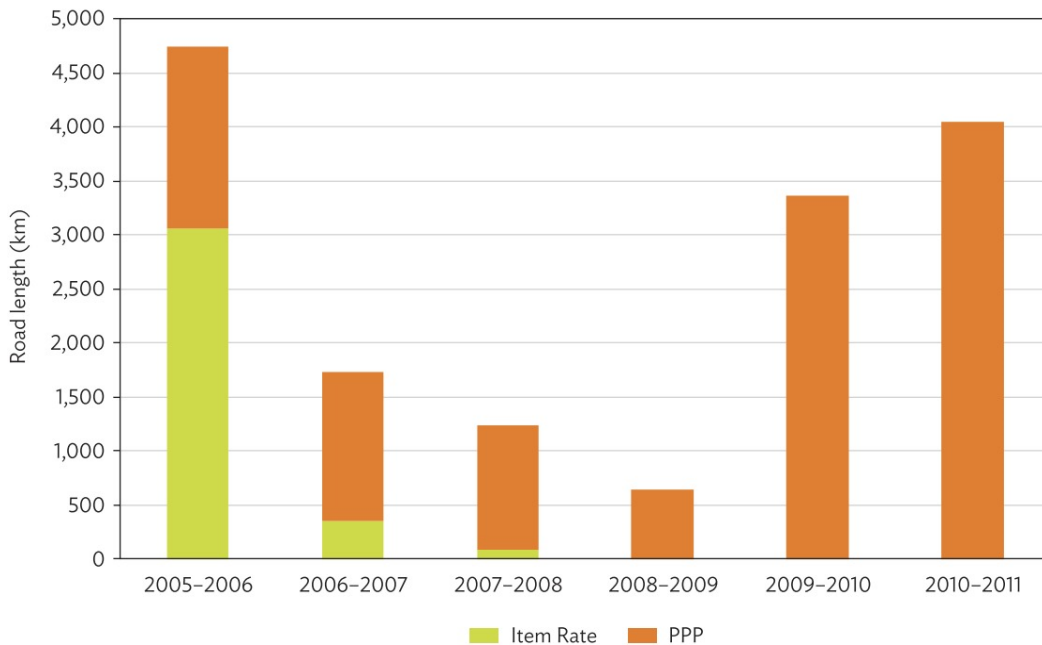
Key feature: Development of 25 greenfield expressways and access control corridors of over 9,100km in length with an estimated cost of Rs. 3.84 lakh crores.

The goal of the Bharat Mala project was set for completion by 2022 when it was first announced in 2017. However, the most recent reports indicate that the project is far from finished due to rising land costs, an increase in the project's estimated budget, and other economic factors.

Modes of contract

Engineering, Procurement, and Construction (EPC) Model: EPC could be considered as a traditional model of making payment by the government to the developer, where the government on the procurement of raw material and construction costs are met on reaching a specific target, the government makes the payment to the developer regularly. In this private sector, participation is minimal in terms of financing.

In the initial development stage, engineering procurement and construction contracts were offered as a traditional way of offering contracts to contractors. With progress in time, it started involving private sectors by awarding long-term contracts with some allowance, involving variants of BOT (Build, Operate, and Transfer); the transition can be explained by referring to the data graph below.



km = kilometer, PPP = public-private partnership.

Source: Department of Economic Affairs, Government of India. PPP in India: <https://www.pppinindia.gov.in/>.

Transition to Public-Private Partnerships in National Highways

To emphasize on BOT projects, it can be classified into three types:

1. BOT Toll Projects
2. BOT Annuity Projects
3. The Hybrid Annuity Model (HAM)

1. BOT Toll Projects: A road developer develops the road and can recover the investment through toll collection in this model. The toll collection will be over a period per the contract between the private entity and the government.

(Note- There is no government payment to the developer in this type of contract. The developer must earn through the revenue collected at the tolls).

2. BOT Annuity Model: In this model, the developer constructs the highway, operates it for a specified period, and then returns it to the government. The developer is expected to collect its payment after the launch of the project's commercial operation. The payment will generally be made on a six-month basis or according to the agreement between the developer and the client (i.e., the government).

3. The Hybrid Annuity Model (HAM): The government of India 2016 came up with a combination of both EPC and BOT Annuity Model called the Hybrid Annuity Model. The main intention of NHAI behind the model is to leverage the developer's or the contractor's balance sheet and ease the contractor's investment by avoiding complete private investment. The advantage of HAM is that it provides enough liquidity to the developer by sharing financial risk. In the case of the BOT Toll Model, the developer must bear complete financial risk. This model was a game changer and has run successfully over the past seven years.

As per the design of this model, in the first five years, 40% of the project cost will be made by the government through annual payments, and the remaining 60% will be paid as a variable annuity amount

after the completion of the project depending on the value of assets created, the rest 60% which the developer has invested is raised in the form of equity or by taking loans.

The GOL (Government on Line) has considerably pushed infrastructure by allocating \$1.4 Tn to be invested until 2025.

The market for roads and highways in India is projected to exhibit a compound annual Growth Rate (CAGR) of 36.16% during 2016-2025 due to growing government initiatives to improve transportation infrastructure in the country. The highways sector in India has been at the top of performance and innovation. The government has successfully rolled out over 60 road projects in India worth over \$10 bn based on the Hybrid Annuity Model (HAM). HAM has balanced risk appropriately between private and public partners and boosted PPP activity in the sector.

Financing of highway/road development

To provide a brief history of financing over the last 20 years. In the early 2000s, the funding for the development of highways came in the form of the Central Road Fund (CRF). The revenue collected for the Central Road Fund heavily relied on the tax imposed on the consumption of petroleum products such as petrol and diesel.

The financing of revolutionary projects such as Pradhan Mantri Gram Sadak Yojana and NHDP could be credited to the central road fund. CRF was also used to develop ROBs (Rail over and under bridges).

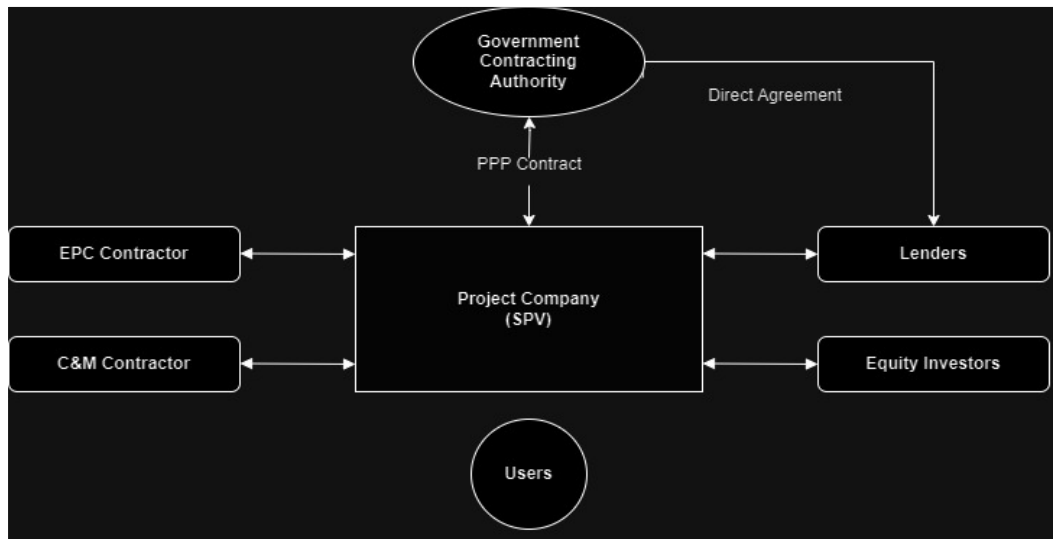
Over the years, the importance of CRF (Central Roads Fund) as a financing source was reduced with the emergence of PPP models in India. With a shortage of funds and the need for exponential development of roads, the government decided to allow the flow of private investments in the form of PPP models.

- **Shareholders of the PPP model:**

In PPP projects, the equity investors hold the position of project shareholders. The equity investors may be project developers, infrastructure management companies, or construction companies.

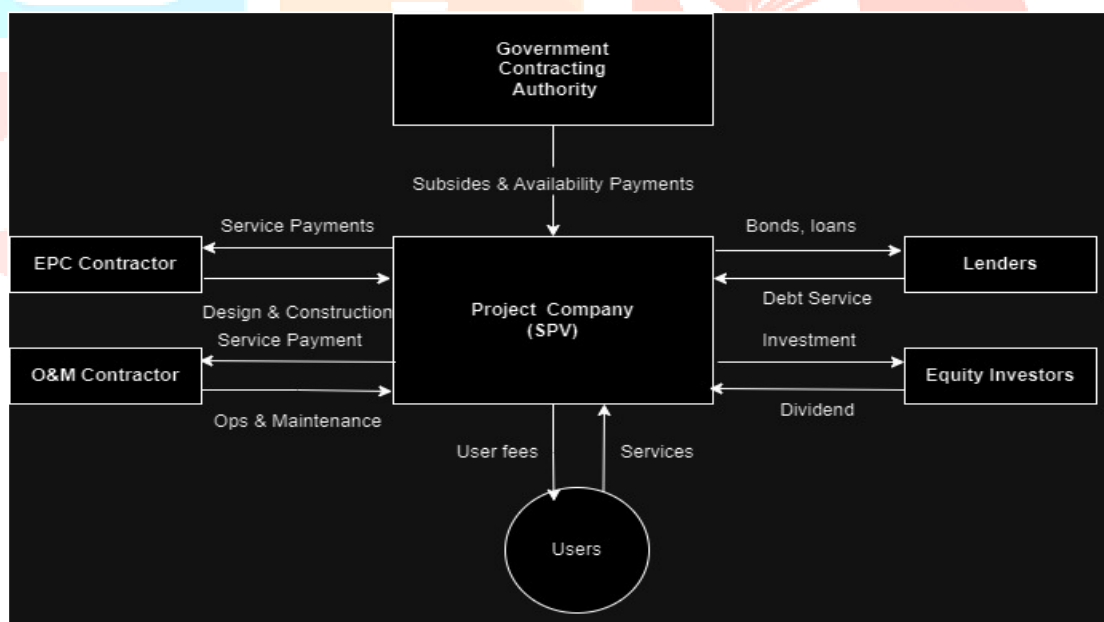
The equity investors form a company, often called a particular purpose vehicle (SPV), and raise finance through a combination of equity and debt provided by banks, bonds, and other financial instruments.

They are also known as lenders. They may be commercial banks, bilateral development banks, or institutional investors such as pension funds and insurance companies. Typically, the PPP structure could be understood by the following diagram.



From the above diagram, it could be understood that the company further contracts the project with firms to manage design and construction, also known as EPC contractors, and operation and maintenance. These contractors are directly linked to the equity investors. In some cases, not just the private developer pledges the equity, but also the subcontractors and suppliers lend support to the private developers by selling the assets so that in the binding stage of the project, they get preferential status upon the award of the project.

The flow of funds:



Drawbacks of PPP models:

- Stringent policies of banks or any other form of financial institution towards the shareholder can seriously harm projects regarding financial flow.
- Due to tedious competition while bidding, the developers might be discouraged from taking a chance because of the low investment ratio to future returns.
- Instability of the market and inflation over a period can seriously reduce the profit margin, burdening the investor with excess investment and paying the interest to the lenders.

Considering the setbacks faced by the equity holders of PPP projects, the government or the client should develop initiatives like HAM wherein the contracts could be tailored in accordance with the condition, such that both the client and the developer should benefit.

India has come a long way in the last three decades; with the help of credible data, we can assert that there has been exponential growth in the Indian Road Networking System. As of 2022-23, India has 1,45,340 km of national highways, up from 1,01,011 km in 2013-14.

Nitin Gadkari, the union minister of roads, transportation, and infrastructure, stated on Tuesday that the length of the nation's national roadways had expanded by almost 59% during the previous nine years. It is estimated that by 2025, at least 26 green expressways will be constructed to facilitate efficient freight movement and are expected to reach a total length of 1,80,000 km.

