

# Traffic revenue risk management through Annuity Model of PPP road projects in India

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## Abstract

The Government of India has been promoting involvement of private entrepreneurs in development of road projects with a focus on overcoming the limitations of the traditional public procurement system. Participation of private entrepreneurs through Public–Private Partnership (PPP) route brings in additional capital and imparts techno-managerial efficiency in the project development and operation. The success of projects procured through PPP route greatly depends on the transfer of risks associated with the project to the parties best able to manage the risks. The traffic revenue risk has been identified as one of the most critical risks impacting the commercial success of the Indian road projects procured through PPP mode. Private sector's reluctance to assume traffic revenue risk and lack of users' willingness to pay have led to development of innovative contractual structures, such as Annuity Model. This paper discusses the Annuity Model with the help of a case study. Annuity Model is a traffic risk-neutral PPP model where private investment by the project promoters in designing, constructing, and operating the facility is recouped with the annuities paid by the granting authority over the concession period.

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## 1. Introduction

Roads play a pivotal role in the economic development of a nation, by increasing the productivity and competitiveness [1]. The Indian Central Government and the state governments realizing the importance of the road network in economic development have taken numerous initiatives to improve the national road network, both in terms of upgrading the quality and augmenting the magnitude, to keep pace with the demands dictated by the economic liberalization. Innovative delivery systems have been devised to overcome the shortcomings like budgetary constraints, and weakness in planning and implementation of the road

projects related with the traditional public procurement system [2]. The Build Operate Transfer (BOT) approach has been most commonly used to implement road projects in the Public Private Partnership (PPP) mode. This approach brings additional resources to fill the fiscal gap, assists in transfer of technical know-how, and imparts efficiency in project procurement and operation through the involvement of private sector.

The procurement of PPP road projects evolves through project development, construction, and operation. The private parties' investment in the project through development, construction, and operation of the project is recouped with the returns in the form of either user's fee or grant. The certainty within which the private parties' investments will be recouped is influenced by the various risks associated with the different phases of the project. The traffic revenue risk has been identified as one of the most critical risks impacting the commercial success of

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the road projects procured through PPP mode in India [3]. Private sector's reluctance to assume traffic revenue risk and lack of users' willingness to pay in developing countries, like India, have led to development of innovative contractual structures to transfer traffic revenue risk to the parties best able to manage it and ensure greater private sector participation.

The institutional and regulatory reforms undertaken by the Indian Central and state governments were reviewed to underscore the initiatives taken by the governments to create an enabling environment for private sector participation in road sector. In spite of the reforms, poor response of the private investors to participate in projects procured through pure BOT model led to development of different variants of PPP. Annuity-based BOT model has been one of the models. In this model, traffic revenue risk is allocated to the public entity. The contractual, qualitative risk allocation, payment mechanism, and concessionaire selection frameworks of this model are discussed in detail in this paper. The details of this model were drawn and analyzed through qualitative research using documentary evidences from multiple sources of an Annuity-based BOT road project in Indian National Highways Development Programme. This model has also been critically examined to identify the limitations, which can offset the benefits of private sector participation, so that authorities contemplating replication of this model elsewhere are aware of these limitations. It is perceived that this paper will be useful in assisting replication of this model in other developing countries experiencing poor private sector participation in road development programmes due to reluctance of private sector to assume traffic revenue risk.

## 2. PPP road projects in India

The Government of India (GoI) has initiated economic liberalization and globalization since 1991. Inadequacies in the national road network, both in terms of magnitude and quality, have been identified as one of the hurdles to economic growth [4]. The Central Government and the state governments have undertaken structural reforms to overcome the hurdles. The inefficiency of the traditional public procurement framework to keep pace with the demand created by economic growth has prompted policymakers to involve private sectors and change the role of the government from 'creator' to 'facilitator' of transport infrastructure.

The road network in India comprise of National Highways, State Highways, District Roads, and Village Roads. Development and maintenance of the National Highways have been under the jurisdiction of the Union Government through Ministry of Shipping, Road Transport and Highways (formerly Ministry of Surface Transport). The Indian Parliament constituted the National Highways Authority of India (NHAI) with the enactment of National Highways Authority of India Act, 1988. NHAI, which was put into operation in February, 1995, has been responsible for the

development, maintenance, and operation of National Highways [5]. The Government of India has further reformed the legal framework and paved the way for private sector participation in development of National Highways with the amendment of National Highway Act, 1956 in June, 1995 [6]. This Act has enabled the private investors to levy toll and allowed participation in construction, maintenance, and operation of National Highways [7].

Since, the Government of India had decided in April, 1995 to involve private sectors in road development, several institutional reforms and fiscal incentives have been introduced, besides the legal reforms, to encourage private sector participation. The key broad and road sector-specific institutional reforms, and the fiscal incentives introduced are highlighted below [8,9]:

- Road sector has been accorded the status of an industry via Section 18 (1)(12) of the Infrastructure Act.
- Establishment of Infrastructure Development Finance Company (IDFC) to meet the long-term financial needs of the infrastructure sector. IDFC, among other things, will act as a direct lender, refinancing institution, and provider of financial guarantees.
- The Government of India has initially permitted automatic approval for foreign equity participation up to 74% in construction and maintenance of highways, roads, tunnels, etc. Foreign equity participation up to 100%, subject to a ceiling of INR 15 billion (approximately US\$ 300 million), has been allowed through a subsequent revision.
- Highways projects involving widening of existing highways are exempted from environmental and forest clearances.
- Announcement of guidelines for development of road projects through Build–Operate–Transfer approach has been made. These guidelines were meant to simplify the procedures concerning initial feasibility studies, acquisition of land, relocation and resettlement of affected establishments, environmental clearances, and equity participation in the highway sector.
- PPP project promoters are allowed to raise external commercial borrowings up to 30% of the project cost.
- Model concession agreements for projects costing of less than INR 1 billion (approximately US\$ 20 million) and for projects costing more than INR 1 billion (approximately US\$ 20 million) have been finalized. These will ensure uniformity in the various agreements for PPP road projects.

The Government of India constituted an Infrastructure Task Force in October, 1998 subsequent to the announcement of construction of North–South and East–West (NSEW) corridors [10]. The Task Force also recommended the need for connecting the four metro cities of Delhi–Mumbai–Chennai–Kolkata–Delhi, termed as Golden Quadrilateral (GQ), where the intensity of the traffic is highest. The Government of India formally launched the

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