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# Hybrid Annuity Model (HAM) Road Project

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**ABSTRACT:** The recent introduction of Hybrid Annuity Model (HAM) for highway up gradation projects in India marks a significant policy departure. This is aimed at revitalizing private sector led infrastructure development. The model has been pitched as a panacea to the numerous ills plaguing the highway sector, which had led to a record fall in the award of new projects, both in numbers and in value. Taking a dispassionate look, this paper critically examines the extent to which HAM has fulfilled its stated objectives during its introductory stage. The analysis of project award data provides mixed empirical evidence of HAM's initial success. We find that as a development imperative, HAM does encourage private participation in highway infrastructure, and it is a step forward. However, HAM also suffers from extensive de-risking of the private sector to the extent of making them unattractive for both debt and equity investment. By this, HAM takes the re-engagement of private sector two steps back. We concede that HAM is still in its infancy and a true performance would.

only be evident once enough number of projects have been delivered through this model. With this view, this paper adopts a more analytical stance, to identify possible pitfalls based upon the tell-tale signs. This is important as infrastructure projects have a long-life cycle, and an early-stage dispassionate analysis and course correction is necessary, lest we move too far down the wrong path.

## I. INTRODUCTION

Roads are an important asset of country, as the country moves on them. Roads carry about 67% of freight and 88% of passenger traffic in India and it is estimated that the road traffic has been growing at 10-15% per annum. India has the 2 largest road network in the world with over 5.23 million km at present, consisting of National Highways, Expressways, State Highways, Major District Roads, Other District Roads and Village.

Among the roads, highways are considered to be more important as they connect different parts of the country and also with other border countries.

As the name suggests, **HYBRID ANNUITY MODEL (HAM)** a hybrid — a combination of the EPC (engineering, procurement and construction) and BOT (build, operate, transfer) models. Now, HAM combines EPC (40 per cent) and BOT-Annuity (60 per cent). On behalf of the govt, NHAI (National highway authority of India) releases forty per cent of the entire project value. It is given in 5 tranches joined to milestones. The balance sixty per cent is organized by the developer. Here, the developer typically invests additional [less| no more] than 20-25 per cent of the project value (as against forty p.c or more before), whereas the remaining is raised as debt. There are no toll rights for the developer. Under HAM, Revenue collection would be the responsibility of NHAI.

Here, the govt pitches in to finance forty per cent of the project value — a form of viability-gap funding. This helps cut the general debt and improves project returns. The regular payment structure means the developers aren't taking 'traffic risk'. From the Government's perspective, it gets a chance to flag off road comes by finance a little of the project value. While it will take the traffic risk, it additionally earns higher social returns by manner of access and convenience to daily commuters.

Advantage of HAM is that it gives enough liquidity to the developer and the financial risk is shared by the government. While the private partner continues to bear the construction and maintenance risks as in the case of BOT (toll) model, he is required only to partly bear the financing risk. Government's policy is that the HAM will be used in stalled projects where other models are not applicable.

HAM could be a sensible trade-off, spreading the risk between developers and the Government.

## II. LITERATURE REVIEW

- **Hybrid annuity model: Hamming risk allocations in Indian highway public-private partnerships**  
Article in Journal of Public Affairs · January 2019

- **Abstract:** The recent introduction of Hybrid Annuity Model (HAM) for highway upgradation projects in India marks a significant policy departure. This is aimed at revitalizing private sector led infrastructure development. The model has been pitched as a panacea to the numerous ills plaguing the highway sector, which had led to a record fall in the award of new projects, both in numbers and in value. Taking a dispassionate look, this paper critically examines the extent to which HAM has fulfilled its stated objectives during its introductory stage. The analysis of project award data provides mixed empirical evidence of HAM's initial success. We find that as a development imperative, HAM does encourage private participation in highway infrastructure, and it is a step forward. However, HAM also suffers from extensive de-risking of the private sector to the extent of making them unattractive for both debt and equity investment. By this, HAM takes the re-engagement of private sector two steps back. We concede that HAM is still in its infancy and a true performance would only be evident once enough number of projects have been delivered through this model. W

With this view, this paper adopts a more analytical stance, to identify possible pitfalls based upon the tell-tale signs. This is important as infrastructure projects have a long-life cycle, and an early-stage dispassionate analysis and course correction is necessary, lest we move too far down the wrong path.

## III. METHODOLOGY

At a conceptual level, HAM proposes to introduce a new regime that is very different from the BOT regime. In BOT, construction and operation of infrastructure are bundled and handed over to the private sector for fixed period, with the users obligated to pay toll charges for the superior services that they avail. This seeks to address the large public infrastructure gap, while creating additional value by exploiting private sector's delivery efficiencies. In contrast, HAM has emerged with the recognition that it is the government which should ultimately pay for building the public infrastructure. The model continues to rely on user payment for infrastructure delivery, with the government being the key intermediary. The fundamental difference lies in the government undertaking the responsibility of charging user fees in HAM and reimbursing the private sector over time for the investments that it had made. At the policy level, HAM is motivated by three reasons. Firstly, it aims to address the problem of damp squib in BOT bids, which was the result of over-leveraged balance sheets of the concessionaires. Secondly, it proposes to de-risk concessionaires by reallocating project risks and emphasizing that in PPPs the risks need to be borne by the party best able to manage it (Prata, 2015). Consequently, the government got obliged to take over many of the project risks. Thirdly, it aims to free up private sector capital and equipment for deployment in fresh infrastructure projects, by reducing private sector equity commitments.



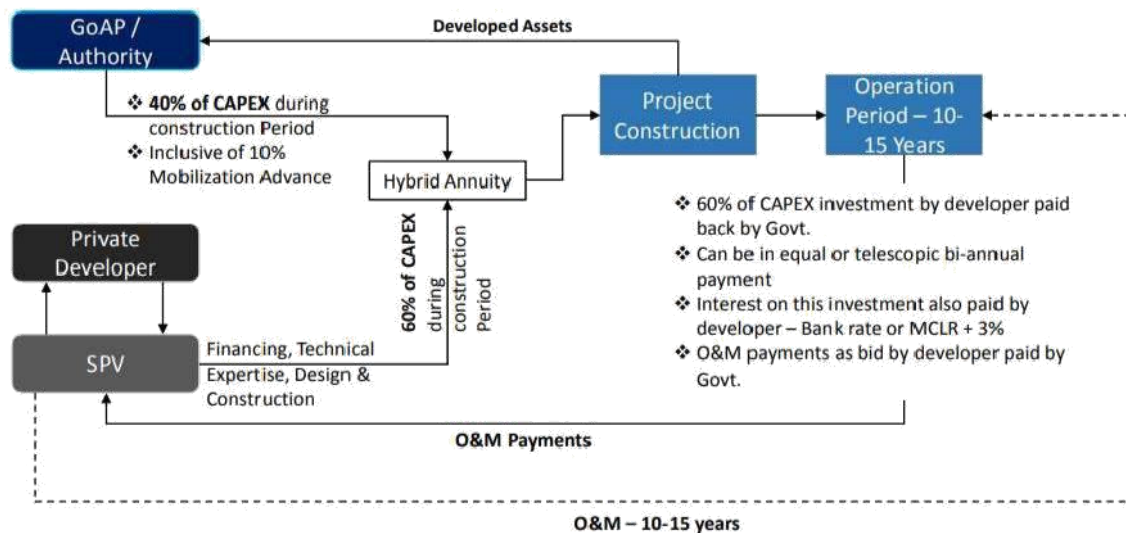
Fig no-1 project implementation

As shown in the figure above, approximately 36.71% of total projects under implementation during FY 2016-17 pertained to Road Transport & Highways. These projects are being handled by the Ministry of Road Transport and Highways (Roads Wing), National Highways Authority of India (NHAI), State PWDs, and Border Roads Organization (BRO).

Thus, in reference to the development of the national highways in India the government has decided to introduce HYBRID ANNUITY MODEL (HAM) to revive PPP (public private partnership) in highway construction. At present, three different models – PPP Annuity, PPP Toll and EPC (Engineering, procurement & construction) were followed by the government while adopting private sector participation. HAM arose out of a necessity to own a more robust money mechanism for road development. The larva model saw roadblocks with personal players nearly forthcoming to speculate. First of all, the personal player had to completely organize for its finances — be it through equity contribution or debt. NPA-riddled banks were turning into cautious of disposition to those comes. Also, if the compensation structure didn't involve a hard and fast compensation (such as annuity), developers had to require on the complete risk of low rider traffic.

In the past, several assumptions on traffic had gone awry touching returns currently, they are unwilling to commit large sums of money in such models.

HAM could be a sensible trade-off, spreading the risk between developers and the Government. Here, the govt pitches in to finance forty per cent of the project value — a form of viability-gap funding. This helps cut the general debt and improves project returns. The regular payment structure means the developers aren't taking 'traffic risk'. From the Government's perspective, it gets a chance to flag off road comes by finance a little of the project value. While it will take the traffic risk, it additionally earns higher social returns by manner of access and convenience to daily commute



**Fig-2 Developed Block-diagram provides an overview of the HAM Model.**

Following are the important points of HAM.

1. In the previous build, operate and transfer model, the concessionaire had to manage the financing risk, revenue risk, operation and maintenance risk in addition to the construction risk and the government was only responsible for managing right of ways and granting toll collection rights to the concessionaire. Under HAM, the revenue risk is being borne by the government; part of financial and operating risk is being borne by the government.
2. As the infrastructure development has slowed down, hybrid annuity model has been implemented. Within 3 – 4 years, government financing through short term budgets and long-term annuity will get stressed. This is evident from the fact of selling of stressed project assets. However, it will take time of 3 – 4 years.
3. Also, all the nationalized banks lending to infrastructure is restricted due to imposition of sectorial caps and due to rising non-performing assets. Hence these banks will not be able to lend for infrastructure for coming two to three years.
4. Under the new hybrid annuity model the responsibility of the contractor is only to arrange 60 % of the project cost. However also for this 60% promoter will only bring 25 – 30 % of own equity and rest would be financed by debt.
5. Infrastructure group's balance sheet is stressed and over leveraged. Banks are not willing to



lend because of their rising nonperforming asset due to poor financial position of the infra groups. Also, these groups don't have the ability to bring further equity. The above issue of equity can be solved if banks and financial institution agree to finance whole 60% of the project costs as the bank guarantees the annuity payment.

6. Another issue with HAM is over pricing. The contractor takes into consideration the

promoter's equity loan, project duration and profit on promoter's equity and operation and maintenance cost. It is observable that projects under HAM are priced 25 to 30 % more than under EPC. Ultimately it will result into high annuity payouts and government will be forced to charge higher toll.

8. However, collecting higher toll revenue is not easy for the government. Recently the government in Mumbai had to close many small projects because of the political pressure and government is now struggling to compensate the concessionaire.

9. The rates provided for operation and maintenance costs are although sufficient for maintenance of good quality roads for long term. But the problem of axle overloading is a commonly observed phenomenon. Contractors believe it to be the root cause of road damage and ultimately it results in higher operation and maintenance cost.

10. The problem of operation and maintenance costs can become a serious issue. Sometimes, a contract might not out carry out the repair of damaged roads or may claim heavy costs. However, the operation and maintenance costs are delinked with annuity payments. But, due to the inability of the contractor for maintenance of road, it may attract penalty.

11. The problem of toll collection is severe in India. Build, operate and transfer model reported.

15 – 20 % leakages due to demands by various groups. The concept of paying fully for the public utilities is not accepted in India till yet. There are certain weaker sections of the society. Under HAM, government is responsible for toll revenue collection and government is well equipped to deal with it.

#### IV. FEATURES OF HAM

HAM aims to achieve the "best of both the worlds", by combining elements of BOT, and EPC – the extant models of private participation for highway development in India. However, in its early stages of adoption an evaluation of the extent to which HAM is able to achieve the respective advantages of BOT and EPC models remains to be examined, and we attempt the same.

**1. Bid parameter:** Project life cycle value outlined as net present value (NPV) of the quoted bid project value and NPV of the operations and maintenance (O&M) value for the entire operations period is the bid parameter. Bid is awarded to the developer quoting lowest NPV for project life cycle value.

**2. Cash Construction Support:** forty percentage of the bid project value shall be awarded to the concessionaire by the authority in 5 equal installments coupled to physical progress of the project. Concessionaire shall need to at first bear the balance 60% of the project value through a mix of debt and equity.

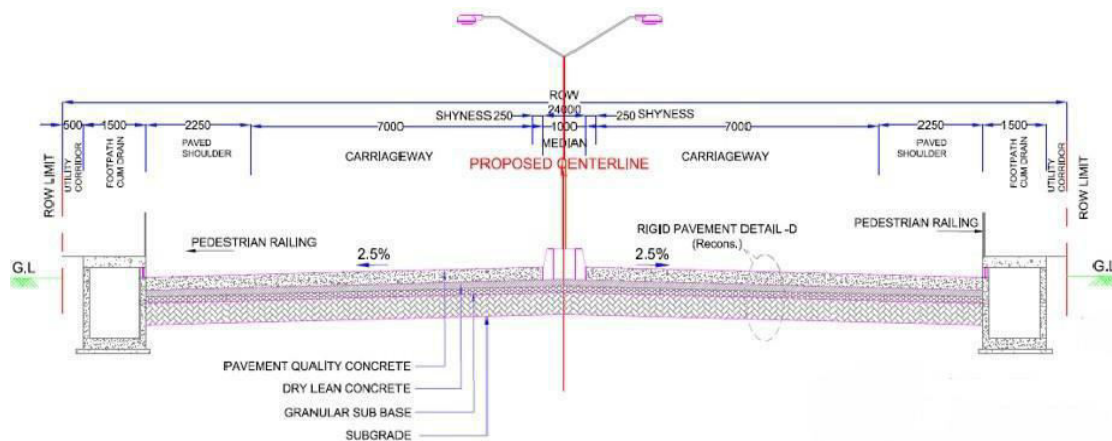
**3. Escalation clause within the project cost:** Project cost shall be inflation indexed (through an index number Multiple) (PIM), which is the weighted average of Wholesale Price Index (WPI) and Consumer index number (CPI) (IW) within the quantitative relation of 70:30. The bid project value adjusted for variation between the value index occurring between the reference index preceding the bid date and reference index date like a shot preceding the appointed date shall be deemed to be the bid project value at commencement of construction. Bid project value shall be modified to variation in PIM on monthly basis until the accomplishment of business operations date (COD).

**4. Stable cash flow of annuity payments:** Semi-annual annuity payments shall be created to the concessionaire by the Authority on completion of the project for the balance hour of the final bid project cost. The payments are aligned with typical revenue profile for road comes. Along with the annuity payments, interest shall be paid within the kind of grant on reducing balance of ultimate construction value. Interest rate for constant shall be discount rate + three nada (currently ten % per annum).

6. **Assured O&M payouts by authority:** O&M payments shall be created to the smallbusinessman in conjunction with rent by the Authority, in accordance with the quantity quoted which can be inflation indexed. Concessionaire shall stay accountable for the upkeep of the project until the tip of the concession amount. **Revenue for authority:** Toll assortment shall be the responsibility and revenue of the authority.

7. **Concession Period:** It shall comprise construction amount, which shall be project specific, with a set operation amount of fifteen years.

#### EXAMPLE OF TYPICAL CROSS SECTION OF ROAD



cross sec no-1

#### V. CONCLUSION

In an effort to improve the highway network in India, GOI introduced the National highway development plan (NHDP) in 1997 to develop the NH through PPP model. But, due to large number of stalled projects under PPP model due to financial instability, GOI has introduced Hybrid Annuity Model (HAM) in Road development to rejuvenate PPP. The objective of the present study was to understand the various features and latest trends of HAM in road sector in India, to accomplish this objective we compared the HAM with the conventional DBFOT model of highway development, so as to extract the advantages and risk associated with HAM. Firstly, a brief introduction of road development programmed like public private partnership (PPP) in India is presented. Then the Paper describes the various clauses and attributes of HAM. Then, the DBFOT and HAM are compared to identify the advantages and risk associated with HAM model both for NHAI and contractor prospective. Furthermore, we identify that, HAM is one of the potential solutions for road development as it distributes the financial risk between government and the private players.

. HAM is expected to benefit the road sector with the increase in the pace of award of contract and addressing the drawbacks of the earlier toll based and annuity-based projects.

The roads and highways play an important role in development of the country. Various steps have been implemented by Indian government to enhance the present state of road network in the country. Public Private Partnership (PPP) has been the officially accepted methodology by the Government of India for expansion of road network amongst which the BOT (Toll), BOT (Annuity), EPC, HAM are the most commonly used model for awarding the projects. However, the model suffers from various inadequacies and need improvements for effectiveness which are listed below.

From this work, firstly it can be deduced that delay in PPP project is due to various factors among which prominently influential factors are funding through government and lack of transparency. The roads and highways play an important role in development of the country. Various steps have been implemented by Indian government to enhance the present state of road network in the country. Public Private Partnership (PPP) has been the officially accepted methodology by the Government of India for expansion of road network amongst which the BOT (Toll), BOT (Annuity), EPC, HAM is the most commonly used model for awarding the projects. However, the model suffers from various inadequacies and



need improvements for effectiveness which are listed below. From this work, firstly it can be deduced that delay in PPP project is due to various factors among which prominently influential factors are funding through government and lack of transparency. Secondly, financial risk is the most strongly rated risk faced in implementation of any PPP project. Thirdly, funding of HAM projects can be a challenge for government in short span of time and can also be considered as reason of delay in such projects and can lead to overall project delay of around 20%.

Due to inefficient revenue management necessary modifications should be done on financial parameters in order to make the existing HAM model more effective. The alternative model which can be taken into consideration is Toll Operate Transfer (TOT).

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