

Study on Different Types of Tenders, Tender Qualification/ Processing, Quantitative Techniques for Tendering, Planning and Monitoring

Manoj Kumar¹, B. Hemanth Roy²

¹Assistant Professor, Department of Civil Engineering, Sri Ramakrishna Institute of Technology, Coimbatore - 641010, India.

²PG Student, Department of Civil Engineering, Sri Ramakrishna Institute of Technology, Coimbatore- 641010, India

Abstract— Indian construction industry has played a vital role in the process of economic transformation and furtherance for over five decades and is the primary input for the socio-economic development of the country. Increasing complexity in design and involvement of numerous stakeholders in modern construction projects are huge challenge for both clients and contractors to meet criterion of skills and capabilities required to successfully deliver a project at bidding stage. Implementation of HAM (Hybrid- Annuity Model) to revive investments in road infrastructure projects, HAM has seen good initial success. About 30 highway projects have been awarded under HAM by the National Authority of India (NHAI) at a total cost of about 28,000crore. Half the projects awarded in HAM. This paper summaries the key changes and features which are brought under the new arrangement and provides a comparison with pat models.

Keywords— tender notice, Hybrid Annuity Model, stakeholders.

I. INTRODUCTION

In India, road projects are awarded via one of the three models: Build-operate-transfer (BOT)- Annuity, BOT-Toll, EPC(Engineering, procurement and construction) contracts. After the BOT model of public private partnership (PPP) an advanced version of Model Concession Agreement (MCA), presently called as Hybrid Annuity Model is paving way for road projects. The Hybrid Model is supposed to be win-win situation for the Government and Developers. The government is expected to fund up to 40% of the project cost while remaining 60% to be funded by the private player, and thus easing the financial burden on the exchequer as well. This comes as a welcome step in the situation of dismal performance of highway construction projects awarded under MCA.

1.1 Background

The revised Model Concession Agreement (MCA), now called as Hybrid Annuity Model

(HAM) is a welcome change over all the previous Build Operate Transfer (BOT) model of Public Private Partner-ship (PPP).

Since the new union government took over in May, 2014 the question of languishing BOT projects was on top priority due to dismal performance of high-way construction projects awarded under existing model concession agreement. In very short time, the government came up with new HAM to ad-dress the various concerns felt by the stakeholders. By now first 2 projects are being awarded and more projects under same model will be awarded in coming months.

In last decade, many variants of PPP were experimented. Commonly adopted models were BOT with toll and BOT with annuity. Some early projects were awarded with success, mainly connecting important cities with steady and growing traffic. But soon it was clear that in some road segments may not have adequate toll paying traffic thus requiring partial government support. This was achieved through offering Viability Gap Funding (VGF) from 20% to 40 % of project cost and the Contractor asking for minimum VGF Grant could get the project. While experimenting with this VGF model, Government realized that some road connecting important cities had good prospects of collecting toll more than required for recovery of investment including interest and profits. This resulted into negative grant i.e. Contractors were willing to give money to government for awarding the project and those paying highest grant to government could get project awarded to them. More than 10-12 projects were awarded on these lines, perhaps due to over-enthusiasm of Contractors to get the projects. But soon

it was clear that reality was not rosy and Contractors started backing out of project, by returning the concession granted to them.

Still there were few projects in remote areas, which were not commercially viable due to their poor toll collection prospects. For such projects government decided to offer 100% support, by annuity payment over the concession period and the Contractor asking for lowest annuity was awarded project without toll collection responsibility. This idea was well received due to assured annuity without the responsibility of collecting toll. But soon Government felt that such annuity payment for large number of projects will create a permanent burden of annuity payout in all future budget and they decided to discontinue with this model unless very essential in rare cases.

In all this process, awarding of road construction projects slowed down. However to keep some nationally important linkage in remote areas going and to give some push to road construction, EPC/Turnkey projects were awarded with full payment by Government for construction, without any deferred payouts mechanism, to revive the road sector.

Hence all these combinations of payment arrangement needed a relook, as many of these were not working well and contractor stopped quoting for new BOT projects, due to various risks they were facing in the previously awarded projects.

1.2 How HAM is different?

The key changes and features which are brought in HAM MCA are summarized below. In general, HAM has brought in welcome change in the business environment due to the positive orientation of the government with a business friendly approach to achieve the speedy execution of long delayed highway projects.

The previous BOT model has structured the risk sharing with a major responsibility on the Contractor, managing financing risk, revenue risk and O&M risk apart from usual construction risk and government (or NHAI) was required to manage right of ways and granting toll collection rights to the Concessionaire. While in new HAM a dramatic realignment of Risk sharing is brought in. In this model, the government is accepting revenue (toll) collection risk, along with partial sharing (40%) of financial risk, and only expecting Contractor to continue managing execution and O&M risks. This is definitely much better balance compared to past risk allocation. In the process, they have brought in hybrid combination of old Annuity and BOT model and also EPC contract risks strategies. The brief picture of Risk Allocation can be tabulated as in Table 1.

TABLE 1
RISK ALLOCATION IN DIFFERENT CONTRACT MODELS

Type of Risk Type of Model	Financing risk	Revenue or toll collection risk	O & M Risk
BOT Model	By Private	By Private	By Private
Annuity Model	By Private	By Govt.	By Private
BOT-VGF Model	By Govt. & Private	By Private	By Private
EPC Model	By Govt.	By Govt.	By Govt.
HAM Model	By Govt. & Private	By Govt.	By Private

These changes though welcome are really favorable repackaging of various models in the past. For example, old annuity model was assuring minimum bi-annual release of payment to Concessionaire, with toll collection under government control while in some VGF models, there was willingness to pay up to 40% of Project cost (where toll collection prospects were low in uneconomic or backward areas). Actually both these earlier models were welcomed by construction community, but were discontinued by government because those good features relating to budgetary support to the project were putting financial pressure on short term budgeting and long term compulsions of financing.

This Hybrid combination of earlier ideas is presently welcome, when Infrastructure development has slowed down. However within 3-4 years, government financing may be stressed by necessary short term direct budgetary support to Infrastructure and long term annuity commitment. This is inevitable due to upfront payments required, during execution and long term burden to be accepted in annual budgets for annuity payments over 15-20 years.

Also all nationalized banks' infrastructure related loan books are full or restricted due to either sectorial caps or non-performing loans. Hence though the terms of new HAM models are comforting to the banks, they may not have spare funds for at least 2-3 years to allocate to these hybrid projects which are likely to be awarded now and in the next financial year.

Though this new hybrid model lowers the responsibility of Contractor to 60% of project cost to raise the money, the question of sufficient promoter participation by Contractors with 25 to 30% equity component within 60% project cost will be expected by banks. This would mean arranging of 15 to 18% participation of overall project cost by promoters before the balance amount of 40 to 45% are granted by public sector banks or financial institutions (private banks have mostly kept away from infrastructure loans).

It is well known that the balance sheets of most of the leading Infrastructure groups are stressed and over leveraged. They may not have the spare capacity to bring in equity participation in new projects, nor will the banks grant further project funding unless the balance sheets of these groups are deleveraged, by the existing projects or selling the stressed project assets. This will take some time (say 2 to 3 years).

This stress of new equity on Infrastructure groups can be eased; if banks/financial institutions agree to offer full borrowing of 60% of the project costs, since annuity payments are fully secured by government commitment in this HAM model (this really means banks giving loans to infrastructure groups due to government guarantee of annuity payment).

The other concerns expressed by financial experts is about pricing of these projects under HAM. Since Contractors taking up such project will have to line up promoter's equity and loan component of this project, keeping in mind project execution and long term O & M risks, apart from making profit on the promoter's equity, these projects may be priced up at least 25 to 30% more than the price obtainable under full EPC model. This will result into higher annuity payouts and matching higher values of toll which government will have to charge to recover high annuity payouts, which is committed to Promoters.

These expectations of high toll collection may not be easy to recover for any democratically elected government. Recently Government of Maharashtra has to closedown many small and medium size toll collection plazas due to popular political pressure and they are now struggling to compensate the private Concessionaire to honor the contractual commitment made to those Special Purpose Vehicles (SPVs) created by private contractors.

The O & M payouts provided in this model are well identified in new MCA but the rates provided are modest. These amounts might be sufficient for maintaining really high quality road over long period of time. But the problems of quality of construction are complicated due to misuse by road users. It is a common knowledge that axle overloading by all heavy duty road carriers is rampant and axle over-loading up to even 30% is commonly noticed. The construction contractors have argued against this overloading as the cause of road damage and related repair costs, overshooting of O & M costs.

This dispute over appropriate causes for road repair costs during O&M period might become contentious issue in future. Since the O&M payments are modest, Contractors might delay or avoid carrying out proper and timely repairs to the road and make claims about heavy repair costs for reasons beyond their control, such as overloading of designed axle loads. Fortunately, O&M costs are delinked for annuity payment but failure in proper maintenance will attract penalties which might get disputed on the grounds of overloaded vehicles.

The broader issue of toll collection from public with their willingly cooperation is an unresolved problem. However government is well equipped to deal with law and order problem arising out of non-payment of toll by some sections of local community, than a private contractor (some attempts to convert toll into fuel surcharge has not worked since refueling of vehicles is chosen by user far away from toll points).

In recent past, existing companies operating under BOT model have reported toll leakage from 15 to 22 % due to demands from various pressure groups of end-users. The non-cooperation of frequently traveling local people is a well-known problem. The concept of paying end user charges for public utilities created by government or private agencies is not yet fully accepted in India.

Also, economically weaker sections of society cannot bear the full cost of service as they cannot afford it.

For readers who would like to know more about other changes in HAM model and its comparison with provisions in earlier BOT and Annuity models, a detailed risk allocation chart is prepared and attached below. It is conceded that no model (BOT/ Annuity/HAM) can be free from all risks, since executing Infrastructure projects is always about striking a fair balance of risk between the parties who can manage it best, with minimum cost burden.

As per shown in below table.

Risks	BOT Toll	BOT	Hybrid Annuity
Preconstruction			
a) Environment, forest clearances, Right of Ways	Responsibility of Handing over ROW on at least 80% of required area, Environmental protection& Conservations, Forest Clearances will be procured by the Authority.		
Construction Risk			
a) Cost overrun	Concessionaire to bear all risk		
b) Time overrun			
c) Quality			
Financing Risk			
a) Achieving Financial closure in time	Concessionaire to bear all risk		
b) Financing cost overruns			
a) Interest Rate			
b) Repayment			
c) Foreign Exchange			
Revenue			
a) Traffic volume	Shared by concessionaire & Authority. IF average Traffic volume falls below 2.5% of targeted traffic on targeted date (approx. 10 years after start of operations) Concession period is ex- tended by 1.5% per 1% of shortfall. If Actual traffic exceeds the targeted traffic by 1% the Concession period is reduced by .75%.	Not relevant	NHAI to take all risks
b) Toll leakages	Concessionaire to bear all risk	Not relevant	NHAI to take all risks
c) Tariff Rates	Tariff rates are decided as per National Tariff Policy. Hence there is no ambiguity involved. However revenue may reduce if the WPI does not rise as per original expectations of the Concessionaire.	Not Relevant	NHAI to take all risks
d) Competing road	Concessionaire to be compensated suitably if traffic exceed capacity	Not Relevant	NHAI to take all risks
Operations Risk			
a) Annual O&M	Concessionaire to bear all risk		
b) Additional Periodic Maintenance			
Economic Risks			
a) Taxes	Concessionaire to bear all risk		
b) Inflation			
Force Majeure (FM) events			
Time extension			
a) Before Financial closure (Appointed Date)	Time set forth for achieving Financial closure extended by time of FM event		

Risks	BOT Toll	BOT	Hybrid Annuity
b) Between Appointed Date and Commercial Operation date (COD)	Time set forth for Project completion extended by time of FM event Non-political FM: Respective parties to bear the costs. Neither party is required to pay other party		
c) After COD	Concession period extended by time of FM event	...	Concession period not ex-tended. But Concessionaire will continue to receive Annuity
Cost arising out of FM event			
a) Before Appointed date	Cost to be borne by Concessionaire & Authority respectively		
b) After Appointed Date	Non Political Event : Cost to be shared by respective parties Indirect Political event : To be shared Direct Political : Cost compensated by Authority		
Hand Over Risks			
a) Quality of Road	Concessionaire to bear all risk		
b) Default of Concessionaire	Pay 90% of Debts due at that time	Pay 90% of Debts due at that time	During Operations: 65% of debt due; During construction: 50% to 80% of debt due of 9% to 32% of Bid project cost which ever lower
c) Default of Govt. / NHAI	Pay all debts plus 150% of equity	Pay all debts plus 150% of equity	Before COD : All debt due or 9% to 40.5% of PID Project Cost whichever lower plus 150% of equity; After COD: All annuity payments due till transfer date
Other risk			
a) Scope change during any stage	Authority to compensate if change cost increases beyond 0.25% of project cost.	Authority to compensate if change cost increases beyond 0.25% of project cost.	Authority to compensate costs fully

II. LITERATURE REVIEW

Edwin H. Chan, Maria C. Au

This states that the risk for a contractor in sudden increase of material rates as per not given with the risk transfer. Therefore, understanding the factors influencing the contractors pricing of contract risk is crucial for employers to optimize the cost effectiveness of risk allocation in contracts. The factors that contractors perceive to be important when they are pricing time related contract risk.

Aftab Hameed Menon, Ismail Abdul Rahman;

In Malaysian, traditional lump sum system, design and build/turnkey system says that the typical contractual relationship under traditional method in order to take the relation between client with contractor & consultant, and contractor with sub-contractor & supplier. Typical sequence of operations like brief, design, tender, construction. Management procurement:

client with main contractor & consultant and by the same time with workers. Operations of management procurement brief, design, construction.

Tejas C. Patil, Ashish P. Waghmare, P.S.Gawande

The rapid evolution of e-commerce in the past few years has introduced many ways for organizations to perform tendering process and participate in bidding. With a new conceptual techniques by reducing time and cost factor. Buying goods or services or engaging a contract for civil works like building roads, houses, and factories is an important activity. Contractor should develop their own planning, creation and administration in three steps they are:

- Planning department
- Contract creation department
- Contract administration department

Dr. Jim Mason, department of architect

It deals with the topic of Building Information Model with the pace of innovation and need to legal solutions and accommodate new approaches. Intelligent contracts work best were they are of short term or of instantaneous effect. The hypothesis advanced is that certain aspects of the construction contract cannot be fully intelligent and the best that can achieved in short to medium sale of contracts.

Fani Antoniou, Georgious N. Aretoulis

The choice of most appropriate contract type regarding the method of contractor compensation is one of the most essential and complex decision. In addition with the construction process s always technologically complex as it is comprised of numerous task and objectives.

Vladimir Obradovic, Petar Jovanovic

The implementation of this research is important to both project managers who wish to improve their performance and successes rate and organization in their human resource policy.

There is a very high positive correlation between emotional intelligence and professional success.

For recruiting staff to the position of project managers should consider the concept of emotional intelligence. But not only for the project managers has it also revealed to decide on human resource development program.

H. Randolph Thomas, Ralph D. Ellis

Many of the small or medium sized construction companies will show less interest on operational planning. Its better ti develop for prebid plans reduce costs and shorten schedules and improve labor productivity. The planning process consists of eight steps pressingly important for the growth of the company with high profits and minimizing of work load among the labors with their safety vision.

Yong-Cheol Yang, Chan-Jung Park, Ju-Hyung Kim & Jae-Jun Kim

For getting accuracy of work in the site done in the site of day to day progress. These can be done by the means of DPR under the progress of planning department in camp area to the office of client along with the pictures of construction. Through these the client can understand the condition of site in the office itself. But in these article it is explained for a multi- apartment building.

Unmesh. Y.Polekar, Rohit.R. Salgude.

It consists of proper planning and scheduling is most efficient part in completion of project without time lagging and knowing in glance for the material required. And regular monitoring of the project will give satisfactory work for the workers and engineers working in that project. Mainly the planning office should know about the conditions corresponding to the respective manner by using some kind of software techniques.

Md Imran Khan, Maneeth P D, Brij Bhusan S

Its gives the information on the procedures adopted for recording, reporting & collecting information related to the performance of project by the use of DPR and MPR to estimate the progress stage of the project which have to be cross

checked by the prebid scheduling if any lagging of plan should be taken to the view of that engineer to give the corresponding reason and explanation for the delay of work.

Mr. Nilesh D. Chinchore, Prof. Pranay R. Khare

it deals with the construction equipment planning and its uses in very crucial time at which the time management may be rectified by a firm to continue its standards. With these the resource leveling and allocation for different kinds of works with multiple equipment to complete the project in means interval of time. Construction planning aims at identifying construction equipment for executing project task assessing equipment performance capability.

III. CONCLUSION

On collecting data from all aspects of contracts along with their merits and demerits from past years. Among all type of contracts HAM [Hybrid Annuity Model] is the best one to get competitive in present up growing world economy. Is a mix of both EPC (Engineering Procurement and Construction) and BOT (Build Operate Transfer) models? Under EPC model, NHAI pays private players to lay roads. The private player has no role in the road's ownership, toll collection or maintenance (it will be taken by the Government). Under BOT model, private players have an active role they build operate and maintain the road for specified number of year's say 10-15 years. Before transferring asset back to the Government.

Now HAM combines EPC (40 per cent) and BOT (60 per cent). On behalf of the government NHAI releases 40%- 70% of total project cost. All kinds of loan clearance will be taken up by the government. According to different states they were giving % as say in Tamil Nadu is giving 50% as well Karnataka giving 75% (KESHIP) of the total project cost. As per the scope of emergency they were releasing the high percentages. Material escalation will also paid by the government.

From my regarding the HAM method is useful and efficient to attract all competitors in construction industry.

REFERENCES

- [1] **Edwin H. Chan, Maria C. Au: (2012)** How to get the lowest estimate of a bid conformation, Open Journal of Business Management.
- [2] **Aftab Hameed Menon, Ismail Abdul Rahman: (2017)** cost management in construction projects, International Journal of Civil Engineering and Built Environment.
- [3] **Tejas C. Patil, Ashish P. Waghmare, P.S.Gawande: (2016)** tendering process in construction projects, IJSET March(2016)
- [4] **Dr. Jim Mason, department of architect (2015)** new approaches while tendering process, IJSET July(2015)
- [5] **Fani Antoniou, Georgious N. Aretoulis (2013)** different types of contract in highway projects, journal of civil engineering.
- [6] **Vladimir Obradovic, Petar Jovanovic (2012)** role of project managers while tendering process, 26th IPMA world congress Crete, Greece.
- [7] **H. Randolph Thomas, Ralph D. Ellis (2012)** functions of project management, International Journal Of Civil Engineering.
- [8] **Yong-Cheol Yang, Chan-Jung Park, Ju-Hyung Kim & Jae-Jun Kim (2007)** daily work progress in construction projects, Journal of Construction Engineering and Management.
- [9] **Unmesh. Y.Polekar, Rohit.R. Salgude (2015)** planning and scheduling in construction projects, International Journal of Advance Research in Computer Science and Management Studies.
- [10] **Md Imran Khan, Maneeth P D, Brij Bhusan S (2008)** planning techniques in construction, Journal of Construction Engineering and Management.
- [11] **Mr. Nilesh D. Chinchore, Prof. Pranay R. Khare (2014)** selection of equipment's for highway projects. Journal of Engineering Research and Applications.
- [12] **MORTH (Ministry of Road Transportation & Highways)** Revised on 2015.
- [13] **IRC-SP:19-2001**, Indian Road Congress