

THE HYBRID ANNUITY MODEL FOR PUBLIC-PRIVATE PARTNERSHIPS IN INDIA'S ROAD SECTOR

LESSONS FOR DEVELOPING ASIA

Dinesh Shiwakoti and Devayan Dey

NO. 94

August 2022

**ADB SOUTH ASIA
WORKING PAPER SERIES**

ADB South Asia Working Paper Series

The Hybrid Annuity Model for Public-Private Partnerships in India's Road Sector: Lessons for Developing Asia

Dinesh Shiwakoti and Devayan Dey

No. 94 | August 2022

Dinesh Shiwakoti, senior procurement specialist from Procurement Division 1, Procurement, Portfolio and Financial Management Department, strategically placed in South Asia Transport and Communication Division, South Asia Department

Devayan Dey, executive director, Capital Projects and Infrastructure Practice, PwC India



Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO)

© 2022 Asian Development Bank
6 ADB Avenue, Mandaluyong City, 1550 Metro Manila, Philippines
Tel +63 2 8632 4444; Fax +63 2 8636 2444
www.adb.org

Some rights reserved. Published in 2022.

ISSN 2313-5867 (print), 2313-5875 (electronic)
Publication Stock No. WPS220344-2
DOI: <http://dx.doi.org/10.22617/WPS220344-2>

The views expressed in this publication are those of the authors and do not necessarily reflect the views and policies of the Asian Development Bank (ADB) or its Board of Governors or the governments they represent.

ADB does not guarantee the accuracy of the data included in this publication and accepts no responsibility for any consequence of their use. The mention of specific companies or products of manufacturers does not imply that they are endorsed or recommended by ADB in preference to others of a similar nature that are not mentioned.

By making any designation of or reference to a particular territory or geographic area, or by using the term “country” in this document, ADB does not intend to make any judgments as to the legal or other status of any territory or area.

This work is available under the Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO) <https://creativecommons.org/licenses/by/3.0/igo/>. By using the content of this publication, you agree to be bound by the terms of this license. For attribution, translations, adaptations, and permissions, please read the provisions and terms of use at <https://www.adb.org/terms-use#openaccess>.

This CC license does not apply to non-ADB copyright materials in this publication. If the material is attributed to another source, please contact the copyright owner or publisher of that source for permission to reproduce it. ADB cannot be held liable for any claims that arise as a result of your use of the material.

Please contact pubsmarketing@adb.org if you have questions or comments with respect to content, or if you wish to obtain copyright permission for your intended use that does not fall within these terms, or for permission to use the ADB logo.

The ADB South Asia Working Paper Series is a forum for ongoing and recently completed research and policy studies undertaken in ADB or on its behalf. It is meant to enhance greater understanding of current important economic and development issues in South Asia, promote policy dialogue among stakeholders, and facilitate reforms and development management.

The ADB South Asia Working Paper Series is a quick-disseminating, informal publication whose titles could subsequently be revised for publication as articles in professional journals or chapters in books. The series is maintained by the South Asia Department. The series will be made available on the ADB website and on hard copy.

Corrigenda to ADB publications may be found at <http://www.adb.org/publications/corrigenda>.

Notes:

In this publication, “₹” refers to Indian rupees and “\$” refers to United States dollars.
The fiscal year of India runs from 1 April to 31 March.

CONTENTS

TABLES AND FIGURES	v
ACKNOWLEDGMENTS	vi
ABBREVIATIONS	vii
EXECUTIVE SUMMARY	viii
I. INTRODUCTION	1
A. Study Objectives	1
B. Evolution of the Hybrid Annuity Model as a Form of Public-Private Partnership in the Road Sector in India	2
C. Rebalancing Risk in the Hybrid Annuity Model	5
II. HYBRID ANNUITY MODEL CONTRACTS: CONCEPT AND FEATURES	7
A. Introduction to Hybrid Annuity Contracts	7
B. Overview of the Hybrid Annuity Model Process: From Project Procurement to Implementation	9
C. Ownership Structure of the Concessionaire	12
D. Salient Features of the Hybrid Annuity Model Contract	13
E. Features of the Hybrid Annuity Model Compared with Other Forms of Public-Private Partnership Contracts	24
F. Comparison of the Hybrid Annuity Model with National Highways Authority of India Engineering Procurement Construction Contracts	26
III. HYBRID ANNUITY MODEL CONTRACTS: EXPERIENCES	32
A. Introduction	32
B. Implementation of Projects in National Programs	33
C. Profiles of Companies Involved in Hybrid Annuity Model Projects	33
D. Hybrid Annuity Model Implementation in State Highway Programs	38
E. Experiences in the Water Sector	40
IV. LEARNINGS FROM EXPERIENCES	41
A. Introduction	41
B. Key Learnings from Implementation of the Hybrid Annuity Model	41
C. Identification of Drivers of the Hybrid Annuity Model	46
D. Assessing the Suitability of the Hybrid Annuity Model for Other Sectors and Countries	47
V. CONCLUSION AND RECOMMENDATIONS	49

APPENDIXES

1	Termination Clauses	52
2	Modifications in Technical and Financial Qualifications for Hybrid Annuity Model Bidders	55
3	Road Quality Scores, National Infrastructure Pipeline Road Plan (National Highways and Expressways)	56
4	Independent Engineer	58
5	Conditions Precedent for the Authority and the Concessionaire	59
6	Requirements to Deposit into and Withdraw from Escrow Account	60
7	Appropriation and Replenishment of Performance Security	61
8	Change of Scope Clauses	62
9	Steps to Calculate Costs of Reduced Scope	63
10	Payment Milestones during the Construction Period	64
11	Insurance Cover Requirements during the Operation Period	65
12	Force Majeure Events	66
13	Typical Hybrid Annuity Projects Completed by the National Highways Authority of India	67
14	Implementation in State Highway Programs	68

TABLES AND FIGURES

TABLES

1	Risk Sharing Arrangements between Government and the Private Sector in Various Contract Forms	6
2	Obligations of the Parties in Implementing Hybrid Annuity Model Contracts	11
3	Modifications to Technical and Financial Criteria in the National Highways Authority of India Hybrid Annuity Model	14
4	Typical Risk Matrix Associated with Achieving Financial Closure	36
5	Issues Faced in Land Acquisition and Clearances During the Construction Period	37
A1.1	Termination Provisions	52
A1.2	Termination Payment for Concessionaire Default (Construction Period)	53
A1.3	Termination Payment for Authority Default	53
A1.4	Definition of Debt Due	54
A2.1	Modification in Technical and Financial Requirements by the Ministry of Road Transport and Highways	55
A3.1	Breakdown of National Highways and Expressways (Length and CAPEX)	56
A3.2	Breakdown of Contribution by Center and States	56
A3.3	Vision 2025 for the Road Sector	57
A6.1	Requirements to Deposit into and Withdraw from an Escrow Account	60
A14.1	Status of ADB Hybrid Annuity Model Tranche 1 Projects in Rajasthan	68
A14.2	Status of ADB Hybrid Annuity Model Tranche 1 Projects in Madhya Pradesh	69

FIGURES

1	Revival of Private Sector Investment in India's Road Sector Post-Economic Downturn in 2009	3
2	Chronology of Hybrid Annuity Model Adoption in India	4
3	Schematic Depiction of Stakeholder Ecosystem in Hybrid Annuity Model Contracts	8
4	Typical Deal Diagram under the Hybrid Annuity Model	9
5	Sequence of Events during Contracts Using the Hybrid Annuity Model	10
6	Transaction Structure in Hybrid Annuity Model Sanitation Projects	28
7	Implementation of Hybrid Annuity Model Projects by the National Highways Authority of India	33
8	Bid Project Cost and Net Worth of Selected Companies	34
9	Market Share of Companies in Hybrid Annuity Model Road Space	34
10	Differences in State Bank of India Marginal Cost of Lending Rate and the Reserve Bank of India Bank Rate	37
11	Parameters to Be Considered While Assessing the Suitability of Countries	48
A3.1	Road Connectivity Score	56
A3.2	Quality of Road Infrastructure	57

ACKNOWLEDGMENTS

The authors would like to thank officials of the project executing and implementing agencies from the central and state governments of India; and representatives of construction companies and banks and financial institutions who participated in the interviews and provided valuable insights: Anup Arun Agarwal (Head, Debt Syndications, Axis Bank); B.K. Suresh Babu (Project Director, Karnataka State Highway Improvement Project); Madhava Kumar (Project Director, National Mission for Clean Ganga); Venkat Ram (General Manager, Finance, KNR Constructions Limited); Ritesh Sampath (Debt Syndications, HDFC Bank); Russel Shah (Senior Manager, L&T Finance Limited); and S. Vaikunthanathan (Vice President, Finance and Accounts, KNR Constructions Limited).

Drafts were reviewed by Ravi Peri (Director, South Asia Transport and Communication Division, South Asia Department); Michael Anyala (Senior Road Asset Management Specialist, Transport Sector Group, Sustainable Development and Climate Change Department); Chitoshi Izumi (Senior Procurement Specialist, Procurement Division 2, Procurement, Portfolio and Financial Management Department); and Anil Motwani (Senior Project Officer, Transport, India Resident Mission). While the reviewers' comments have greatly helped enhance the paper quality, it does not necessarily mean that the reviewers or the organization approve the contents of the paper.

ABBREVIATIONS

ADB	Asian Development Bank
BOT	build–operate–transfer
BPC	bid project cost
COD	commercial operation date
COVID-19	coronavirus disease
DB	design–build
DBO	design–build–operate
DBOT	design–build–operate–transfer
DRB	dispute resolution board
EPC	engineering, procurement, and construction
FIDIC	International Federation of Consulting Engineers
FY	fiscal (financial) year
HAM	Hybrid Annuity Model
IBRD	International Bank for Reconstruction and Development
km	kilometer
MCLR	marginal cost of lending rate
MORTH	Ministry of Road Transport and Highways
NHAI	National Highways Authority of India
NMCG	National Mission for Clean Ganga
NPV	net present value
PPP	public–private partnership
RBI	Reserve Bank of India
RFP	request for proposal
RFQ	request for quotation
SPV	special purpose vehicle
TOT	toll–operate–transfer

EXECUTIVE SUMMARY

Background: Since the introduction of the public–private partnership (PPP) model in procuring publicly funded projects in the road transport sector in India during 1996–1999, several variants of the model have evolved over the years. One of them is the Hybrid Annuity Model (HAM), which arguably takes a more balanced financing risk-sharing approach with the private sector, emphasizes high project readiness, provides early completion incentives, and responds to several other issues facing the construction industry. HAM has been successful in enhancing the bankability of road sector projects and attracting private sector interest. The Asian Development Bank (ADB) has been actively participating in financing HAM-based road projects in India. The HAM concept is also being extended to water sector project implementation. Given the huge demand from ADB developing member countries to invest in public infrastructure, the application of HAM is likely to continue and increase in the future. It is instructive to examine the salient features of HAM, implementation issues, and enhancement opportunities, and to identify requirements in applying this concept to other sectors and regions.

Objective: This study (i) seeks to examine basic features of HAM and how they compare with other contract models; (ii) explores current practices, opportunities, and challenges in using HAM in each phase of a project life cycle: procurement, development, construction, and operation and maintenance (O&M); (iii) highlights certain improvements that might be brought into the existing model to enhance its acceptability; and (iv) attempts to identify drivers of HAM and fundamental enabling elements necessary to extend the model to other sectors and regions.

Methodology: This study is based on primary as well as secondary research. The secondary research involved a study of the model features of HAM and a comparative analysis with other contract models that are in use in India, and analysis of data obtained from publicly accessible sources. Through primary assessment comprising consultations involving implementing agencies, lenders, and concessionaires—along with the secondary literature research on HAM—the study presents experiences and documentation issues faced by stakeholders involved in implementing HAM in road and water sector projects in India.

Findings

Innovative features

- (i) Innovative features that have led to the success of HAM include financial risk sharing between government and the private sector by injecting a portion of project costs during construction, accepting the risk of revenue forecast and collection, and hedging inflation by ensuring indexation of construction costs and O&M payments.
- (ii) The introduction of amenable qualification criteria has been instrumental in sustaining market appetite and broadening the supply base beyond large companies.
- (iii) Provisions requiring environmental permits and forest clearances—and at least 80% of site availability at commencement—are strong measures intended to achieve a high level of project readiness at the outset.
- (iv) By focusing on performance-based service specifications for end users, the model offers flexibility to the private sector to promote innovation in construction and O&M.

Applicability of the Hybrid Annuity Model in a country or sector

Potential areas of improvement and primary drivers of HAM have been identified where applicable in a country or sector.

Potential areas of improvement:

- (i) The HAM contract form layout has scope for improvement by providing layered structures comprising general conditions, project-specific conditions, and contract-specific data. This would ease preparation and referrals to project-related peculiarities within the contract structure.
- (ii) To enhance cash flow during construction, milestone payment frequency may be increased to monthly by linking the schedule of payment with the achievement of specific progress milestones. The provision of an interest-free mobilization advance during construction would reduce financial risk to the concessionaire, which would encourage more competitive bidding. Incentives need to be enhanced to incentivize for early completion.
- (iii) Adjusting the private sector financing proportion during construction based on project requirements and market dynamics would help increase the market size and appetite.
- (iv) Other areas of potential improvement include linking the termination payment with the value of the asset created, strengthening the escrow mechanism, and improving communication protocols to ensure the transparency of information among project stakeholders.
- (v) For efficient project administration and greater due diligence, roles and responsibilities of the independent engineer could be enhanced, including empowerment to make time-bound binding determinations on claims. To enhance process fairness and instill confidence in the private sector, provisions could be made requiring dispute resolution board members to come from pools maintained by reputed independent dispute resolution forums.
- (vi) To draw interest from a wider pool of developers and enhance confidence among the lending fraternity for advancing funds in HAM projects, it is essential to provide credit enhancement mechanisms of the authority.
- (vii) Despite the requirement to provide at least 80% of the site at the commencement of construction, land acquisition delay still constitutes a major cause of project completion delay, requiring heightened focus on project readiness at the outset.

Drivers of the Hybrid Annuity Model

- (i) The presence of PPP legal frameworks supporting sector-specific policies, tariff determination instruments, standard procurement documents, model concession agreements having equitable risk-reward allocation, payment frequency, and functional dispute resolution mechanisms are essential to instill confidence for private sector participation.
- (ii) Public institutions offering dedicated PPP procurement entities and personnel that are capable and committed in planning, procurement, and implementing HAM projects create a differentiator to attract private sector participation.
- (iii) The ability and credibility of the authority to make timely payments to the concessionaire is a key to attracting private sector financing.
- (iv) Good governance, accountability, the capability to make a prompt decision, transparent and fair PPP procurement processes, and effective stakeholder consultation are important elements for the successful implementation of HAM projects.

- (v) The existence of a robust ecosystem of stakeholders—including construction companies, implementing agencies, technical consultants, credit rating agencies, investors, and insurance companies—is a prerequisite for the takeoff and growth of HAM implementation.
- (vi) The presence of a stable secondary market consisting of “patient capital” investors—such as pension funds, infrastructure funds, and long-term investors—is essential for the feasibility and growth of HAM.
- (vii) Sectors such as roads and railways, water supply and sewage treatment, and energy generation and transmission—which provide the ground for design innovation and implementation efficiency—are likely to see the advent of HAM.
- (viii) Projects having an asset operational life longer than the concession period are likely to draw the attention of private investors.
- (ix) Projects need to be bankable to attract the private sector.
- (x) The level of project readiness in terms of availability of land and regulatory approvals is critical for success.

I. INTRODUCTION

A. Study Objectives

Several public–private partnership (PPP) models in the road transport sector in India have evolved since the introduction of PPPs during 1996–1999.

One model is the Hybrid Annuity Model (HAM), which arguably takes a balanced financial risk sharing approach without allocating demand risk to the private sector.¹ The model consists of contractual safeguards that emphasize high project readiness while also providing incentives for early completion.

Since HAM was approved in 2016 by the Government of India Ministry of Road Transport and Highways (MORTH), HAM implementation has been increasingly applied by central and state government agencies to attract private finance in procuring national highways and state road projects. HAM has also been adopted in Indian sanitation development projects.

The Asian Development Bank (ADB) has been financing HAM-based road projects in the Indian states of Karnataka, Madhya Pradesh, and Rajasthan. This trend is likely to continue, as the ADB Strategy 2030 strives to expand and broaden its private sector operations—which play an important role in mobilizing resources for development—to fill long-term financing needs for infrastructure in the region, and help drive innovation and efficiency in ADB developing member countries.²

This study seeks to examine the salient features of HAM, including current practices; lessons learned; and opportunities and challenges in implementing all phases of HAM-based projects (procurement, development, construction, and operation and maintenance [O&M]). It explores the fundamental requirements for an enabling environment, highlighting features that may add value in developing infrastructure projects in different sectors and countries. The methodology adopted for conducting the study included both primary and secondary research. The secondary research included the study of the model concession agreement of HAM and a comparative analysis with other contractual forms adopted in India. The primary assessment comprised consultations with implementing agencies, lenders, and concessionaires, and secondary literature research on HAM. The study presents experiences and documents issues faced by stakeholders involved in implementing HAM in road and water sector projects in India.

This paper is a continuation of the working paper *Hybrid Annuity Contracts for Road Projects in India*, which sought to identify the value generated in HAM by using the value-for-money analysis framework.³ To further the understanding and utility of HAM across other sectors and geographies, the paper also discusses certain improvements that might be brought to the model to increase its acceptability among stakeholders. The key takeaways include

- (i) Comparative analysis of HAM projects in India, assessment of its suitability, and comparative analysis with other modes of implementation.

¹ HAM requires part of the finance by the private sector during the construction phase, which will be paid during the O&M phase by the authority.

² ADB. 2018. *Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific*. Manila.

³ R. Peri, C. Chen, and D. Dey. 2019. *Hybrid Annuity Contracts for Road Projects in India*. ADB South Asia Working Paper Series. No. 68. Manila: Asian Development Bank.

- (ii) Lessons learned during project procurement, development, construction, and O&M phases.
- (iii) Defining a framework to determine the suitability of sectors and regions where it can be implemented.

B. Evolution of the Hybrid Annuity Model as a Form of Public–Private Partnership in the Road Sector in India

During 1996–1999, India introduced one of the largest PPP programs in the roads and highways sector, which has evolved significantly up to 2021. Figure 1 indicates the number of road sector PPP projects awarded in India from fiscal year (FY) 2005 to FY2020.⁴ PPPs are a form of long-term concessions and were modeled on the United Kingdom Project Finance Initiative.

To enable private sector participation in the highway sector, the National Highways Act, 1956 was amended in 1995. Modification of the act was necessary to empower the central government to enter into agreements with other partners for the development and maintenance of highways.⁵ An important enabler was the incorporation of the Infrastructure Development Finance Company in 1997. This firm was promoted by the Government of India based on the recommendations of the Expert Group on Commercialization of Infrastructure Projects.⁶ This allowed the private sector to participate in infrastructure development by utilizing its expertise, financial capital, and managerial skills. In addition to various sources of financing of projects by multilateral financing institutions, mechanisms such as viability gap funding, and the India Infrastructure Project Development Fund—under the Department of Economic Affairs—further paved the way for PPP projects in India.

Learning and development throughout the evolution of PPPs included formalization of concessional policy frameworks, experiential basis changes in the model concession agreements, increased willingness of users to pay for higher-quality services, and the enablement of an efficient ecosystem of project stakeholders, i.e., concessionaires, lenders, implementing agencies, consultants, and asset users. The highway sector in India started developing PPPs in 1996. Initially, state and central government agencies tried various combinations of PPP models such as toll-based build–operate–transfer (BOT-Toll) and annuity-based build–operate–transfer (BOT-Annuity). With lessons learned from initial projects, the government launched the National Highways Development Project for the four-laning of highways in 1999. Under the program, four-laning of 322 road projects were implemented comprising a total highway length of 13,000 kilometers (km). As the PPP model was not mature yet, only 22 projects were awarded as toll-based projects and 27 projects were annuity-based projects.⁷

The Government of India approved the PPP model concession agreements for highways in 2006. These model concession agreements were introduced for both annuity- and toll-based projects (both premium and viability gap funding). In addition, numerous institutional mechanisms such as standardized manuals for road specifications, formulation of PPP units, delivery of PPP training, guidelines for government offices to approve PPPs—as well as notifications for tariff charging—were formulated by the Planning Commission. These factors led to increased adoption and implementation of PPP road projects in India.

⁴ The World Bank. Infrastructure Finance, Public–Private Partnerships, and Guarantees.

⁵ Government of India. 1956. National Highways Act 1956.

⁶ B. Patel and S. Barghat. 2019. Significance of Public Private Partnerships in India. *International Research Journal of Engineering and Technology*. 6 (12). pp. 1523–1528.

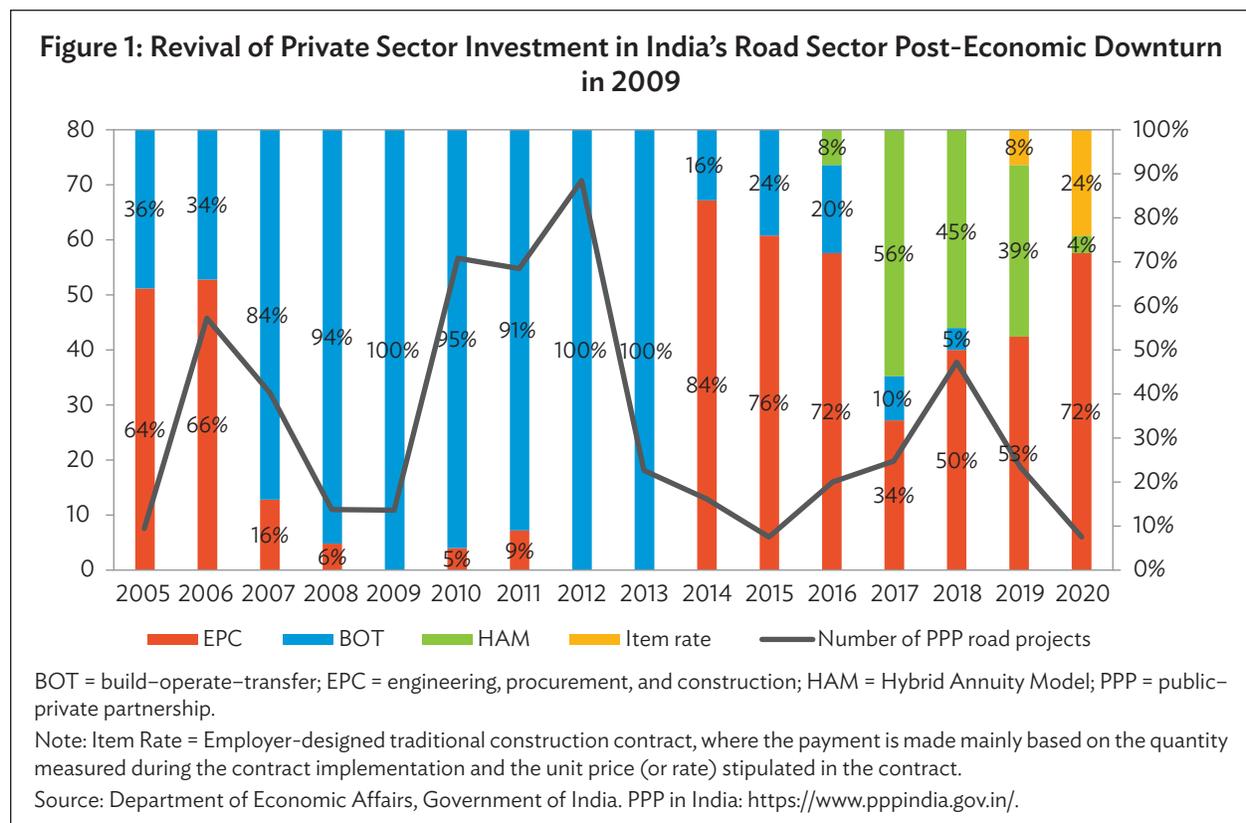
⁷ S. Garg and M. Dayal. 2019. Road Learnings: Evolution of Public Private Partnership in the Indian Highway Sector. *Science Direct*. 48, pp. 2488–2510.

The economic downturn in 2008-2009—coupled with issues such as fragile investor balance sheets, aggressive bidding, delays in land handover and approvals by authorities—manifested into larger execution issues.

The BK Chaturvedi Committee was formed in 2009, which provided the following recommendations:

- (i) modifications in the model project documents;
- (ii) empowering MORTH to make amendments in requests for proposals (RFPs) and requests for quotations (RFQs) based on recommendations from the National Highways Authority of India (NHAI); and
- (iii) prioritization in the mode of implementation of projects i.e., BOT-Toll followed by BOT-Annuity and engineering, procurement, and construction (EPC).

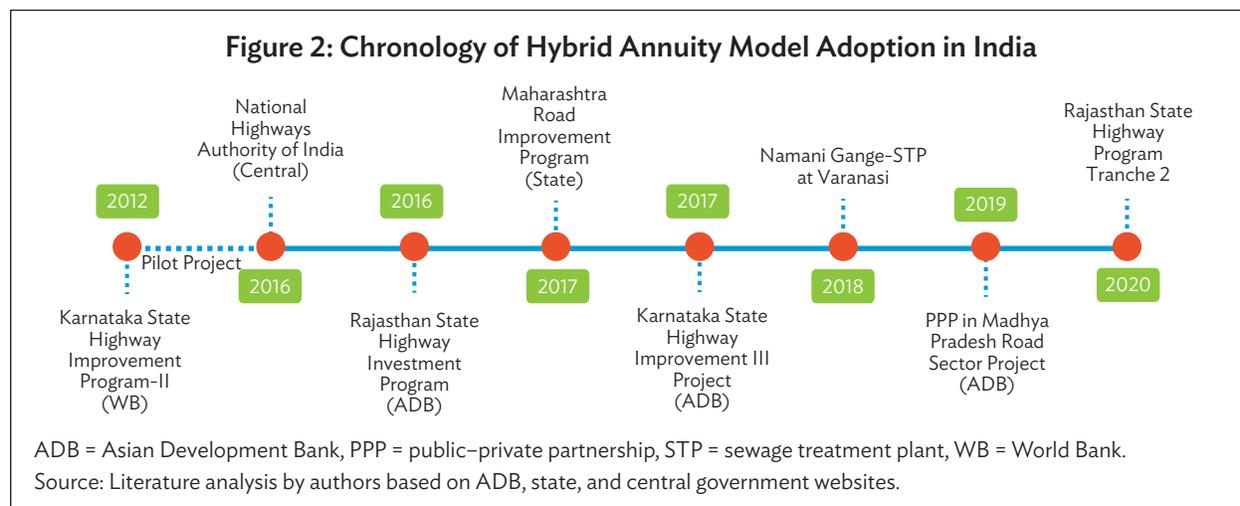
The implementation of changes as proposed in the BK Chaturvedi report led to the revival of private sector investment post the economic downturn in 2009 (Figure 1).



The number and types of PPP projects peaked in 2012 and declined from 2013 until HAM was introduced in 2016 (Figure 1). The reasons cited had already manifested into stalled projects and an increased number of nonperforming assets. To address these concerns, several changes were introduced into the concession agreements about site handover, signing of state support agreements, improvement of project supervision, allowing for change in ownership clauses, security provision to lenders, introduction of clauses for change in scope, compensations for variations in traffic growth, etc. However, the market appetite for BOT projects continued to fall. Projects under construction faced challenges in achieving completion on schedule and completed projects could not generate expected revenue. This led to further hesitation in private investment, and an unwillingness by lenders to fund the projects. Available

market liquidity had depleted due to the deterioration of many developers. To revive the interest of private developers, it was felt necessary to formulate an alternate and more balanced model incorporating features of both the EPC model and a long-term PPP model.⁸ This led to the introduction of HAM in 2016, whose concept was published in 2014 by the Government of India Planning Commission.⁹

Figure 2 shows the chronology of HAM adoption in India. HAM was piloted in the Karnataka State Highway Improvement Project (financed by the World Bank) in 2012. Subsequently, it was approved by MORTH in 2016 with some modifications, including the introduction of two bidding variables (net present value of bid project cost [BPC] and first-year annual operations cost) as compared to one variable (BPC) in the pilot project. NHA adopted HAM in developing national highways across India (Appendix 13). At the same time, ADB started enabling replication of HAM-based projects across various states. As of 2021, ADB is financing HAM projects through the Karnataka State Highways Improvement III project, the Rajasthan State Highway Investment Program (Tranches 1 and 2), and the Madhya Pradesh road sector project.



HAM linked the “construction payment” element of EPC contracts with long-term de-risked annuity payments. This model of contract reduced the financing burden on the private sector significantly when compared to other PPP models such as BOT-Toll and BOT-Annuity. With the advent of HAM and a high supply of projects, newer players emerged.

Within the first 3 years of HAM implementation, almost 50% of all national highway projects—by number—were procured under HAM (119 projects for a total length of 6,670 km).¹⁰ Owing to its risk-balanced approach, the model bears significant future potential and remains instrumental in an ambitious plan by the Government of India to channel investment of approximately \$1.4 trillion in infrastructure as part of the National Infrastructure Pipeline between FY2020 and FY2025.¹¹

⁸ V. Singh and M. Madurwar. 2019. *Hybrid Annuity Projects: Study of HAM in Highway Construction Projects*. Paper prepared for the Sustainable Infrastructure Development and Management conference. India. 22–23 February.

⁹ Government of India Planning Commission. 2014. *Public Private Partnership in Annuity Projects: Model Concession Agreement*. Delhi.

¹⁰ Crisil Research. 2019. *HAM paves ahead but cracks appear, too*.

¹¹ Government of India, Ministry of Finance Department of Economic Affairs. 2020. *National Infrastructure Pipeline Report of the Task Force (Volume I)*. Delhi.

HAM-based projects attracted significant attention from national companies at the bidding stage. It was observed that HAM projects attracted four to six bids per project on average. The average BPC was found to be at variance with NHAI estimated project costs. In about 40% of projects where smaller bidders had been awarded projects, the BPC was more than 10% lower than the NHAI estimated project cost, while the bid price in most projects by large companies was 10% higher than the estimated cost (footnote 10). While this indicated some aggression in bid pricing, such tendencies eventually reduced as the model matured.

One of the pitfalls of any annuity model—including HAM—is the increasing commitment and burden on future fiscal space, which also needs to be managed cautiously. This is possibly a reason why the number of projects launched and awarded under HAM declined from 2019 onward and there has been a shift toward the EPC model of implementation (Figure 1). Another issue was supply. A large number of market opportunities under HAM led to participation by a diversity of developers. While established developers found it relatively easy to achieve financial closure, small and medium-sized developers—who had switched from the EPC model to HAM—found it challenging to achieve financial closure. Delays in securing funding from banks and financial institutions led to delays in financial closure and appointed date declarations in various projects. The average delay in the appointed date declarations was 5–6 months. On the other hand, large companies had multiple orders and started facing capacity constraints in bidding for new HAM projects. The situation worsened due to limited financial capacity, as well as economic uncertainty due to the coronavirus disease (COVID-19) pandemic.

The HAM approach was also adopted in 2018 by the water treatment sector in the National Mission for Clean Ganga program. HAM is being implemented for sewage treatment plants at Haridwar and Varanasi. The project structure has borrowed from the road sector model with both the annuity and operations payments tied to the performance of the asset over the entire operating period. At the same time, the contractual form considers various sector-specific risks including the maturity of PPP adoption in the sector, available competition, and technological complexity. This includes—among other things—modifications to the frequency of payments, relaxed RFP qualification criterion, payment of interest, and operational complexities.

C. Rebalancing Risk in the Hybrid Annuity Model

Fair and balanced risk–reward allocation under any contract is considered a fundamental requirement to increase the likelihood of achieving successful project outputs, minimize disputes, and keep the contract price moderate and optimum.¹² In allocating risks to a party to a contract, the Abrahamson principles—as redefined by Neil Bunnie—consider that a party that (i) can best control the risk and/or its associated consequences, (ii) can best foresee the risk, (iii) can bear that risk, and (iv) ultimately most benefits or suffers when the risk eventuates.

Risk-sharing arrangements vary depending on the contract model. Typical risk-sharing arrangements in publicly procured projects (Table 1) are PPP-based: (i) design–build–operate (DBO), (ii) design–build–operate–transfer (DBOT), (iii) design–build–operate–transfer annuity (DBOT–Annuity), and (iv) HAM. Road sector EPC contracts in India may also fall under the PPP model, such as when a contract requires O&M to be executed for a specific number of years after construction completion.

Construction, design–build (DB), and design–build–operate (DBO) contracts. In a conventional employer–designed construction contract—usually item rate–based—the contractor assumes the risk of construction. In DB contracts—usually lump sum–based—the contractor is also required to assume the design risk. Under a DBO contract, a contractor is required to take the additional risk of asset O&M

¹² International Federation of Consulting Engineers (FIDIC). 2019. *FIDIC Golden Principles*, para 5.3.

Table 1: Risk Sharing Arrangements between Government and the Private Sector in Various Contract Forms

Project Risk /Contract Model	Const.	DB	EPC	DBO	DBOT	DBOT-A	HAM
Design	G	P	P	P	P	P	P
Construction	P	P	P	P	P	P	P
Operations	G	G	G	P	P	P	P
Revenue Forecast	G	G	G	G	P	G	G
Revenue Collection	G	G	G	G	P	G	G
Finance	G	G	G	G	P	P	G+P

G Government **P** Private **G+P** Government + Private

Const. = construction; DB = design-build; DBO = design-build-operate; DBOT = design-build-operate-transfer; DBOT-A = design-build-operate-transfer annuity; EPC = engineering, procurement, and construction; HAM = Hybrid Annuity Model.

Source: Literature analysis by authors.

(where maintenance is linked to construction). Under these contracts, the private sector is not exposed to project financing risks.

EPC Contract: Although contractor risks are limited to design and construction in DB and EPC contracts, the EPC format typically requires it to take greater risks compared to item-rate contracts. For example, under the International Federation of Consulting Engineers (FIDIC) contract forms, the contractor is required to undertake the additional risks of errors, inaccuracies or omissions in requirements of the authority, risks of verifying the authority provided data, and risks of unforeseeable physical conditions. Such additional risks result in higher contract prices. EPC contracts for road projects in India frequently include obligations to maintain the road asset (in the case where maintenance of the asset is linked with its construction) for a specific number of years after construction is completed, which renders the contract to a variant of a DBO. Under EPC contracts, however, the contractor plays no role in traffic forecast, toll collection, or project financing.

Design-Build-Operate-Transfer (DBOT) Contract: DBOT is a traditional form of the PPP model, where all the primary risks fall on the private sector. In addition to design, construction, and O&M, the private contractor is required to take risks associated with revenue forecast, revenue leakage, and project financing. Road sector PPP projects in India—although referred to as BOT-Toll or BOT-Annuity models—typically require the concessionaire to take design risks as well, so that they may be viewed as DBOT or DBOT-Annuity models. For example, in some BOT-Toll or BOT-Annuity concession agreements, detailed project reports—along with detailed design—are provided for reference. The concessionaire may adopt and own the design or propose another design while adhering to the technical schedules within the given right-of-way. In most BOT-Toll or BOT-Annuity contracts, only typical cross-sections are provided. The concessionaire is then required to base its detailed design on what has been provided.

Design-Build-Operate-Transfer Toll (DBOT-Toll) Contract: The DBOT-Toll model transferred significant financial risks related to revenue forecast and collection to the private sector. Although initially well received by the private sector, this model had very few takers. Many private contractors were finding it difficult to recover their investments with a reasonable rate of return. Some of the issues faced with DBOT-Toll projects include project construction delays due to land acquisition issues and the realization of lower than anticipated toll revenues. Due to the distress faced in these PPP modes, financial institutions were also wary to fund these projects.

Design–Build–Operate–Transfer Annuity (DBOT-Annuity) Contract: The DBOT-Annuity model of PPP was primarily considered as a method to defer funding, preventing the transfer of substantive risks related to revenue forecast and collection to the private sector. The planning commission opined that “while concessions based on user charges led to mobilization of additional resources, annuity concessions imply deferred government payments akin to borrowings and do not lead to mobilization of additional resources.” It has been stated that annuity PPPs created explicit and implicit obligations on the part of the public entity that was party to such contracts, which eventually became contingent liabilities for the Government of India. The fiscal fallout for such contracts reflected on the balance sheet of the public sector and required additional budgetary support from the government.

DBOT-Annuity—which is a variant of the DBOT model—shifts back the risk of toll revenue forecast and collection from the private sector to the government, and the private sector is paid annuity during the operation and maintenance period. Under this model, annuity payment was fixed throughout the entire operations period, which exposed concessionaires to the risk of long-term inflation. This resulted in either making their bid uncompetitive or eroding equity returns.

Hybrid Annuity Model (HAM): HAM is a variation of the DBOT-Annuity model, incorporating a milestone-based payment mechanism during construction as found in EPC contracts, although this payment covers only the partial cost of construction. HAM—which may be viewed as a blend of the EPC and DBOT-Annuity models—rebalances the financial risks between government and the private sector. The public sector assumes the risks of revenue collection and forecast as in the annuity model, partially shares the financial risk by infusing a part of the project cost during the construction period, and hedges inflation by ensuring indexation of construction costs and O&M payments.

II. HYBRID ANNUITY MODEL CONTRACTS: CONCEPT AND FEATURES

A. Introduction to Hybrid Annuity Model Contracts

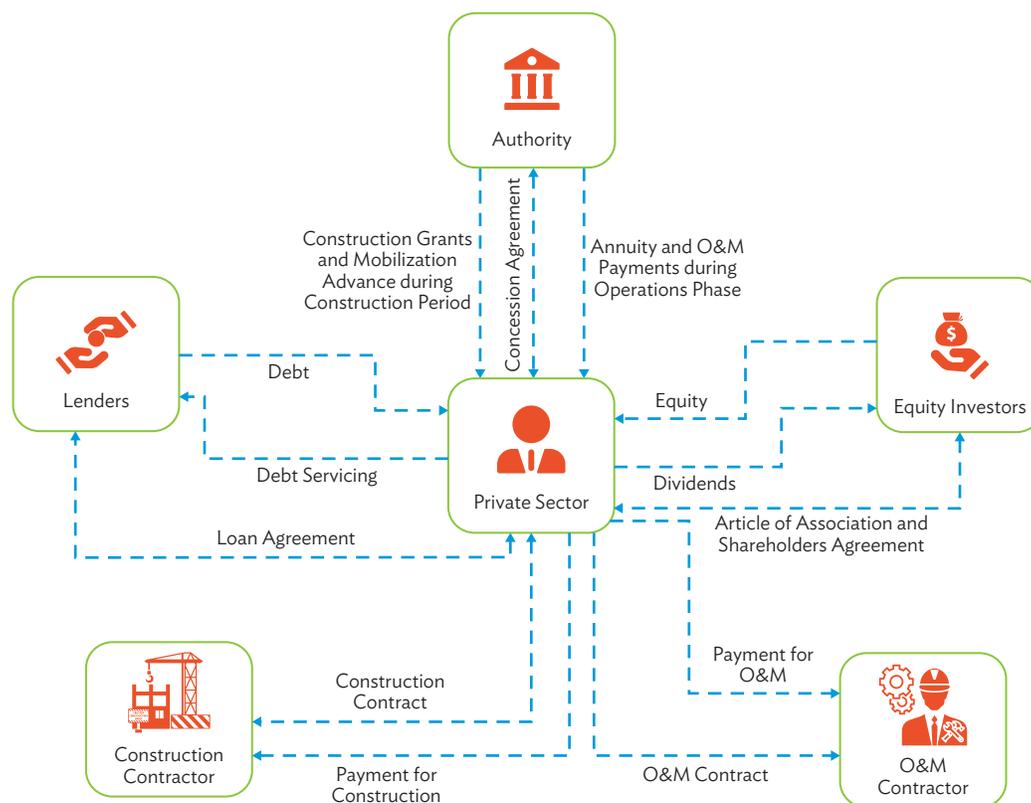
The Hybrid Annuity Model (HAM) requires that part of the private sector financing by the concessionaire during the construction phase be paid by the authority during the operation and maintenance (O&M) phase.

The stakeholder ecosystem in HAM contracts does not deviate from the conventional public–private partnership (PPP) structure (Figure 3).

HAM project cost is determined from open competitive bidding and is discovered on its life-cycle cost—in other words, on net present value (NPV)—for the construction as well as the O&M period. The term “cost” in this context is deemed to include both base cost and its associated overhead, and profit.

A bidder is required—in its bid—to quote the bid project cost (BPC) and the first year O&M cost. The bidding parameter for HAM projects is referred to as life-cycle costs which consider the NPV of the quoted BPC along with the NPV of O&M costs to be incurred for the entire operations period.¹³

¹³ Government of India, Ministry of Road Transport and Highways. 2016. *National Highways Authority of India circular on Hybrid Annuity Model for implementing highway projects*. Delhi.

Figure 3: Schematic Depiction of Stakeholder Ecosystem in Hybrid Annuity Model Contracts

O&M = operation and maintenance.

Source: Analysis by authors based on Ministry of Road Transport and Highways Circular: Hybrid Annuity Model for Implementing Highway Projects. Government of India (8 February 2016).

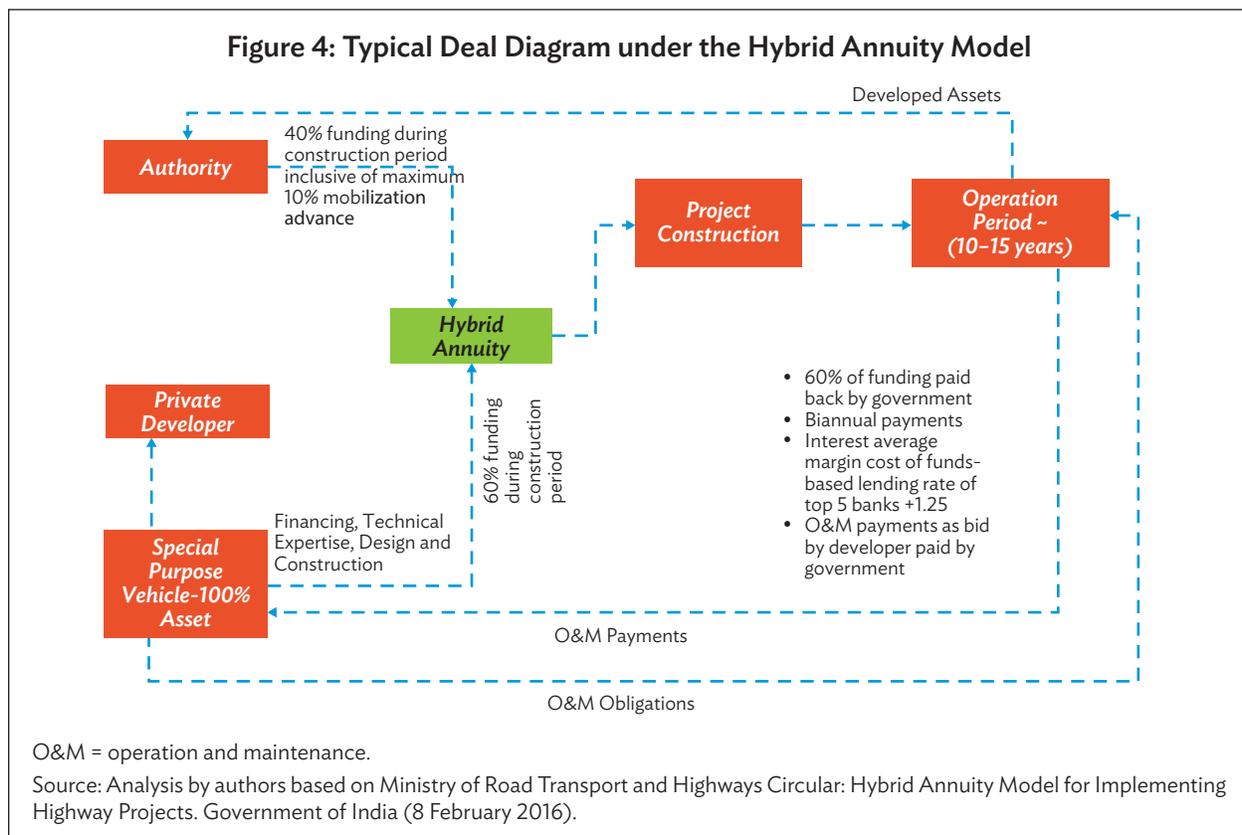
Project cost during construction is shared between the government and the private sector. The cost-sharing proportion is not fixed but varies depending on requirements and project feasibility. The approach initially endorsed required that the government invest 40% of the BPC during the project construction period (as construction assistance), in five equal installments, linked to the achievement of predefined construction milestones. The private investor was required to invest the remaining 60%, which typically comprises equity and debt. For illustration purposes only, in a construction project costing \$100 million (40% government, 60% private sector financing), the authority would be required to inject approximately \$40 million during construction, and assuming a 75:25 debt–equity ratio. The private sector would be required to invest \$45 million in debt and \$15 million in equity.

Upon completion of the project construction—during the O&M period—the government pays semiannual annuity amounts to the private investor for the 60% of the project cost that was financed by the private party during construction, along with interest on the reducing balance. The interest calculation period starts only after the commencement of operations. The project cost is adjustable to account for inflation, change in work scope, changes in law, and force majeure.

Additionally, payments for O&M are made during the operation period based on the quoted bid price for O&M, adjusted for inflation. These payments are subject to fulfillment of performance standards by the concessionaire as required by the relevant schedules of the concession agreement.

Considering that the O&M risk is borne by the concessionaire, payments made by the authority are linked to the inflation-adjusted bid variable and are independent of the actual O&M costs borne by the concessionaire.

The requirement of annuity and O&M payments during O&M necessitates the authority to ensure revenue sources. Typically, toll collection by the authority after the project commences commercial operation is considered as a basic source of revenue. The annuity payments may be aligned with the project revenue profile. Other sources for the payment may include budgetary allocation and market borrowings (Figure 4).



B. Overview of the Hybrid Annuity Model Process: From Project Procurement to Implementation

Procurement: HAM-based contracts in India follow the single-stage-two-envelope bidding procedure. The envelopes containing technical bids are evaluated first to ensure that bidders meet required qualifications—including technical and financial capacity requirements—before evaluation of the financial bids. In evaluating bidder qualifications—such as relevant experience in construction and maintenance—bidders are examined against the prespecified minimum net worth and financial resources requirements to partially fund the construction phase of the project.

Contract Agreement: Within 45 days after the letter of award is issued, the bidder is required to promote and incorporate the concessionaire as a limited liability company, establish a special purpose vehicle (SPV), and—under the concessionaire SPV name—sign the concession agreement with the authority. This will enable the concessionaire to undertake and perform the obligations and exercise the rights

of the winning bidder. Under this agreement, the authority awards the concessionaire the concession, including its exclusive right, license, and authority to construct, operate, and maintain the “project” during the concession period.

1. Concession Period

The concession agreement period comprises three distinct phases:

- (i) development period;
- (ii) construction period; and
- (iii) operation period.

Summation of construction and operation periods is called the concession period, which starts from the appointed date and ends on the transfer date, the date on which the rights and obligations of the concessionaire under the agreement expires either through the performance or termination, and all its rights and interests in the project passes to and vests in the authority.

Figure 5 outlines the sequence of main events and Table 2 summarizes the basic obligations of parties during the project cycle.

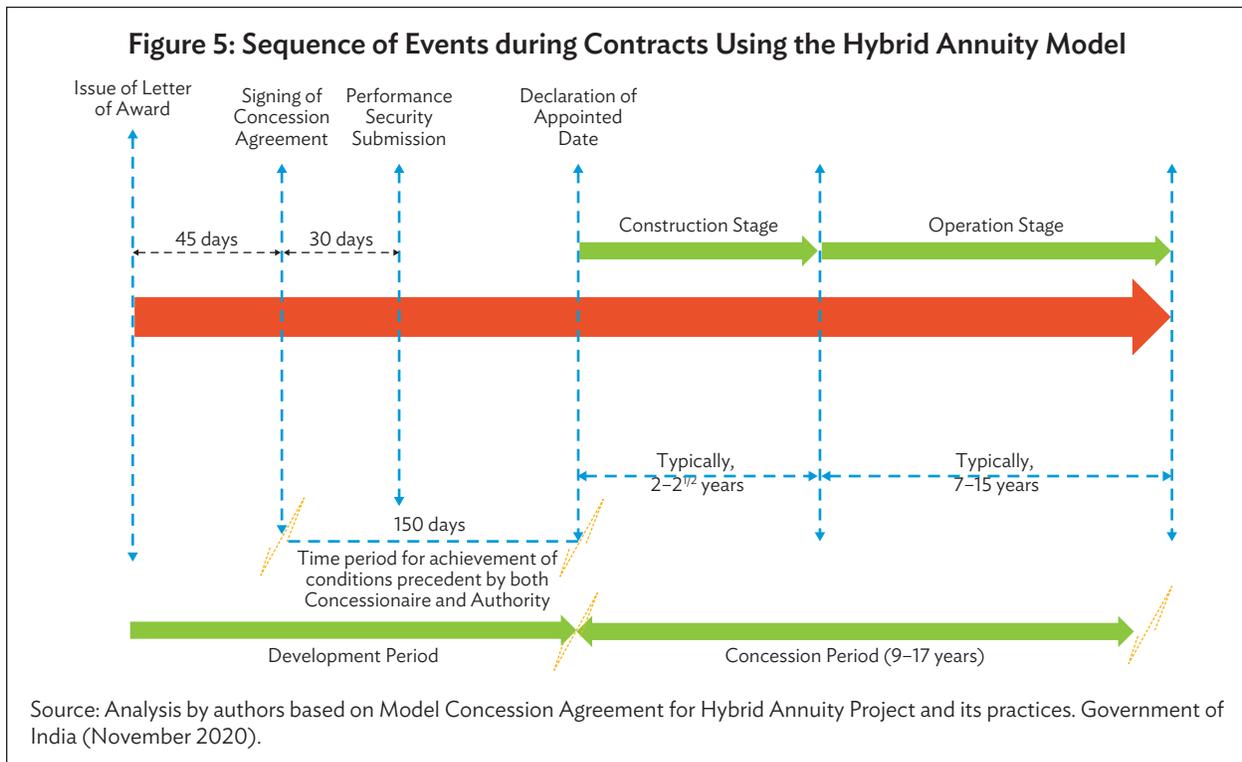


Table 2: Obligations of the Parties in Implementing Hybrid Annuity Model Contracts

Phase	Obligations of Concessionaire	Obligations of Authority
Development Period	<ul style="list-style-type: none"> • Submit performance security • Procure and execute escrow agreement and substitution agreement • Procure all applicable permits • Execute financing agreements 	<ul style="list-style-type: none"> • Procure right-of-way (site) for the project • Procure all applicable permits for environmental protection and forest clearance • Secure approvals for general arrangement drawings for road over-bridges or road under-bridges on the project, if any • Appoint independent engineer to administer the concession agreement
Concession Period	<ul style="list-style-type: none"> • Partly finance and construct as per specifications of concession agreement • Fulfill O&M obligations as per provisions of concession agreement 	<ul style="list-style-type: none"> • Pay to the concessionaire as per the achievement of construction milestones during construction period • Pay annuities, including interest on annuities, make O&M payments during operation period

O&M = operation and maintenance.

Source: Analysis by authors based on *Model Concession Agreement for Hybrid Annuity Project* and its practices. Government of India (November 2020).

2. Development Period

During phase 1 of the agreement (development period), both parties are required to satisfy their respective conditions precedent. The date on which all the conditions precedent—including financial close—are satisfied is called the “appointed date.”¹⁴ The development period spans from the concession agreement date to the appointed date. The specified period for this phase is usually 150 days from the concession agreement date.

Authority obligations within this period include securing (i) more than 80% of the site; (ii) 100% of environmental permits; (iii) 100% of forest clearance; and (iv) approval of general arrangement drawings for the road over- or under-bridges at level crossings, if any. The authority is also required to appoint an independent engineer to administer the concession agreement.

The successful bidder is required to establish an SPV and—under its name—(i) sign the concession agreement; (ii) submit performance security; (iii) make financing arrangements and achieve financial close; (iv) sign the escrow and substitution agreements; and (v) procure all applicable permits—including quarry permits—to meet at least 20% of the contract requirements.

The concessionaire is required to guarantee its share of finances during this phase. Financial close requires that the concessionaire ensure the initial availability of funds under the financing agreements.

Although works do not commence during the development period, the concessionaire is provided access to the site to perform preliminary works such as surveys, investigations, and soil tests. Upon inspection of the site and signing a memorandum containing an inventory of the site, the concessionaire is required to protect the project road from any occupations, encroachment, or encumbrances.

During this phase, the concessionaire is typically required to maintain—at its own cost—the road at the project site, ensuring it is in “pothole-free” condition and undertake repairs to maintain the quality and

¹⁴ As per the Government of India Ministry of Road Transport and Highways (MORTH) Article 42 of the *Model Concession Agreement for Hybrid Annuity Project*, (November 2020), “Appointed Date means the date on which financial close is achieved and every condition precedent is satisfied, in accordance with the provisions of the agreement, and such date shall be the date of commencement of the concession period.”

safety of the road in case of any material deterioration or damage.¹⁵ If excessive deterioration or damage is caused due to unforeseen events—such as floods or torrential rain—the authority is required to repair the road at its own cost.

3. Construction Period

The construction period does not commence unless both parties to the concession agreement fully satisfy their respective conditions precedent. The concessionaire is entitled to commence the work under the agreement on the “appointed date,” which is broadly similar to the “commencement date” under FIDIC contract forms.

During this period—other than undertaking the (design and) construction work—the concessionaire is required to partly finance the works as stipulated in the agreement.

The construction period commences on the appointed date and ends on the issuance of the completion certificate” or “provisional certificate” by the contract administrating consulting firm—independent engineer—marking the completion of the construction period, which is typically specified as 2 to 2.5 years.

4. Operation Period

Phase 3 of the agreement starts on the date on which the completion certificate—or the provisional certificate—is issued to the concessionaire. This date—on which the commercial service under the contract commences—is called the commercial operation date (COD).

During the operation period, the concessionaire is obliged to operate and maintain the asset under the agreement and is entitled to receive (i) O&M costs and (ii) annuity payments from the authority, following the agreement terms.

The operation period means the O&M period—which is stipulated as a fixed number of years—commencing from commercial operation date and/or provisional commercial operation date and ending on the transfer date.

In practice, the operation period typically varies from 7 to 15 years. State government-invested projects tend to opt for shorter periods, while central government-invested projects typically go for 15 years.

C. Ownership Structure of the Concessionaire

Until the completion of the construction period and 6 months thereafter (in the HAM 2016 version, the required period was construction period plus 2 years),

- (i) the winning bidder—including its joint venture members as applicable, together with its and/or their associates—is required to hold at least 51% of the concessionaire’s issued and paid-up equity on the date of the concession agreement; and
- (ii) in case the bidder is a joint venture, each joint venture member whose technical and financial capacity were considered in the bid evaluation is required to hold at least 26% of the equity.

¹⁵ As per the Government of India Ministry of Road Transport and Highways (MORTH) clause 6.2.1 of the *Model Concession Agreement for Hybrid Annuity Project* (November 2020), “Maintenance obligations prior to Appointed Date.”

In this context, the figure 26% holds specific significance because—under the Government of India Company Act 2013—consent of at least 75% equity holders is required on certain important matters.

Except with the prior written consent of the authority, the concessionaire is not allowed to undertake or permit any change in ownership, comprising—in aggregate—25% or more of the concessionaire total equity, or that leads to the acquisition of the direct or indirect control of the concessionaire board of directors. On a request for such consent, authority consideration would be based mainly on two factors: national security and public interest perspective. The authority may also require senior lender's "no objection" on the matter.

D. Salient Features of the Hybrid Annuity Model Contract

The fundamental concept of HAM was published in 2014 by the Planning Commission.¹⁶ MORTH—since issuing its first approved HAM contract in 2016—has continued to improve its contractual provisions to keep the document responsive to the needs of the stakeholders of the system.¹⁷ Details on change in ownership of the concessionaire, financial closure, payment of construction assistance, interest payment, mobilization advance, termination payment, dispute resolution, etc., changed in November 2020.¹⁸

HAM clauses on ownership structure, conditions precedent, escrow arrangements, substitution agreements, insurance, etc., are broadly similar to those in previous versions of BOT-Toll and BOT-Annuity contracts. But there are variations on payments, partial funding by the authority during construction, roles and responsibilities of the independent engineer, descoping of works, and termination payments, which make the structure unique. These variations are:

- (i) Mobilization advance. The HAM contract provides for interest bearing advance payment to the concessionaire for a sum equal to 10% of the bid project cost (BPC). The mobilization advance is paid to the concessionaire in two equal installments. The mobilization advance and interest is recovered from the concessionaire during the milestone payments.
- (ii) Partial funding by the authority during construction. Unlike under other PPP models such as BOT-Toll and BOT-Annuity, a pre-specified proportion of construction payments based on achievement of physical progress is made to the concessionaire in 10 equal installments, which are indexed to inflation.
- (iii) Descoping of works. The authority can descope part of the project in the case of non-acquisition of a portion of right-of-way. The BPC would be adjusted to reflect the changes.
- (iv) Termination payments. Unlike earlier PPP models, the HAM contract mandates termination payments if the project is terminated during the construction period due to concessionaire default. Other PPP models do not provide provisions for termination payments if the project is terminated during the construction period through concessionaire default. Details of termination payments under HAM are outlined in Appendix 1.

Partial funding arrangement by the government during construction. During the construction period, the authority (NHAI) is usually required to inject 40% of the BPC (the percentage may vary), adjusted for inflation and any change of scope. Although no contingency fund is allocated in the concession

¹⁶ Government of India, Planning Commission. 2014. *Public Private Partnership in Annuity Projects: Model Concession Agreement*. Delhi.

¹⁷ Government of India, MORTH. 2016. *Public Private Partnership in Highway Development, Model Concession Agreement for Hybrid Annuity Project*. Delhi.

¹⁸ Government of India, MORTH. 2020. *Changes in the Model Concession Agreement (MCA) for NHs works under Hybrid Annuity Mode (HAM) Projects*. Delhi.

agreement for any change of scope, the authority is required to arrange additional funds for price adjustments or other events. This arrangement

- (i) reduces the required amount of debt and equity to be arranged by concessionaire,
- (ii) decreases the requirement of funds tied up at financial closure (both debt and equity) as lenders derive comfort from the partial infusion of authority funds, and
- (iii) reduces the requirement of equity thereby lowering financial pressure on the concessionaire.

Elimination of traffic forecast and revenue collection risks and de-risking of revenue streams.

The authority assumes the full risks associated with traffic forecast and revenue leakage, which reduces risk exposure for the concessionaire. Following contract provisions, the concessionaire is paid its invested amount (typically 60% of the BPC) during the annuity period which gives it a guaranteed source of revenue. This payment is made semiannually during the O&M period on completion of construction.

HAM bid evaluation and qualification criteria. Table 3 indicates changes to key technical and financial criteria for HAM project bidder qualifications. Details of criteria modifications are provided in Appendix 2.

Table 3: Modifications to Technical and Financial Criteria in the National Highways Authority of India Hybrid Annuity Model

Original Criteria	Modified Criteria
<p>Financial: The bidder shall have a minimum net worth of 25% of EPC at the close of the preceding fiscal year.</p> <p>The bidder shall have financial resources as a capital cost of more than 10% of the specified estimated project cost.</p>	<p>Financial: The bidder shall have a minimum net worth of 15% of EPC at the close of the preceding fiscal year.</p> <p>The bidder shall have financial resources as a capital cost of more than 5% of the specified estimated project cost.</p>
<p>Technical: The bidder is required to have relevant experience in construction as well as maintenance. Construction experience includes relevant core sector experience including civil construction of power sector, commercial setups, airports, industrial parks or estates, logistics parks, pipelines, irrigation, and water supply.</p>	<p>Technical: The bidder is required to have relevant experience in construction as well as maintenance. Construction experience includes relevant core sector experience including civil construction of power sector, commercial setups, airports, industrial estates, logistics parks, pipelines, irrigation, water supply, stadiums, hospitals, hotels, smart cities, warehouses, silos, oil and gas, and real estate development.</p>
<p>EPC = engineering, procurement, and construction, RFP = request for proposal, RFQ = request for quotation.</p> <p>Source: Model RFQ-cum-RFP issued by Planning Commission in April 2014 (Government of India Planning Commission. 2014. <i>Public-Private Partnership Request For Qualification Model</i>. Delhi).</p>	<p>EPC = engineering, procurement, and construction.</p> <p>Source: Ministry of Road Transport and Highways (MORTH) circular dated 15 October 2020 (Government of India Ministry of Road Transport and Highways. 2020. As per MORTH Circular MORTH OM No. NH-35014/25/2017-H (pt. II). Delhi).</p>

Interest payment on construction costs during the O&M period. Annuity payments are subject to simple interest on the reducing balance of construction costs calculated from the COD. Interest during construction on the concessionaire share of financing is deemed to be included in the BPC.

Mitigation of inflation risk during construction and the O&M period. The authority assumes the inflation risk during the construction and O&M periods. Payments made during these periods are indexed with a mixture of the wholesale and consumer price indices. This helps the concessionaire cushion against changes in input prices during the construction and O&M phases.

Multiple bid parameters. DBOT-Toll and DBOT-Annuity contracts previously employed a single bid parameter permitting bidders to quote either the amount of viability gap funding or premium, or the semiannual annuity. The bid amount would remain fixed (for the annuity and grant portion) or would increase by a fixed percentage every year (for the premium). HAM has provided more flexibility by permitting quotes for two components as the bidding parameters: (i) BPC; the cost of construction of the project, which would be subject to adjustment for inflation, and (ii) O&M cost for the first year, which would be subject to adjustment for inflation every year.¹⁹ The MORTH HAM contract differs in its bidding variable compared to other PPP formats and prescribes the minimum net present value of two bidding variables:

- (i) BPC; and
- (ii) O&M costs for the entire operation period.

The bidder quoting the lowest value for a combination of these two bidding variables is awarded the project. However, variations in applying several bid parameters do exist in practice. For example, HAM followed in the implementation of state road projects in Karnataka, Madhya Pradesh, and Rajasthan has a single bid variable where bidders quoted the BPC only, and the O&M cost is computed as a percentage amount of the BPC.

Improvement of HAM. The introduction of HAM in 2016 led to an overwhelming response from developers. Nearly 50% of the PPP projects awarded by NHAI during 2017-2019 used HAM. However, during project implementation, certain factors were found to adversely affect the performance of several concessionaires. HAM has since been amended further to improve some of its original provisions:

- (i) **Increased time for divestment of equity stake.** HAM PPP contracts approved in 2016 allowed for a change in ownership of SPVs 2 years after the project commenced operations. In November 2020, MORTH reduced the period for change in ownership to 6 months post commencement of operations. This reflected the preference of the construction industry for reduced timelines for early recycling of equity locked into projects and is considered to be relatively low risk to the authority. The National Infrastructure Pipeline prescribes investment of approximately \$290 billion into roads during 2020-2025 (Appendix 3). With such huge demand, it is necessary that the supply of construction expertise is not constrained and that recycling of invested equity of construction companies is done. As a result of the reduction in the mandatory ownership holding period, concessionaires will be able to exit projects and recycle equity for other potential opportunities. BOT-Toll and BOT-Annuity projects awarded previously have already crossed the threshold of 2 years of ownership and are available for secondary market transactions. The modification in the clause on ownership in HAM projects (reducing the holding period from 2 years to 6 months post commercial operation date) was done to enable the transaction of HAM assets in the secondary market. In FY2021, there were various HAM acquisition deals announced, one of which saw a prominent road platform investor acquisition of HAM assets from two road construction companies. The Cabinet Committee on Economic Affairs authorized monetization of national highways through the toll-operate-transfer (TOT) model, under which an operational road asset is put up for bidding. The concessionaire has the right to collect a fee assigned for a predetermined period against an upfront payment of a lump-sum amount. The TOT concessionaire is also responsible for undertaking the O&M activities of the project. Foreign investors have shown considerable interest in bidding for the TOT bundles. The Macquarie Group was awarded the first TOT 681 km of national highways

¹⁹ Footnote 16, para. 59.

assets for \$1.4 billion for a concession period of 30 years.²⁰ Cube Highways won the third bundle of TOT and acquired toll and annuity assets from a variety of investors in India.²¹ The secondary market has received considerable attention from various pension funds, private equity players, infrastructure funds, sovereign wealth funds, and foreign EPC investors in PPP-based road assets in India.

- (i) **Increase in milestone payment frequency.** The original HAM contains provision for progress payments of the government financing portion in five installments during the construction period (typically 24 months), subject to fulfillment of physical milestones prescribed in the contract. These milestones would usually be achieved every 6 months and the concessionaires would receive payment post milestone achievement. Developers resorted to working capital facilities to manage cash flow mismatch. However, bankers were wary of extending working capital assistance to developers—who found it difficult to finance the gap—resulting in project delays. To address the issue, the total number of construction milestones was increased from five to 10 installments. The increased frequency has reduced the requirement of working capital thereby reducing financial stress on the concessionaires.
- (ii) **Interest payment pegged to the Reserve Bank of India (RBI) bank rate.** In the original HAM contract, concessionaires were required to repay the mobilization advance along with interest, which was pegged to the bank rate as declared by the RBI. The bank rate is essentially the overnight rate that RBI would charge for lending to other banks as part of its monetary policy. The 2020–2021 economic downturn and COVID-19 pandemic have caused RBI to reduce the bank rate so that more liquidity is infused into consumer markets. However, banks and finance institutions have been slow in transmitting the decrease in rate to consumers. As a result, even though the cash in-flows (for mobilization advance or the interest income) were indexed to the decreased bank rate, the debt service obligations of the concessionaire were indexed to individual bank base rates which were not entirely elastic to changes in the RBI bank rate. Several project developers requested that MORTH change the reference rate. HAM provision was then amended to change interest payments and mobilization advances from the bank rate to an average of marginal cost of lending rate (MCLR) of five principal banks and a premium of 125 basis points. Most bank MCLRs are similar and elastic to each other compared to the bank rate. This is expected to help in hedging the interest rate risk as both components are indexed to a similar benchmark. Proper risk allocation by modifying the index for computation to the authority is expected to enable better concessionaire performance.
- (iii) **Requirement of performance security increases in case of negative deviation.** In BOT-Toll and BOT-Annuity projects, the concession agreement linked performance security to the total project cost. In both cases, the bid variable was linked to concessionaire compensation. In HAM, the BPC quoted by the bidder formed the basis for compensation and is a proxy of construction costs to be incurred by the concessionaire. The BPC due and payable by the authority—as defined in the concession agreement of HAM contracts—is the cost of construction of the project as of the bid date. The BPC is inclusive of the cost of construction, working capital, physical contingencies, and all other costs, expenses, and charges for and with respect to the construction of the project. These costs do not include additional costs arising due to variations in the price index, change of scope, change in law, force majeure, or breach of agreement. The total project cost as defined in the HAM concession agreement is a subset

²⁰ Government of India, Press Information Bureau. 2018. *4th Roadshow by NHAI Inviting Investors for the Second Bundle of Toll-Operate-Transfer Project*. Delhi.

²¹ Government of India, Press Information Bureau. 2020. *NHAI Receives Upfront Consideration of Rs5,011 crores towards TOT Bundle 3*. Delhi.

of the BPC. In case of deviation from the limit as prescribed in the concession agreement, the HAM concession agreement requires additional performance security to be provided by the concessionaire.

- (iv) **Limits in costs to be incurred by the bidder (as per the financial agreement) to reduce speculation.** In BOT-Annuity and BOT-Toll projects, the concessionaire can achieve financial closure at its estimated project cost (after obtaining sanction from the lender) different from the authority estimated project cost, or the project cost quoted by the bidder. The estimated project cost is the cost estimated by the authority for the development of the project and outlined in the RFP for the bidders. The BPC is the cost of construction of the project as of the bid date, which is due and payable by the authority. The BPC is inclusive of the cost of construction, working capital, physical contingencies, and all other costs, expenses, and charges for and with respect to construction of the project. These costs do not include additional costs arising due to variation in the price index, change of scope, change in law, force majeure, or breach of agreement. The interplay between the BPC and first-year O&M costs allowed the bidder to front-load the O&M costs in the BPC itself. The compensation for the O&M costs—which ideally should have been received in the operations period—was being paid during the construction period.
- (v) Although the HAM concession agreement prescribes that performance standards need to be met by the concessionaire, lower O&M payments disincentivize the concessionaire from discharging its obligations during the O&M period. MORTH modified the clause whereby the amount finalized for financial closure—the cost estimated by the concessionaire for project completion—cannot be lower than the total project cost or is 10% less than the difference between the project cost estimated by the authority and 40% of the BPC. This essentially puts a “collar” around the financial closure contract price.
- (vi) **Termination payments.** Contract terminations of HAM projects occur due to a) force majeure, b) concessionaire event of default, or c) authority default. Unlike other BOT models, HAM provides termination payment to the concessionaire—even if the concessionaire defaults—for breaches occurring before the commercial operation date. This protects the interests of the concessionaire and lenders and improves the bankability of projects. For other PPP models, termination payments are indexed to project debt and equity infused by the concessionaire as per the provisions of the concession agreement. Since progress payment installments during the construction period have been increased from five to 10, changes have also been made in the payment structure to account for construction progress achievement (Appendix 1).
- (vii) **Introduction of a dispute resolution board capable of making binding decisions.** In earlier versions of HAM, mediation by the independent engineer followed by amicable settlement through conciliation—which was not binding—did not always yield optimal results, and most of the cases were referred to the lengthy arbitral procedure for resolution. To reduce the time required for decision-making, the concession agreement was modified requiring the formation of a dispute resolution board (DRB), whose decision would be binding for all parties. The board is required to give its decision within 56 days after receipt of all pleadings unless otherwise mutually extended by the parties. In the three-member board, each party selects one member, while the third member—who will chair the board—will be selected by the two members. The formation of an empowered DRB is expected to promptly resolve construction disputes and ease considerable pressure on the arbitration tribunal.

5. *Independent Engineer*

Within 60 days from the date of the concession agreement, the authority is required to appoint a consulting engineering firm—called the independent engineer—to administer the agreement. An initial appointment period would typically be for 6 months beyond the construction period, on expiry or termination of which each subsequent appointment would be made (typically 3 years).

The service fees of the independent engineer are shared equally by the authority and the concessionaire. This compares with FIDIC contract forms, under which the authority pays the total fees of the engineer.

While the authority has the discretion to terminate the appointment of the independent engineer at any time, the concessionaire may seek the termination on grounds that the engineer did not discharge its duties in a fair, efficient, and diligent manner.

The provisions on avoiding conflict of interest, fee sharing, and the possibility to seek termination of the independent engineer enhance the fairness principle and partnership approach.

The independent engineer is required to (Appendix 4):

- (i) **Act as impartial assessor.** Making assessments and fair determinations on cost adjustments, time extension requirements, and rectification of delays; mediating and assisting parties in arriving at an amicable settlement in cases of dispute between the authority and the concessionaire; and providing reasoned clarification in case of disagreement between the parties on the meaning, scope, and nature of good industrial practice.
- (ii) **Act as the authority's contract administrator.** Assisting the authority to administer the project throughout the project.

6. *Conditions Precedent*

To complete phase 1 and achieve the appointed date, each party to the agreement is required to fulfill the conditions precedent within the specified period of 150 days from the agreement date. The condition precedents to be satisfied by both parties to the agreement are outlined in Appendix 5.

The requirements to secure environmental permits, forest clearances, and at least 80% of the site at commencement are strong measures intended to achieve a high level of project readiness at the outset. The remaining site is to be handed over within 90 days of the appointed date (during the construction period). This compares with FIDIC contract forms, which do not prescribe any minimum threshold for providing access to and possession of the site, or for permits and clearances.

Although the authority is required to warrant that it has financial standing and the capacity to perform its obligations under the agreement, there is no requirement to deliver reasonable evidence of the financial arrangements of the authority to the concessionaire. This is a precedent condition to commence works under Sub-Clause 8.1 in FIDIC MDB 2010²², or a requirement to be provided under the financial memorandum within authority requirements (Sub-Clause 2.4 FIDIC Gold 2008²³), or under the contract

²² FIDIC. 2010. Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer, Multilateral Development Bank Harmonised Edition June 2010. Geneva.

²³ FIDIC. 2008. Conditions of Contract for Design, Build and Operate Projects (1st Ed, 2008). Geneva.

data (Sub-Clause 2.4 of FIDIC Red 2017²⁴/Yellow 2017²⁵). In the absence of any requirement to provide reasonable evidence of financial arrangements of the authority, projects led by agencies with a prompt payment track record—such as NHAI—and externally funded projects are likely to attract wider market interest and bidders are likely to reflect it in their bid prices accordingly.

The concessionaire is required to fulfill its obligations under the financing agreements at its own cost and expense. Prior written consent from the authority is required for any addition, revision, or replacement to the financing agreements, particularly if such modification is likely to have the effect of imposing or increasing any financial liability or obligation on the authority. The authority is required to give its consent for restructuring or rescheduling of the debt within 30 days of receipt of the request by the concessionaire.

Financial close requires the concessionaire to fulfill all conditions precedent to the initial availability of funds under the financing agreements. Financial close signifies the achievement of fulfilling all conditions precedent in securing the initial availability of funds. Once financial close is achieved, the concessionaire is required to promptly notify the authority, including prescribed supporting documents.

Remedy for delay or failure to achieve conditions precedent by the authority. If the authority delays achieving the conditions precedent within the specified period of 150 days, it would not be liable to pay any damages for the first 90 days of such delays. Thereafter—provided that the delay has not occurred due to concessionaire breach of the agreement or force majeure—the authority would be liable to pay to the concessionaire damages at the rate of 0.2% of the performance security amount for each day of delay, until satisfying such conditions precedent, and subject to the maximum limit equal to the bid security amount. After the damages amount reaches the bid security amount, the concessionaire would be entitled to terminate the agreement at its discretion, but without contractual entitlement for any other remedies.

Remedy for delay or failure to achieve conditions precedent by the concessionaire. If the concessionaire fails to achieve any of its obligations under the conditions precedent—unless the delay is attributable to the authority breaching the agreement or a force majeure event—the concessionaire would be liable to pay damages at the rate of 0.3% of the performance security amount for each day of delay, until satisfying such conditions precedent, and subject to the maximum limit equal to the bid security amount. After the damages amount reaches the bid security amount, the authority would be entitled to terminate the agreement at its discretion, but without contractual entitlement for any other remedies.

7. Escrow Agreement and Escrow Account

As a condition precedent within the development period—before the appointed date—the concessionaire is required to execute an escrow agreement—in a prescribed form—between the concessionaire, the authority, senior lenders, and a bank. In compliance with the agreement, the concessionaire must also open and establish an escrow account with the bank (escrow bank). Under the escrow agreement, the escrow bank acts as trustee for the authority, concessionaire, and the senior lenders, authorizing the bank to exercise the delegated rights, powers, authorities, and discretions.

²⁴ FIDIC. 2017. Conditions of Contract for Construction (Second Ed. 2017) for Building and Engineering Works designed by the Employer. Geneva.

²⁵ FIDIC. 2017. Conditions of Contract for Plant & Design-Build (Second Ed, 2017) for Electrical & Mechanical Plant & for Building & Engineering Works Designed by the Contractor. Geneva.

Requirements regarding deposits into the escrow account and withdrawals from the escrow account by the concessionaire during the concession period and after termination are indicated in Appendix 6.

8. *Substitution Agreement*

As a condition precedent within the development period, the concessionaire is required to execute and cause execution of a substitution agreement in a prescribed form between the authority, the concessionaire, and senior lenders who have agreed to finance the project under the concession agreement. Under this instrument, if the concessionaire defaults under either the finance or concession agreement, senior lenders are entitled to substitute the concessionaire with their nominated company to secure their interest in the concession.²⁶ Unless otherwise waived by the authority, the nominated company will be required to satisfy the qualification criteria that had been applied in qualifying the concessionaire. Senior lenders may select the nominated company through private negotiations, public auctions, or bidding. The substitution is usually undertaken and completed within 6 to 9 months of the default.

In procuring contracts in connection with, arising out of, or incidental to, the project, the concessionaire is required to include contract provisions entitling the authority or senior lenders—in their sole discretion—to step into such contract, in substitution of the concessionaire, in the event of the termination or suspension of the concession agreement. The contracts requiring such provision include the financing agreement, the EPC contract, and the O&M contract, but exclude small-value procurements, escrow agreements, and substitution agreements. If both the authority and senior lenders decide to exercise their rights, the authority would have priority over senior lenders.

9. *Performance Security*

Within 30 days of signing the concession agreement—while the bid security is still in force and effect—the concessionaire is required to provide an irrevocable and unconditional performance guarantee from a bank in a prescribed form. The guarantee amount is typically 5% of the BPC, which is an amount bid by the winning bidder and stipulated as such in the agreement. The concessionaire is also required to submit additional performance security in case its bid amount is lower by more than 10% of the estimated project cost.

The concessionaire has 75 days (45 days from the letter of award issuance to the date of agreement, plus 30 days from signing the agreement) to submit the performance security from the letter of award. This is comparable to the requirement to submit a performance guarantee within 28 days after receiving the

²⁶ Projects are usually financed by a mix of debt (raised by the concessionaire from banks and/or financial institutions) and equity (as infused by the sponsors). Lenders sign the common loan agreement and/or facility agreement with the borrower prior to disbursement of the loan. The borrower needs to pay the interest amount and the principal due as per the schedule in the common loan agreement. The loan agreement also provides for a cure period (period of default), where the borrower can pay the due interest and/or principal or both within the cure period by paying an additional penalty interest levied on the defaulted amounts. If there is a delay in payment of interest, principal, charges, or levies for more than the period on the scheduled date of payment (specified in the common loan agreement), a financial default is deemed to have occurred and the senior lenders may take remedial measures against the concessionaire as prescribed in the concession agreement.

letter of acceptance under FIDIC contracts (Sub-Clause 4.2 of FIDIC Suites 1999²⁷ and 2017²⁸ editions, FIDIC Gold 2008,²⁹ and FIDIC MDB 2010³⁰).

Performance security is required to be valid and in force until achieving the earliest of the following events: (i) the first anniversary of the appointed date or (ii) the concessionaire expending at least 30% of the BPC. The provision of performance security considers the fact that the concessionaire is partly financing the project. FIDIC contract forms would typically require the performance security to be valid and enforceable until the issuance of the contract completion certificate (FIDIC Gold 2008³¹), until the issuance of the performance certificate and contractor compliance with its obligation to clear the site (FIDIC 2017 Suite³²), or until the contractor has executed and completed the works and remedied any defects (FIDIC 1999 Suite³³ and FIDIC MDB 2010³⁴).

Additional details regarding conditions for replenishment by concessionaire and events of concessionaire default leading to appropriation of performance security by authority are indicated in Appendix 7.

10. Change of Scope

FIDIC red, yellow, and pink contract forms require that the independent engineer administers any variations under the concession agreement. Under HAM, however, any change of scope is ordered directly by the authority, and not by the independent engineer.

The concessionaire may by “notice” require the authority to consider changes of scope (variations) on two grounds: the necessity for providing safer and/or improved services to users of the project. The authority is required to give its decision accepting, accepting with modification, or rejecting the proposed change of scope within 15 days of the notice receipt. FIDIC contract forms (FIDIC Suite 1999,³⁵ FIDIC Gold 2008³⁶) do not prescribe specific timelines for the authority decisions.

Another feature that is distinct from the FIDIC contract forms is that before ordering the change of scope, the authority should make good faith efforts to reach a consensus with the concessionaire on the cost and time impact of the proposed scope change. If the consensus is not reached, the authority may order to proceed with the change of scope, pending resolution on the cost and time impact. Details regarding change of scope (variations) are indicated in Appendix 8.

²⁷ FIDIC. 1999. Conditions of Contract for Construction (First Ed. 1999). Conditions of Contract for Plant & Design-Build (First Ed, 1999) for Electrical & Mech. Plant & for Building & Engineering Works Designed by the Contractor. Conditions of Contract for EPC Turnkey Projects (First Edition, 1999). Geneva.

²⁸ FIDIC. 2017. Conditions of Contract for Construction (Second Ed. 2017) for Building and Engineering Works designed by the Employer. Conditions of Contract for Plant & Design-Build (Second Ed, 2017) for Electrical & Mechanical Plant & for Building & Engineering Works Designed by the Contractor. Conditions of Contract for EPC Turnkey Projects (Second Edition, 2017). Geneva.

²⁹ Footnote 23, para. 75.

³⁰ Footnote 22, para. 75.

³¹ Footnote 23, para. 75.

³² Footnote 28, para. 85.

³³ Footnote 27, para. 85.

³⁴ Footnote 22, para. 75.

³⁵ Footnote 27, para. 85.

³⁶ Footnote 23, para. 75.

11. Omission

If any part of the site becomes unavailable for over 180 days from the appointed date, works related to such site are to be omitted. The process for calculating the cost of reduced scope is indicated in Appendix 9.

All payments made to the concessionaire are adjusted and recoveries—if any—are made from the payment to be released to the concessionaire on the payment milestone immediately succeeding the date of finalization of the reduction in scope.

12. Bid Project Cost, Operation and Maintenance Cost, and Payment

Bid project cost. The BPC is the lump-sum cost of construction of the project as of the bid date, payable by the authority to the concessionaire for the execution and completion of the project and the remedying of any defects. This is the amount quoted in the bid by the winning bidder and is subject to adjustments following the terms of the concession agreement. The BPC in FIDIC contract forms' terminology is broadly like the accepted contract amount, but as of the bid submission date, instead of as of the base date. The bid date is the last date of bid submission. The BPC reflects the net present value (NPV) as of the bid date of construction of the project.

The BPC includes the cost of construction; working capital; interest during construction; physical contingencies; and all other costs, expenses, and charges for and with respect to construction of the project, but excludes adjustment for change in the price index, change of scope, change in law, force majeure, bonus, and damages for breach of the agreement.

O&M Cost. O&M cost is the lump-sum cost of O&M of the project, as of the bid date, payable by the authority to the concessionaire for the project O&M during the operation period. The O&M cost is computed based on the first-year O&M cost quoted in the bid by the winning bidder and is subject to adjustments for change in the price index and change of scope, following the terms of the concession agreement. The NPV of O&M cost as of the bid date is the product of first-year O&M cost and the number of operation period years. The O&M cost reflects the NPV as of the bid date of the O&M of the project.

Interest-bearing mobilization advance. The agreement provides an option for a mobilization advance, which is made on request of the concessionaire, typically for a sum not exceeding 10% of the BPC in two equal installments. The request for the first installment may be made at any time after the appointed date, subject to furnishing a bank guarantee for the same amount and in a form acceptable to the authority. The concessionaire may, in the same manner, request the second installment any time after 60 days from the appointed date. The authority would be required to pay each installment to the concessionaire within 30 days of receipt of its respective requests.

Unlike in FIDIC contract forms, the mobilization advance payment is not an interest-free loan. The loan is subject to the prescribed interest rate, compounded annually.

The mobilization advance must be repaid through deduction in four equal installments and the interest recovered as the fifth installment. In November 2020, the deduction schemes were staggered to eight equal installments for the principal, and the ninth and 10th installments for the interest.

Milestone payment during construction. The authority pays its share of the adjusted project cost—typically in five equal installments during construction (the installment payments were increased to 10 in November 2020)—linked with the achievement of the work progress milestone, after the

concessionaire has expended a predetermined portion of the project cost. The independent engineer is required to submit a report to the authority certifying the achievement of the designated payment milestones. During the finalization of the design up-front, the independent engineer weighs the value of all items in consultation with the authority responsible for making payments and recommends the percentage of physical progress achievements based on decided weights during the entire construction period. The authority is required to disburse an installment within 15 days of receipt of each report, which is typically equal to 4% of the BPC (assuming 40% funding during construction by the authority and 10 milestone progress payments), adjusted for the price index multiple as applicable on the reference index date (Appendix 10).

O&M payment. To support O&M expenses, a specified percentage of the project cost is paid biannually and the concessionaire is responsible for all expenses related to O&M. O&M payments due and payable to the concessionaire are made in two equal biannual installments and disbursed by the authority together with the corresponding installments of annuity payments. Each installment is subject to adjustment based on (i) the price index change on the reference index date preceding the due date of payment, compared to that on the reference index date preceding the bid date; and (ii) change in scope of the project.

Annuity payment after construction completion. The authority disburses the project cost balance—including underlying financing charges—in biannual installments spread over a pre-agreed period of O&M, commencing 180 days after the commercial operation date. Interest—which triggers at completion—is paid on a reducing balance of project costs at an interest rate equal to the bank rate plus 3%. In November 2020, the interest rate has been changed to the average of the 1-year MCLR of the top five scheduled commercial banks plus 1.25%.

Promotion of innovation. To promote innovation by providing flexibility to the private sector, core technical requirements of design, construction, and O&M are specified based on output-based (performance-based) specifications, focusing on the level of service for the users.

13. *Dispute Resolution*

Step 1: Optional mediation for amicable settlement. In the event of any dispute, difference, or controversy arising between the authority and the concessionaire, either must apprise one another in writing regarding the differences. Either party may call upon the independent engineer to mediate and assist the parties in arriving at an amicable settlement.

Step 2: Dispute resolution board for binding decision. In the case of non-resolution of the dispute by the independent engineer—or without its intervention—either party may approach the DRB following the procedure outlined in the concession agreement. The decision of the DRB—which has to be given within 56 days after receipt of all the pleadings (along with supporting documents) of the parties by the board unless otherwise mutually extended by the parties—shall be binding on both the parties unless the decision is revised and/or modified in a conciliation and/or arbitral tribunal.

Step 3: Mandatory conciliation before going for arbitration. If either party is dissatisfied with the decision of the DRB—and before approaching the arbitration tribunal—the parties are required to explore conciliation by the conciliation committee of independent experts set up the authority following the provisions of the concession agreement. If the conciliation process is successful, the parties sign the written settlement agreement and the conciliators authenticate it. The settlement agreement will be binding on both parties.

Step 4: Arbitration for final and binding resolution. If the dispute is not resolved by the conciliation committee, either party may refer the dispute to the arbitration tribunal for final and binding resolution. The arbitration is subject to the Government of India Arbitration and Conciliation Act, 1996, and is held following the rules of society for affordable redressal of disputes, New Delhi, or such other rules as mutually decided by both parties. The arbitral tribunal consists of three arbitrators. Each party will select one arbitrator and the third arbitrator is appointed by these two arbitrators through mutual agreement. The tribunal is required to make a reasoned award and the award will be final and binding on both parties.

14. *Insurance*

The concessionaire is required to procure and maintain—at its own cost during the construction and operation periods—insurance sums as required by the financing agreements, applicable laws, and as necessary following good industrial practice. The concessionaire is also required to procure insurances to mitigate risks that may devolve on the authority because of any act or omission of the concessionaire during the construction period. The authority will be co-insured in each insurance policy and the concessionaire is required to deposit the proceeds of the insurance into the escrow account (Appendix 11).

15. *Termination*

The agreement termination may occur either due to concessionaire default, authority default, or force majeure. The conditions leading to authority default are

- (i) the authority commits a material default in complying with any of the obligations of the concession agreement and such default has a material adverse effect on the concessionaire;
- (ii) the authority fails to make any payment to the concessionaire within the period specified in the agreement;
- (iii) the authority fails to provide—within 180 days from the appointed date—statutory clearances required for construction of the project; or
- (iv) the authority repudiates the agreement or otherwise takes any action that amounts to or manifests an irrevocable intention not to be bound by the agreement.

Various conditions constituting concessionaire default and corresponding termination payments are indicated in Appendix 1.

16. *Force Majeure*

Force majeure events are broadly classified into (i) nonpolitical events, (ii) indirect political events, and (iii) political events. The details of this classification and associated cost implications are indicated in Appendix 12. If a force majeure event subsists for 180 days or more within a continuous period of 365 days, either party may terminate the agreement by issuing a termination notice. The party intending to issue such a termination notice must inform the other party of its intention to issue such notice and grant 15 days to make a representation. After 15 days the concerned party may issue the termination notice, whether or not in receipt of the representation.

E. Features of the Hybrid Annuity Model Compared with Other Forms of Public-Private Partnership Contracts

Speculation in BOT-Toll coupled with the economic slowdown in 2012, a cautious approach adopted by lenders, and delays in site handover and regulatory clearances led to a slowdown in the implementation of PPP projects in the road sector. A risk balanced contract mechanism where partial project cash flows

during construction are assured by the authority—and which are subject to the fulfillment of performance standards specified in the concession agreement—is likely to help boost investor confidence in project participation.

HAM projects are viewed as “safe” returns, commensurate with the risks present in the contract structure, compared to other PPP models. PPP-Toll contracts are exposed to the volatility of traffic plying on the project stretch and provide opportunities to accrue significant “upside return” in proportion to the risks entailed. HAM contracts provide limited upside potential in equity returns primarily on account of operational excellence and/or financial engineering by way of cost reduction of funds. The risk-return profile matches with the expectations of investors who have long-term liabilities and who would like to invest in non-volatile products with a reasonably assured return. PPP-Toll contracts may appeal to risk-seeking private equity and infrastructure funds that employ cost optimization drivers and bet on appreciation potential of top line to leverage investor returns.

Compared to toll and annuity contracts, HAM contracts reduce the requirement of equity infusion and funds to be tied by the concessionaire. PPP-Toll and Annuity contracts both require 100% of the funds to be arranged from a mix of debt and equity. Since 2012, banks and financial institutions have become cautious when lending to infrastructure projects. As a result, many concessionaires were facing difficulties in achieving financial closure under contracts. They were constrained in demonstrating and securing the equity required for bidding and implementing the projects. HAM has brought relief to the concessionaires as the authority now injects a portion of the project cost during the construction period.

Even under HAM, banks and financial institutions are wary of funding the projects at high debt-equity ratios, except for large developers. Lenders viewed that the absolute amount of equity to be invested by the concessionaire was inadequate and ask for a higher proportion of equity contributions. Concessionaires faced issues bringing in additional equity, leading to delays in financial closure. This problem is more prevalent for small and medium-sized developers compared to large developers. Nearly 60% of HAM projects won by small and medium-sized developers during FY2017-FY2019 had reportedly faced delays in financial closure compared to large developers.³⁷

HAM enhances the bankability of projects by addressing the issues of termination payments for concessionaire default during construction: Earlier versions of PPP contracts for both BOT-Toll and BOT-Annuity projects had no termination payments if the concessionaire defaulted during construction. Lenders had been apprehensive of this and often asked the concessionaires to furnish shortfall undertakings or guarantees to provide security against the debt exposure. The absence of security cover by way of termination payment enhanced the “risk perception,” leading to pricing increases of debt products. Lenders and concessionaires have articulated the requirement of termination payment cover across the concession period, for default by both the concessionaire and the authority.

HAM has brought in an alternative concept where the termination payments during operations are linked to unpaid annuity amounts. Termination payments in previous versions of BOT-Toll and BOT-Annuity projects were linked to the liability (debt and equity). HAM brought in an alternative concept where termination payments during operations are linked to unpaid annuity amounts. This has removed the difficulty in interpretation of the debt due as well as adjusted equity as per the provisions of the contract, focusing on cash flows accruing to the concessionaire as the basis.

Change in ownership has been made favorable for HAM contracts compared to other PPP modes for secondary market transactions: Effective recycling of assets is important so that developers can reinvest

³⁷ Footnote 11, para. 18.

the equity in the construction of future projects. Previous versions of BOT-Toll and BOT-Annuity projects permitted divestment of 100% equity to the concessionaire only after 2 years post commencement of operations. The National Infrastructure Pipeline mandated investment of over \$290 billion to be invested in road projects between FY2020 and FY2025. MORTH—through NHA—awarded several HAM projects between FY2017 and FY2021, with many commencing operations during FY2021 (Appendix 13). BOT-Toll and BOT-Annuity projects awarded previously have already crossed the threshold of 2 years of ownership and are available for secondary market transactions. Modification to the clause pertaining to ownership in HAM projects (reducing the holding period from 2 years to 6 months post commercial operation date) needed to be done to enable early transaction of HAM assets in the secondary market.

Introduction of the dispute resolution board to help resolve contractual disputes promptly. Previous modes of PPP implementation mandated amicable settlement (which decision was not binding on the parties) followed by arbitration for resolving the disputes. This would lead to the formation of an arbitration panel for decision-making which would delay the execution of the project. To resolve contractual disputes, the modified HAM contract has introduced the DRB, whose decision would be binding on both the parties unless and until the same is not revised by the arbitration tribunal. The DRB mechanism ensures that all procedures are time-bound, providing an opportunity for due representation to the parties and providing timely decisions.

Despite high degrees of project readiness requirements, residual risks remain. HAM requires a high degree of project readiness, including the provision of 100% environmental and forest clearance, and at least 80% site availability at the start of construction. It is imperative to mention that all modes of PPP implementation—including HAM—are still exposed to project risks such as delays in remaining site handovers, utility shifting, and work scope change during construction.

F. Comparison of the Hybrid Annuity Model with National Highways Authority of India Engineering Procurement Construction Contracts

Contract structure in PPP HAM projects and NHA EPC projects differ on risk allocation and accountability. PPP contracts perform to minimize the whole life-cycle cost without compromising on the quality of construction and operation. EPC contracts ensure that the quality of construction adheres to the specified construction standards and that all performance parameters are linked to construction. There are also variations within the EPC contract where construction standards are bundled with project maintenance for a stipulated period. For this study, features of HAM have been compared with EPC contracts that are being used by NHA. Differences have been observed in aspects such as obligations to the contractors, performance security requirements, rights-of-way, design and construction, quality assurance and monitoring, maintenance, scope change requirements, safety and emergency requirements, defect liability, payments, etc. There is no financing risk associated with EPC contracts as the entire payment is guaranteed by the authority, subject to fulfillment of milestones stipulated in the contract. This is in contrast with PPP HAM projects where the concessionaire must finance a portion of the project cost, typically achieved through a mix of debt and equity during the concession period. The construction period under HAM is typically longer than under EPC because EPC does not require a development period.

Government support during the construction phase has also been observed in the Indian metro rail sector. However, there was a marked difference in the financing sources for the project. The Delhi Airport Express Line project was financed through a mix of government equity infused in the project and an arrangement of funds (both debt and equity) by the concessionaire. The Delhi Airport Express was constructed at an estimated cost of \$427 million and was funded through funds from the Delhi International Airport Limited, equity infused by the Government of India and the Government of National Capital Territory of Delhi, and debt and/or equity raised by the private concessionaire. The

project is being operated on a PPP model where the fare or non-fare revenues are being utilized for servicing debt obligations.³⁸

The risk-reward principle is “different” in the implementation modes. EPC contracts being used by NHAI involve milestone payments, i.e., contractors are paid their invoices periodically. EPC contracts do not involve high capital involvement as seen in PPP HAM projects where debt and equity of the concessionaire are tied up. The “risk-reward” level in PPP HAM projects is higher than in EPC projects. EPC project bonuses are capped to the contract price, but PPP HAM projects do not have any maximum limit on the bonus payment accruing to the concessionaire for early completion which is beneficial to the concessionaire. The HAM concessionaire can complete the project early, obtain the bonus payment, and reduce its dependence on additional funds for financing its O&M and any debt obligations.

Mobilization payment clauses are broadly similar. Both HAM and EPC models provide provisions for the concessionaire and/or contractor to opt for mobilization advances to commence the construction process. With HAM, the mobilization advance is provided in two equal installments against the submission of a bank guarantee for an amount equal to 10% of the BPC. EPC project (NHAI) mobilization advances equal 10% of the contract price. Both models provide specified liquidity to the concessionaire and/or contractor for the execution of the contract.

Maintenance obligations in HAM are likely to bring more innovation and value for money to the project. After construction completion, the EPC contractor is responsible for rectifying any defects that occurred only during construction. Contractor undertaking for O&M activities—if bundled with the EPC contract—is usually limited to a fixed period of 5 years. The O&M responsibility, therefore, lies with the authority or is executed through a separate contractor engaged by the authority. The EPC contractor has less incentive to innovate or optimize the whole life-cycle project cost apart from its savings during construction. The PPP HAM concessionaire is responsible for constructing as well as maintaining the project until the end of the concession period. The concessionaire is more likely to optimize construction and maintenance costs across its life-cycle through innovation.

The inherent nature of payment structure has also caused varied termination structures under the different modes of contracts. PPP HAM projects are riskier than EPC projects because the return on the invested fund starts in the operations period, subject to fulfillment of the performance indicators. This contrasts with EPC contracts where payments are made regularly on the achievement of milestones. For comparison purposes, in case of a termination, the amount of payment at risk in an EPC contract could be the amount of unpaid work executed (i.e., the difference between the costs incurred until termination date and the amount invoiced to the authority). In a PPP HAM, however, implementing agencies are required to make termination payments linked to the costs incurred, on account of both, the concessionaire’s as well as authority’s event of default—making the project bankable.

Appointment of the supervising engineer is different. The risk–reward methodology for a supervising engineer is different in EPC and PPP HAM contracts. The supervision approach in EPC transforms into a partnership approach in PPP contracts. The EPC contract—being a short-term contract—demands supervision by an engineer who monitors the project on behalf of the authority. In an EPC contract, the “authority engineer” is selected and compensated by the authority. PPP HAM projects are long-term projects which require a partnership approach, and selection of—and equal share of payment to—the independent engineer is done through mutual consent.

³⁸ For the Delhi Airport Express Line, the project cost was estimated to be \$427 million, out of which Delhi International Airport Limited infused a grant of \$48 million (₹3.5 billion), and the Government of India and the Government of the National Capital Territory of New Delhi contributed 19% each. The concessionaire had brought in 15% equity and the remaining (35%) was domestic loans arranged from banks or finance institutions. The extension of the Airport Express Link was done on a similar basis. (Source: Metro Rail Projects in India: A study in Project Planning authored by M. Ramachandran, 2011).

17. Hybrid Annuity Model Contracts in the Water Sector

HAM has been extended to the water sector under the Government of India National Mission for Clean Ganga (NMCG) for constructing and operating sewerage treatment plants. Under HAM contracts, these sanitation projects are being implemented in Haridwar, Mathura, and Varanasi.³⁹

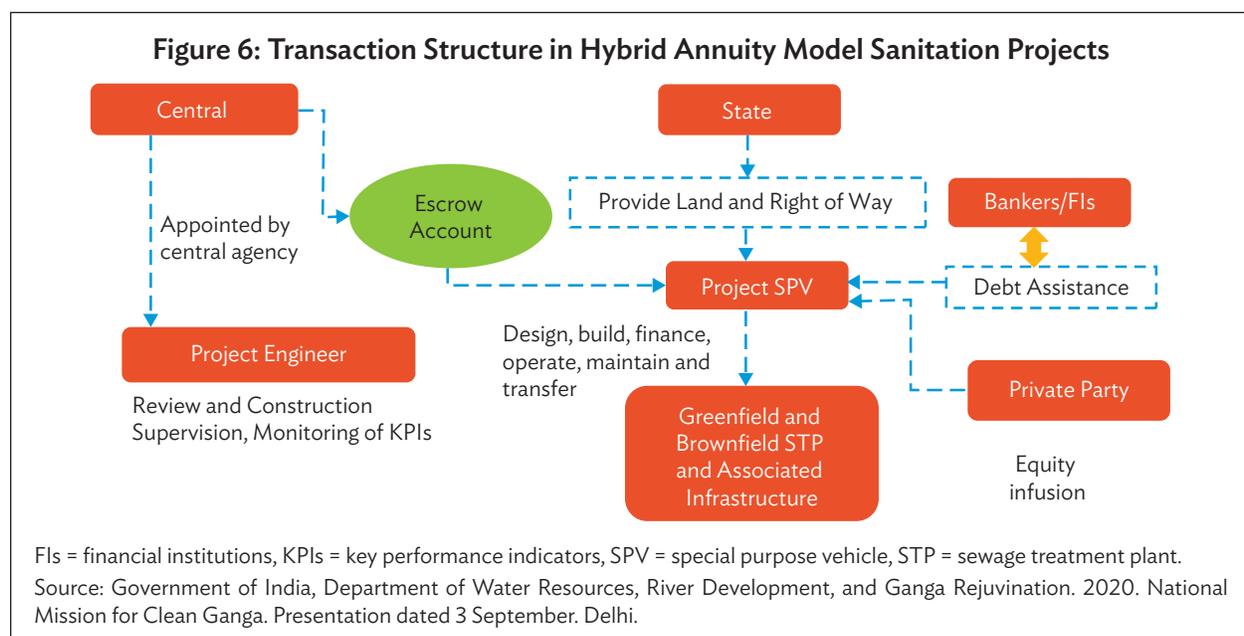
A key feature of the usage of HAM contracts in these projects is that both the annuity and O&M payments are linked to key performance indicators of the created assets to ensure better accountability and efficiency of the assets.

Following the experience of HAM in the road sector—and a market-sounding exercise undertaken by the authority—customization of the contracts has been done to increase the confidence of private investors in the water sector. The following section highlights such measures:

A tripartite agreement is signed instead of a bipartite agreement: A tri-partite agreement is executed between the central government agency, a state government urban local body, and a private party. This is a deviation from road projects, where the contract is executed between the government agency (state and/or central) and a private party.

In water sector projects, the role of the authority is bifurcated. The responsibility of ensuring land is free of encumbrances, and that necessary approvals are available for a concessionaire to undertake project activities and design approvals lie with local bodies (for example, Uttar Pradesh Jal Nigam for the project in Varanasi). The central agency ensures financing assistance is provided to the project, operation of the escrow account is maintained at its minimum escrow balance, and appoints the project administrator.

Figure 6 indicates the transaction structure being adopted in HAM sanitation projects.



³⁹ Government of India, Department of Water Resources, River Development, and Ganga Rejuvenation. National Mission for Clean Ganga.

The responsibilities of the central agency are to ensure that payments to the concessionaire are made on achievement of project milestones during the construction period and adherence to O&M obligations based on certification of the state agency. The central agency also ensures that the escrow account is funded with the minimum escrow balance.

The state agency is responsible for providing technical due diligence to the project including all the necessary support required by the concessionaire to successfully execute the project. The state agency is responsible for providing the right-of-way to the concessionaire along with aiding in obtaining the necessary approvals. The state agency needs to highlight the discrepancies—if any found—for non-adherence to obligations of the concession agreement. Payment is made to the concessionaire based on certification by the state agency.

The concessionaire is responsible for the overall construction of the project along with taking care of O&M obligations. The concessionaire is also responsible for funding the project partly at the initiation stage of the project through the infusion of equity.

The major differences between HAM sanitation projects and HAM road projects are

- (i) **Divestment is allowed 3 years compared to 6 months after commercial operation date (COD) in road projects.** The lead member of the consortium in sanitation projects needs to hold 26% of concessionaire equity until 3 years after COD. This provision compares with an original lock-in period for road HAM projects of 2 years post COD. This was reduced to 6 months in November 2020. HAM sanitation projects are relatively new to ensure operational performance, and longer lock-in periods may have been introduced. The concession agreement also requires that incoming members have O&M experience in case there is a change in the ownership structure of the special purpose vehicle (SPV), as specific technical knowledge is required for operating sanitation projects.
- (ii) **Conditions precedent.** An important requirement for the concessionaire to satisfy conditions precedent in sanitation HAM projects is the submission of designs and drawings, a construction plan, and an environmental health and safety plan. The concessionaire must also submit to the authority a technology license agreement. Sanitation projects require the development of complex asset inventories, which is why up-front submission of designs and technology agreements are sought. Such requirements are not observed in HAM road projects.
- (iii) **Shorter duration for the achievement of conditions precedent.** Conditions precedent for sanitation projects need to be achieved within 120 days, unlike HAM road projects, where conditions precedent must be satisfied within 150 days of the signing of the concession agreement. A probable reason for the lower duration in sanitation projects may be attributed to the relatively lower requirement of land area compared to road projects. Sanitation projects are dependent on volumetric considerations of sewage treatment compared to the linear alignment required for road projects, where an encumbrance-free stretch of land is essential to initiate project construction. If it is difficult to acquire a portion of land for a sanitation project, the design can be optimized to achieve envisaged sewage treatment targets.
- (iv) **Unbalanced risk allocation for non-achievement of conditions precedent.** If the parties do not achieve conditions precedent due to reasons beyond the control of either party, the development period can be extended from the date of signing of the concession agreement to a maximum period of 6 months, after which the agreement is terminated. This contrasts with road projects where the development period can be extended for up to 1 year from the signing of the agreement subject to payment of damages. HAM sanitation projects are

also distinguished by damages imposed if there is a delay in the achievement of conditions precedent due to reasons within the control of the parties. The agreement empowers the state authority to forfeit performance security to a maximum of 20% of the submitted amount if a concessionaire defaults. If the authority defaults, no monetary penalty has been stipulated for the authority. The authority is obligated to return the performance security if it defaults for non-achievement of conditions precedent as stipulated in the concession agreement. To ensure bankability and equitable risk allocation, it may be necessary to balance the risk between the stakeholders.

- (v) **Under water sector projects, authority bears the cost of the project engineer.** The project engineer in sanitation projects has a similar role to that of the independent engineer in road projects. The responsibilities of the project engineer include inspection of the site during both the construction and O&M period, and bringing any discrepancies to authority notice. Unlike road projects where there is equal sharing of the remuneration of the independent engineer between the authority and concessionaire, the authority provides complete remuneration of the project engineer. Although the project engineer is expected to offer unbiased recommendations during the project, this clause mandating entire remuneration payment by the authority may lead to the risk of conflict of interest in making neutral recommendations.
- (vi) **Requirement of a floor cost at financial closure to prevent aggressive bidding.** Submission of financing agreements forms a part of the obligations of the concessionaire for the declaration of appointed date (HAM road projects) and effective date (HAM sanitation projects). However, unlike road projects based on HAM, the model concession agreement for sanitation projects does not mandate a minimum amount for which financial closure needs to be achieved. The concessionaire in HAM projects is required to undertake financial close for an amount not lower than either total project cost or 10% less than estimated project cost minus 40% of the BPC. In addition, damages for the delay in the achievement of financial closure are not stipulated. Clauses relating to financial closure may need review as the water sector matures. Ensuring a floor cost at financial closure is likely to prevent aggressive bidding from the private sector.
- (vii) **Maintaining balance in an escrow account to ensure bankability.** In sanitation projects, an escrow account is maintained by the central agency. The concession agreement requires the central agency to maintain a minimum escrow balance to cater to the construction and O&M payments. The details of the minimum escrow balance are as follows:
 - (a) From the declaration of effective date until the construction completion period, the central agency undertakes to ensure that the escrow bank is funded with a minimum of two construction payments.
 - (b) Between the COD and O&M periods, the central agency funds the account with CAPEX annuities (along with interest), O&M charges, and power charges for the next 2 years.

Stakeholder consultations reveal that measures were undertaken to instill confidence and provide revenue visibility to the developers and the bankers. This escrow arrangement is expected to increase the bankability of the project by providing comfort to both bankers and concessionaires as it considers the minimum subsistence revenue required to successfully continue the project. It also assures the bank about the availability of funds concerning debt servicing with minimum financial support guaranteed by a central government-backed agency.

Time period for substitution reduced to 3 months. Lenders have been given the right to substitute the concessionaire in the event of default during project progress. However, the time to replace the

concessionaire is 3 months instead of 6 months as provided in the road sector. Given the critical nature of the sector—along with the technological capability required for the incoming concessionaire—a shorter duration for substitution may have been considered.

Higher amounts and longer periods of performance security in water sector HAM. Concessionaires in water sector HAM projects are required to submit the performance security (which is equal to 10% of the BPC) and O&M security (which is equal to 5% of BPC). Performance security for road projects is mandated during the initial stage of the construction period and is not required during the operations period. Lock-in periods for both sectors are different. The lock-in period for sanitation projects is 25 months or 1 month post COD—whichever is later—whereas the lock-in period for road projects is 1 year or until 30% of the project cost is expended, whichever is earlier. Sector maturity and lower technological complexity may be the reasons for lower lock-in periods of performance security for road projects. The sanitation sector is less mature, has fewer players, and has specific technology requirements. To bind the developers with performance obligations for a longer period, a higher lock-in period for performance security may have been mandated. Unlike road projects, sanitation projects also require submission of O&M security which must be renewed every 11 months during operations. Submission of O&M security is considered an important parameter to ensure that concessionaires adhere to key performance indicators during the operations period.

Completion certificate is issued only after the test on completion. The granting of the completion certificate in sanitation projects requires approval of as-built drawings of the construction period and compliance with prescribed key performance indicators for a continuous period of 20 days within a trial operations period of 3 months. There is no provision for the issuance of punch list items or the issuance of a provisional completion certificate as observed in HAM road projects. Unlike under HAM road projects, the onus for the issuance of completion certificate lies with the state agency rather than the project engineer.

Variation in mobilization advance payment. The mobilization advance accounts for 10% of the BPC for both sanitation and road projects, but there is a difference in the disbursement procedure. A road project mobilization advance is paid in two equal installments with a gap of 60 days between the installments. A water sector advance is paid in one installment within 30 days of achieving the conditions precedent. Sanitation projects levy 8% simple interest on the mobilization advance. Lower interest rates—along with a simple interest model of computation—help reduce the interest burden on the concessionaire considerably. Stakeholder consultations undertaken for this paper reveal developer concerns about comparatively higher interest rates (compound interest model of computation) levied on mobilization advances for existing HAM road projects (around 8.45% as of 2021).

Variation in milestone-based progress payments during construction. The concession agreement for sanitation projects fixes milestones based on lapses of predefined months rather than on the achievement of specific physical progress percentages as defined in road projects. Physical progress percentages linked to milestone payments in road projects incentivizes adherence to timelines by the concessionaire.

Payment frequency is different for both models, depending on the maturity and financial profile of the developers. Balanced CAPEX annuities (60% of BPC) and O&M (lump-sum value quoted at the time of the financial proposal) are paid quarterly for sanitation projects. Road project payments are made on a biannual basis. Concession agreements for sanitation projects also require payments of power charges, which are paid at actuals and are subjected to a cap on the power charges based on guaranteed energy consumption. Interest rates on these payments are also higher compared to HAM road projects. NMCG project interest rates are expected to lie in the range of 10% during 2021 (State Bank of India 1-year MCLR rate +3%).

The evolution of PPP models is a key to both its emergence and success. HAM emerged primarily due to a drop in demand for previous PPP implementation due to factors such as delays in land acquisition and environmental clearances, speculation, and the exuberance of bidders. The global economic slowdown in 2012 also led to a fall in demand and increased financial distress for some projects. Large debts taken for the financing of projects lie as non-performing assets in bank balance sheets in 2021. The new HAM combining features of EPC and BOT-Annuity models focuses on sharing controllable risks rather than transferring entire risks to the private sector. This has resulted in a better public-private interface.

Hybrid annuity has also had its share of criticism. HAM is considered complex as it requires the calculation of the net present value (NPV) of the BPC, which requires assumptions of discount rates and inflation indices. Given the lower amount of equity investment required by private investors, this has led to small and medium-sized developers entering the space. Constrained financial profiles have caused banks to limit their exposure to such bidders. Some banks also argue that the model did not bring required clarity to the computation of debt dues at different project stages, the extent of government guarantees, and government accountability provisions.⁴⁰ Given uncertain times in 2021, the PPP HAM has emerged to be one of the better-performing models within project structures. Streamlining the concession construct based on the requirements of the project participants would help enhance its success even more.

III. HYBRID ANNUITY MODEL CONTRACTS: EXPERIENCES

A. Introduction

HAM has emerged as one of the most preferred models of road development in India and approximately 8,000 km of road construction has been implemented using this model.⁴¹ Following the decrease in the PPP model (BOT-Annuity and BOT-Toll) of implementation, this "risk-balanced" structure found takers, and approximately 5,600 km were awarded between 2017 and 2018. The National Highways Authority of India (NHAI) has also implemented HAM in Gujarat, Karnataka, Madhya Pradesh, Maharashtra, and Rajasthan. Many of the programs were also assisted by multilateral funding agencies. The following section details experiences implementing these programs.

B. Implementation of Projects in National Programs

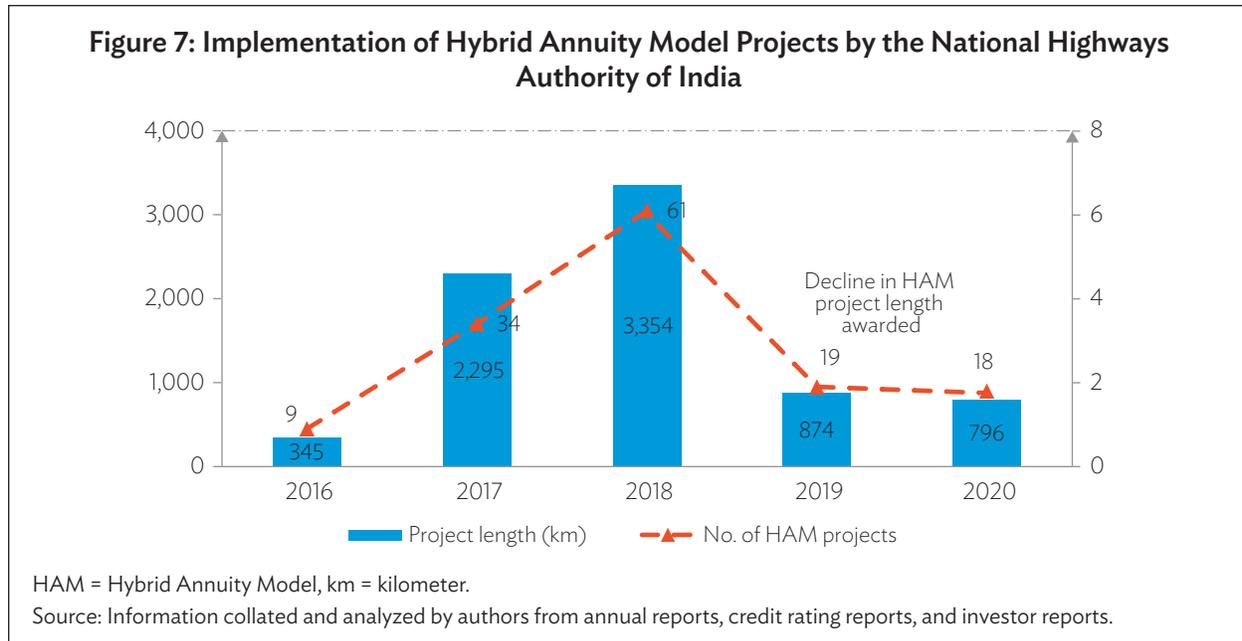
NHAI has implemented approximately 8,000 km under HAM. There was a demand for HAM projects from 2016 to 2018, but demand declined during 2019-2021.⁴²

The trend of the decline in the length of the HAM projects awarded may be primarily attributed to difficulties faced by developers in achieving financial closure, delays in land acquisition by the authority due to increased costs, a cautious approach of banks lending to HAM projects, the COVID-19 situation, and a reduced risk-taking appetite of developers due to their large order books.

⁴⁰ CARE Ratings Ltd. 2019. *Hybrid Annuity Model-Developing Cracks?*

⁴¹ Government of India, National Highways Authority of India. 2019-2020. *Bid Awarded in the Current Financial Year.*

⁴² Information collated through primary stakeholder consultations, annual reports, credit rating reports, and investor report analysis.



C. Profiles of Companies Involved in Hybrid Annuity Model Projects

HAM—being a risk-balanced structure—saw considerable involvement of large EPC companies. Many of the companies (including Dilip Buildcon, PNC Infratech, Sadbhav Infrastructure, MEP Infrastructure Developers, Ashoka Buildcon, GR Infrastructure, and Welspun) had bid and created a considerable order book of PPP HAM projects. The cumulative value of the BPC in PPP HAM projects of these companies was found to be approximately \$10 billion as of August 2020.⁴³

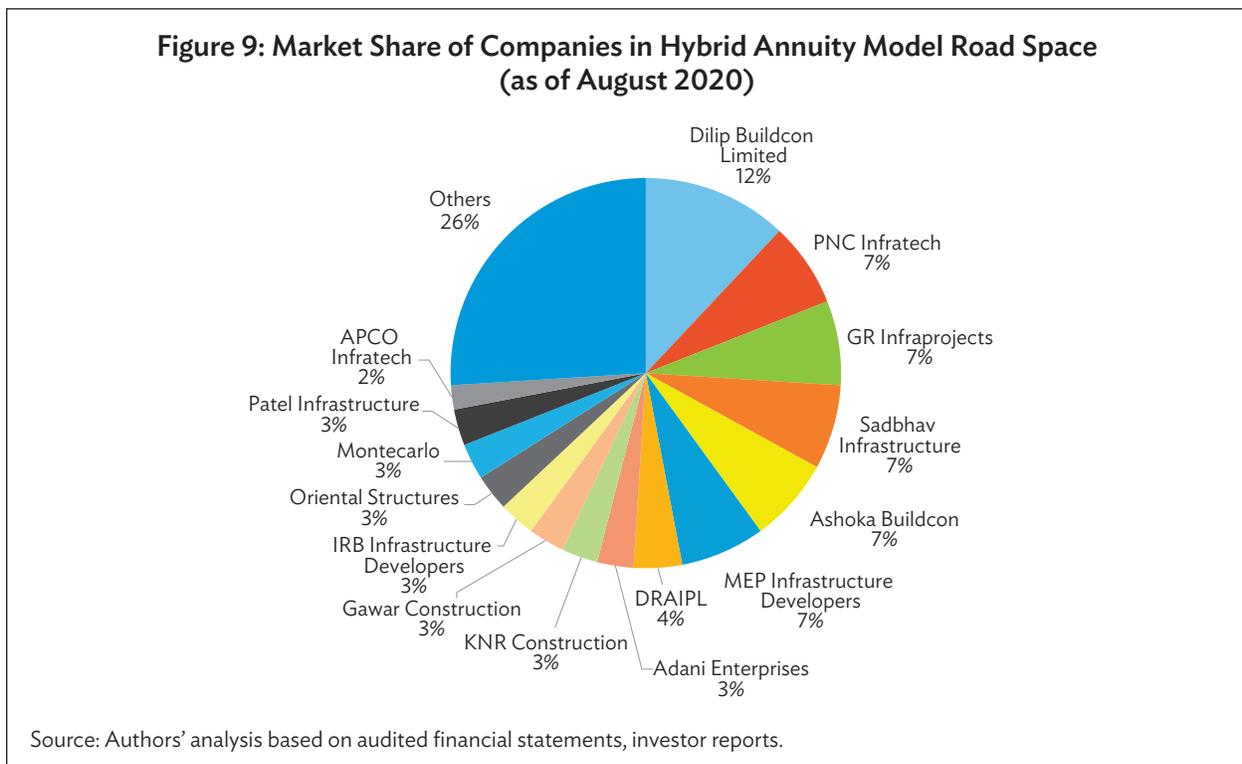
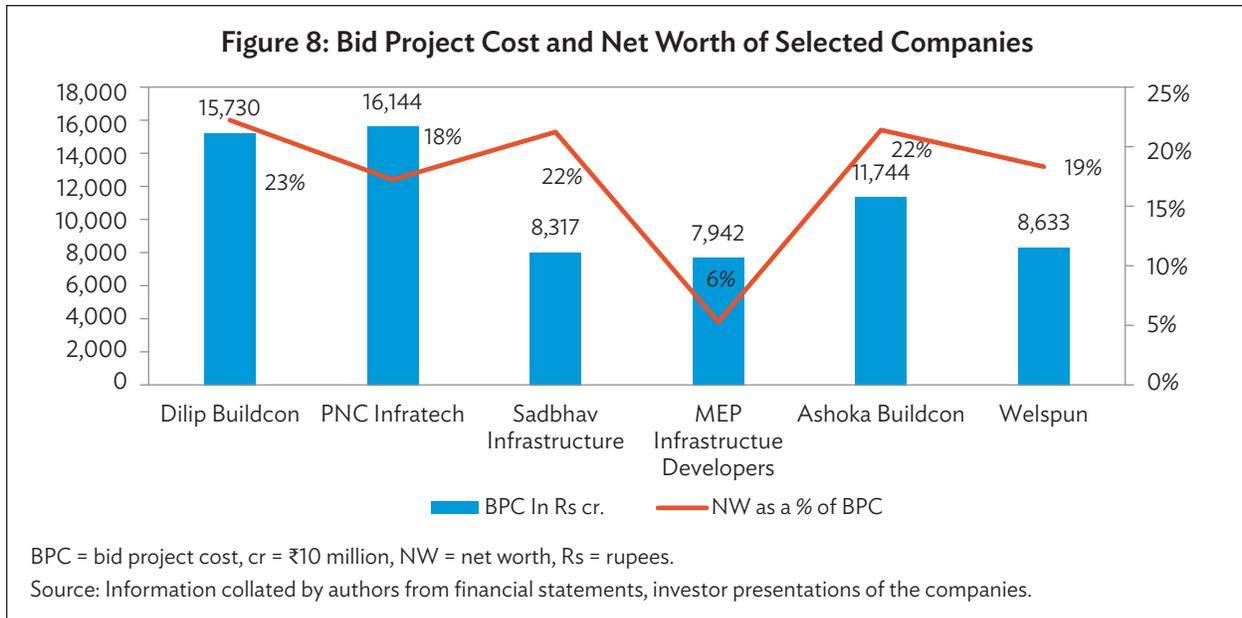
Plotting the net worth of these companies against the BPC of projects, the total net worth of most of the companies is lower than 25% of the BPC of the projects (Figure 8). Assuming a debt-equity ratio of 1:3, it appears that the net worth of each company is tied up in executing their order book, constraining them from bidding on other future projects. This may explain why projects being awarded on HAM saw limited participation in bidding after 2019. Approximately seven to nine bidders participated in HAM projects in 2017–2018 which reduced to four to five players in 2019–2020.⁴⁴

To enhance the participation of bidders in HAM projects, MORTH lowered the required financial capacity of bidders.⁴⁵ This saw the emergence of small- and mid-sized developers bidding for HAM projects. Several contractors such as Patel Infrastructure Limited, Montecarlo Limited, and HG Infra Limited were awarded HAM projects. The market share of developers of HAM projects (as of August 2020) is detailed in Figure 9.

⁴³ Obtained from annual reports and corporate websites of the mentioned firms.

⁴⁴ Obtained via primary stakeholder consultations undertaken with implementing agencies, contractors, and lenders and/or finance institutions.

⁴⁵ Under the modified rules of participation, a bidder will be qualified to bid for a HAM project if it has a minimum net worth of 15% of the estimated project cost at the close of the preceding fiscal year. Earlier, the floor was 25% (Circular No: NH-35014/25/2017-H dated 15 October 2020).



Multilateral funding agencies such as ADB have started to participate in lending to the private sector to develop HAM road projects.⁴⁶ The positive development impact of such initiatives—complementing with the development objectives of multilateral agencies—augurs well for participation in the future.

⁴⁶ ADB. 2020. *Report and Recommendation of the President to the Board of Directors: DBL Anandapuram Anakapalli Highways Private Limited*. Manila.

1. Experience in Implementation of Hybrid Annuity Model Projects

Introduced in 2016, HAM has been able to fast-track the development of roads through PPP. The momentum seen when the model was introduced in 2016 started to moderate in 2019. The following observations were observed while charting the chronology:

Bidding intensity which peaked in 2017–2018 moderated owing to lack of supply. The competition intensity for bidding on HAM projects reduced primarily because of the large order backlogs of major EPC contractors. The profile of companies bidding for HAM projects also changed (several small- and mid-sized companies started bidding). The creditworthiness of small and medium-sized contractors was not able to instill confidence in banks and finance institutions. Owing to the size of the debt exposure, lenders imposed stringent conditions including higher equity commitments, up-front equity infusion, and disbursement of a loan only after a threshold limit of physical progress is achieved. The smaller developers faced issues in achieving financial closure. A leading credit rating agency reported that while 75%–80% of projects bid on by large developers were successful in achieving financial closure, the number was lower for small and medium-sized developers (65%–70% of the projects achieved financial closure).⁴⁷ Many small companies entered the HAM segment and bid aggressively. Research conducted by a leading credit agency indicated that 40% of projects bid on by smaller companies were priced 10% below the lowest tender or the authority cost. In contrast, the price of the majority of projects bid on by large companies was 10% higher than the authority’s cost estimation. It was also observed that over 60% of the smaller companies achieved financial closure at a debt–equity ratio of less than 3. More than 60% of the larger companies achieved financial closure at a debt–equity ratio of more than 3. This was a clear indication that the banks wanted the smaller companies to bring in more equity to ensure the financial viability of the project. Most of these smaller companies already operated in the EPC space.⁴⁸ The initial exuberance and resultant aggressive bidding in HAM projects was unsustainable which led to the distressed sale of several under-construction assets.

Cautious lending has forced banks to restrict the availability of bank guarantees to developers and/or contractors to be used as performance security. The weak profile of public sector banks—coupled with increased risk perception of the “infrastructure sector” and the COVID-19 situation—has made them averse to enhancing their fund and non-fund exposure. The weakened cash flow profile of the companies may have also restricted the participation of companies in HAM projects. Table 4 indicates risk analysis before the declaration of financial closure by the concessionaires.

Table 4: Typical Risk Matrix Associated with Achieving Financial Closure

Equity Requirement	Risk Associated with Scoping of the Project	Availability of Bank Products for Performance Security
<ul style="list-style-type: none"> Higher and stringent requirements of equity mandated by the lenders resulting in delays in infusion by promoters in project Up-front equity investment and loan disbursement post 30% project progress results in delay in projects 	<ul style="list-style-type: none"> Disputes between concessionaires and the authority hinder project progress Deferral in disbursement owing to limited clarity in resolution of descopeing 	<ul style="list-style-type: none"> Weaker health of public sector banks and weakened economic profile of developers have made bankers cautious in extending financial assistance to contractors Limited cash flow available with contractors to pay due to invocation

Source: Based on stakeholder interactions.

⁴⁷ CRISIL Infrastructure. 2019. *HAM paves ahead, but cracks appear, too.*

⁴⁸ Footnote 10, para. 17.

The central government has taken note and relaxed the financial qualifications required of bidders for HAM projects. Under the modified rules, bidders can bid if their net worth (in the preceding year) is 15% of the estimated project cost compared to 25% as required previously.⁴⁹ This step is expected to increase the participation of both smaller and larger bidders in HAM projects enhancing competition. Central and state governments have been implementing the National Infrastructure Pipeline (approximately \$290 billion of road projects will be implemented during 2020–2025) and the “supply” side must not get constrained as a result.

Stronger developers have shown greater execution capabilities than those who are not. Financially healthy firms (with a good credit rating) have generally completed projects on time. Analysis of HAM projects by a reputed credit rating agency has shown that only 20% of the projects belonging to strong firms have not been able to complete projects on time, 75% of the projects financed by moderate sponsors have suffered delays, but all the projects belonging to weak firms have exhibited delays.⁵⁰ A very strong correlation is exhibited among projects suffering delays and the deteriorating financial health of the developers.

Having a high order book for an HAM contractor may mean future stability and continuity of cash flows. The completion of projects must be done in a time-bound manner. Execution of a high order book of projects puts additional pressure on machinery, material, human resources, and capital resources (factors of production) of the private sector. Unless the concessionaire exhibits a commensurate increase in the availability of its factors of production, it would not be able to execute its projects on time. A strong project monitoring mechanism is likely to be helpful to report any deviations in performance and make timely corrective actions to ensure project delivery.

Despite the requirement to provide at least 80% of the site at the commencement of construction, land acquisition delay is still a major cause of project completion delay. New land acquisition laws have significantly increased costs of land acquisition for implementing agencies. From an average of approximately \$130,000 per hectare in 2013, land acquisition costs had increased to \$350,000 per hectare in 2019 for MORTH.⁵¹ It is estimated that nearly 25% of project implementation costs are incurred through land acquisition. As reported by a leading credit agency, out of a sample of 24 HAM projects, nearly 20% were delayed purely due to land acquisition, and 33% were delayed due to both land acquisition and developer-related issues.⁵² For example, it was found that a HAM project with a construction period of 2 years was not completed 4 years after the appointed date, as 10% of the sites were still not available. This demonstrates that land acquisition still is one of the major factors affecting project progress. Table 5 summarizes issues faced in land acquisition and clearances during the construction period.

Table 5: Issues Faced in Land Acquisition and Clearances During the Construction Period

-
- (i) Delayed availability of land and clearances have affected the project progress of HAM projects.
 - (ii) Delay in the declaration of appointed date owing to delay in handover of encumbrance free land.
 - (iii) Developers accepting land only post 3G (determination of compensation for land acquisition) notification.^a
-

HAM = Hybrid Annuity Model.

Note: 3G refers to determination of compensation for land acquisition.

Source: Analysis by authors.

⁴⁹ Government of India, Ministry of Road Transport and Highways. 2020. *Relaxation in technical and financial qualification for bidders of National Highway projects under Hybrid Annuity Model (HAM) and Build, Operate and Transfer (BOT)*. Delhi.

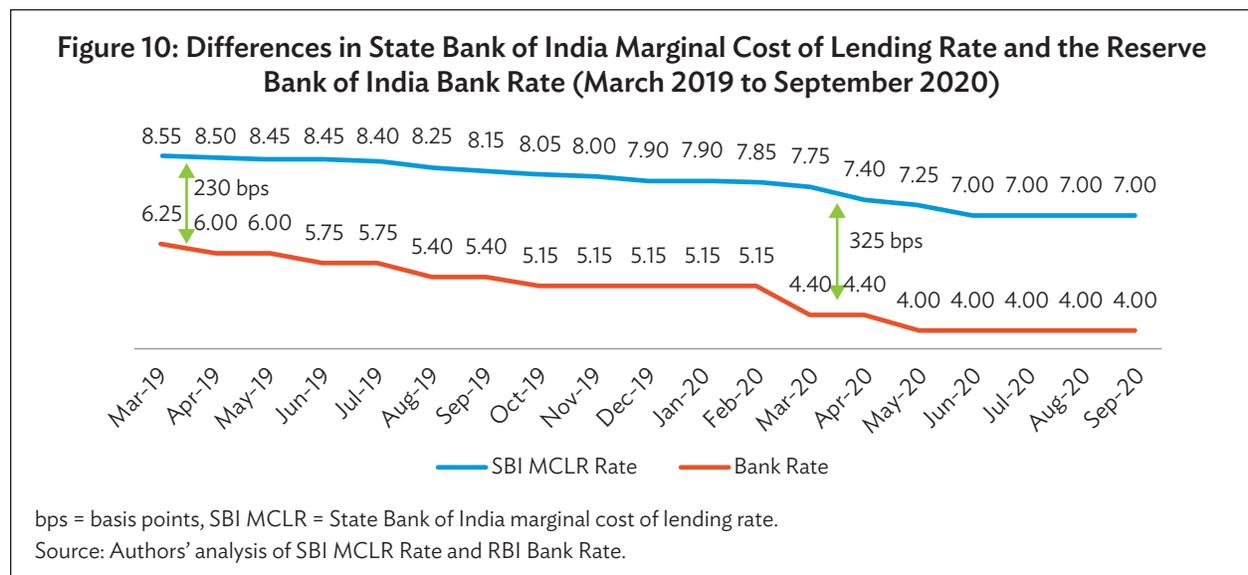
⁵⁰ CARE Ratings Ltd. 2020. *Journey of HAM – HA story so far*.

⁵¹ Department-related Parliamentary standing committee on Transport, Tourism and Culture presented to Rajya Sabha, 278th Report. 12 March 2020.

⁵² ICRA Limited. 2020. *Three out of five HAM projects witnessing delays in execution*.

HAM concession agreements require omission of the work scope and adjustments to compensation if the authority is not able to provide the required land within 180 days of the appointed date. If the concessionaire completes the project on the remaining land, the authority permits the issuance of a provisional completion certificate. The authority is then required to modify the scope and reduce the completion cost, annuity, and O&M payments as mutually agreed with the concessionaire. Modification of scope and completion cost often leads to disputes between the developer and the government. Timelines are not fixed for the resolution of disputes, so lenders often delay disbursement until the disputes are resolved. This can lead to a scarcity of funds and reduce project progress which leads to a deterioration in project viability. The revised PPP HAM contract provides that if the authority is unable to provide the balance of the disputed site land within 180 days from the appointed date, such land shall be removed from the scope of work.⁵³ This provision is expected to add the element of time-bound resolutions which will assist both developers and lenders.

Bank rate reduction eroded equity returns and reduced bankability of projects; MORTH amendment of reference rate provided relief to concessionaires. In the concession agreement, the interest payment to the concessionaire and interest to be paid by the concessionaire on the mobilization advance are both linked to the bank rate. The bank rate serves as a proxy to the lending rate of banks and finance institutions. To infuse liquidity into the economy, the Reserve Bank of India (RBI) reduced the bank rate from 6.25% in March 2019 to 4% in May 2020. The bank rate reduction did not translate into a reduction in the marginal cost of the funds-based lending rate (MCLR) of leading banks. For example, to reduce the RBI bank rate by 225 basis points, the reduction in the 1-year State Bank of India MCLR was only 130 basis points. While the income was accruing at a lower interest rate, interest paid by the concessionaire was pegged to a higher rate. A high-level estimate conducted by a leading credit rating agency suggests that for every 25-basis-point decrease in the interest reference rate, the average debt service coverage ratio decreases by 2 basis points.⁵⁴ With margins being thin in BOT-Annuity projects, variations in interest rates impact the feasibility of HAM projects.



⁵³ Government of India. 2020. *Public Private Partnership in Highway Development: Model Concession Agreement for Hybrid Annuity Project*. Delhi.

⁵⁴ Footnote 52, para. 156.

Assessing the financial impact suffered by the concessionaire, in November 2020 MORTH changed the reference rate from bank rate to the average of the MCLR of the five largest Indian banks plus a margin of 125 basis points. This substantially hedges the liability as both the interest income as well the interest payment is linked to the same variable.

Project completion delay. A sample set of 18 completed HAM projects was studied to analyze the percentage delay in project completion (Appendix 13). The average time for project completion was found to be 906 days (2.5 years). In the sample set of projects considered, 50% of the projects were delayed. The average delay observed in these projects was 229 days. The reasons for delays can be attributed to land acquisition issues, pending environmental clearances, encumbrance-free highway stretches, or delays in shifting of utilities. The other 50% of projects were completed on or before schedule. Stakeholder consultations revealed that a high level of project preparedness and planning by implementing agencies, use of standardized bidding and project agreements, and increased communication between all stakeholders helped in the early and/or timely completion of projects.⁵⁵

D. Hybrid Annuity Model Implementation in State Highway Programs

HAM was first piloted in the state of Karnataka as part of a program funded by the World Bank Group under the second Karnataka State Highway Improvement Project in 2012. Since then several HAM projects have been implemented in the state. Data on select projects were analyzed to understand the performance of the project from development to construction. It was observed that though most of these projects were delayed achieving their appointed date, most were able to achieve project completion within stipulated timelines. Stakeholder consultations revealed that a high level of project preparedness and planning by the state departments, use of standardized bidding documentation, and proper supervision from the multilateral organizations had helped in early and/or timely completion of projects.

The Government of Rajasthan Public Works Department planned to develop its state highway network with private sector participation. It had undertaken several initiatives such as constituting an institutional setup, implementing institutional arrangements, legislative procedures, and government orders in implementing road projects, as well as fostering a conducive atmosphere for private participation. Some of the key steps undertaken included⁵⁶

- (i) Rajasthan State Highways Act 2014;
- (ii) Rajasthan State Highway Fee (determination of rates and collection) Rules 2015; and
- (iii) Government orders for
 - (a) Adoption of Model Documents published by the Planning Commission,
 - (b) Constitution of the Empowered Committee for Road Projects,
 - (c) Constitution of the Bid Evaluation Committee,
 - (d) Constitution of the Approval Committee for RFP bids of Consultants and RFQ application with respect to Road Projects, and
 - (e) Constitution of the Bid Approval Committee for Road projects.

⁵⁵ Government of India. National Highways Authority of India; investor reports, credit ratings and author analysis.

⁵⁶ M. Maheswari, A. Kulshreshtha, and K. Bharadwaj. 2019. Technical Paper on Rajasthan State Highways Development on PPP mode. *Indian Highways*. 7 (8). pp. 16–20.

After conducting a feasibility study of approximately 8,910 km for development in FY2015, the state government conducted several workshops and stakeholder consultations which were attended by road developers, financing institutions, bank representatives, and consultants. Based on the feedback received, changes were made to the standard bidding documents to attract the private sector. Owing to the lack of interest in PPP-Toll projects, it was decided that some of the projects would be implemented on a PPP (HAM) basis. ADB is participating in five contracts in the Rajasthan State Highway Investment Program which were at different stages of implementation as of 2021 (Appendix 14). The share of private sector financing and government funding is 50:50, and the O&M period is 10 years.

ADB is supporting a \$904 million PPP project in Madhya Pradesh in alignment with the state government long-term road strategy. The project is aimed at improving the transport connectivity in the state by rehabilitating and upgrading about 1,600 km of newly declared state highways and single-lane district roads to two-lane widths. In addition to the ADB contribution of \$490 million, the government is expected to contribute \$128 million, and the private sector is expected to contribute \$286 million. The project commenced in December 2019 and is expected to be completed within 4.5 years.

The project in Madhya Pradesh is being supported through a sector lending modality, considering that:

- (i) The project is expected to finance small subprojects including state highways and major district roads throughout the state.
- (ii) Madhya Pradesh has a sector development plan in place.
- (iii) The Madhya Pradesh Road Development Corporation has the requisite institutional capacity to implement sector plans and implement road packages.
- (iv) The Madhya Pradesh Road Development Corporation has prior experience in the procurement of concessionaires and the execution of ADB loans.

The project structure would be different from NHAI, Rajasthan, or Karnataka HAM projects. Approximately 60% of the project cost is estimated to be funded by the authority with the remaining to be arranged by way of debt and equity by the concessionaire.⁵⁷ Eleven contracts had been awarded as of 2021 and all the projects are in various stages of construction. The remaining 13 contracts are under various stages of procurement as of 2021.⁵⁸ The operations period is 10 years (Appendix 14).

The Karnataka State Highways Improvement III Project has HAM-based contracts to improve about 418 km of state highways. ADB is providing financing assistance of \$346 million, and the private sector is investing an estimated \$148 million.⁵⁹ All three construction packages are at the implementation stage (as of December 2021). Approximately 75% of the project cost is estimated to be funded by the authority with the remainder to be arranged by way of debt and equity by the concessionaire. The operations period is 7 years.

⁵⁷ Government of India, Press Information Bureau. 2019. *ADB, India Sign \$ 490 Million Loan for PPP to Upgrade Madhya Pradesh Roads*. 20 December.

⁵⁸ Government of India, Madhya Pradesh Road Development Corporation. 2021. *Status Report*.

⁵⁹ ADB. India: Karnataka State Highways Improvement III Project.

E. Experiences in the Water Sector

HAM has been adopted in sanitation projects by the Government of India National Mission for Clean Ganga (NMCG) in collaboration with state urban local bodies. To attract developers to invest in the initiative, NMCG has adopted innovative programs such as “One city One operator.” These programs have attracted investors and the private capital mobilized as of September 2020 amount to \$102 million.⁶⁰

The NMCG has also been supported by the International Bank for Reconstruction and Development (IBRD) Loan Guarantee mechanism. Safeguards have been provided to the concessionaire in the event of any payment defaults from the authority side. IBRD offers guarantees to the special purpose vehicle in case of any default and engages with the Government of India and/or NMCG to address the funding gap.

Unlike the national highway projects wherein the authority (NHAI) is an established organization with a well-developed and coordinated organizational system, projects introduced by NMCG are relatively new.

Issues of discrepancies in the preparation of detailed project reports have been highlighted leading to changes in scope and increased project costs causing project delays.

Unlike road projects, land acquisition issues have not led to inordinate delays in project initiation. In cases where land issues have been found, the work scope has been modified to resolve issues and complete projects.

Design issues on the projects have been observed leading to substantial project delays. This has led to bidders conducting their due diligence while bidding for projects, which may lead to asymmetric information and resultant uncompetitive bids.

Like road projects, front-loading of capital expenditure has been observed in certain bids. However, HAM sanitation projects have been received favorably by lenders.

Instances of non-achievement of conditions precedent due to delays in financial closure are rare. This may primarily be due to the payment safety mechanism embedded in the concession agreements by NMCG along with the introduction of the IBRD payment guarantee.

To enhance bankability and replicability of its HAM projects, the water sector may benefit by adopting an organizational setup like that of NHAI wherein the operations are monitored by project implementation units at the site, city, or town. The project implementation units may be monitored by a regional office, which is in turn monitored by the head office.

⁶⁰ Government of India, NMCG. 2020. Namami Gange Bankers Powerpoint Slide on HAM status. (In this document the ₹ has been converted at an approximate exchange rate of \$1 = ₹70).

IV. LEARNINGS FROM EXPERIENCES

A. Introduction

The introduction of any new model of implementation brings procurement and implementation challenges to all stakeholders in the ecosystem, including implementing agencies, concessionaires, and banks and/or finance institutions. HAM implementation is no different. Initial exuberance gave way to cautious implementation as several concessionaires found it difficult to achieve financial closure of their awarded projects. To delve deeper, semi-structured interviews were conducted with representatives of implementing agencies, banks, finance institutions, and concessionaires. Opinions were sought from them on the key issues affecting the stakeholders in the entire process. In addition, probable solutions—either by way of effective coordination or contractual amendments—were elicited.

B. Key Learnings from Implementation of the Hybrid Annuity Model

Issues identified and discussed with various categories of stakeholders have been detailed out in this section as per phases of the project life-cycle.

1. *Issues Faced during Project Planning and the Procurement Phase*

Project readiness for land acquisition. Timely land acquisition is one of the biggest impediments to the smooth implementation of infrastructure projects in India. A structured handover process is stipulated in the HAM concession agreement. The process for the acquisition of land follows the provisions of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013. It establishes set procedures for the acquisition of land for infrastructure assets.⁶¹ Even after following the procedures, some instances have resulted in litigation and delayed availability of land for road projects. To decrease the time for acquisition and reduce litigations, various states have commenced activities for the bulk acquisition or purchase of land through the consent of landowners. Successful examples of direct transfer have been observed in Karnataka, Maharashtra, Odisha, and Uttar Pradesh.⁶²

Further, it is observed that the concessionaire does not necessarily commence work on the entire project alignment simultaneously. If a specific land parcel cannot be made available by the appointed date, such land parcel handover schedule may be aligned with the program to minimize any impact of delay in land handover on the project progress.

Bidding process. Agencies highlighted that they have a strong pipeline of infrastructure projects, and it is necessary to encourage various types of developers to participate in the process. Large companies are constrained for participation in new projects due to the backlog of existing contracts.

Considering that contract sizes of state projects are relatively smaller than those of national highway projects and that the requirements of equity and debt have also been lowered, smaller projects are likely to attract small- and medium-sized qualified companies and help change the market dynamics.

⁶¹ Notification issued by the Government of India Ministry of Road Transport and Highways issued on 28 December 2017 on *Land acquisition under the National Highways Act, 2956*, including comprehensive guidelines.

⁶² Government of India, Maharashtra State Road Development Corporation Ltd announcement (accessed 2 September 2021); Karnataka State Highway Network Announcement of ADB technical assistance (accessed 2 September 2021); Bhahadrak Land Acquisition Section Project Page (accessed 2 September 2021); Greater Noida Development Authority notice of land acquisition (accessed 2 September 2021).

Review and reform of the technical and financial qualification requirements and slicing of package sizes are likely to help smaller companies qualify for projects and reduce dependence on large developers for the execution of projects. Revised technical requirements on widening the definition of the infrastructure sector to include other subsectors, reduction in the threshold of the capital costs of the eligible assignments, and the elimination of experience in tunnel and bridge projects are likely to attract greater participation from the private sector. A reduction in the threshold of the required net worth of prospective bidders from 25% to 15% of the project cost is likely to help (i) allow greater participation from small and medium-sized companies, and (ii) increase the bidding capacity of the large-sized contractors. With National Infrastructure Pipeline projects being implemented, supply-side issues must not be encountered.

Lowering the private sector financing proportion from 60% would be another option to help increase the market size and appetite. In the Karnataka State Highways Improvement III Project, the private sector is required to finance only 25% of the project cost. The HAM requirements of the private sector were 50% in the Rajasthan project, and 40% in the Madhya Pradesh project.

Mobilization advance as an interest-free loans. While the recalibration by MORTH of the interest rate payable by the concessionaire on mobilization advance is a welcome move, there is scope to do more in this direction. As practiced internationally in construction contracts, an interest-free mobilization advance could reduce the financial risk of the concessionaire, which may attract more competitive bid prices.

Constitution of a dispute resolution board from the list maintained by independent dispute resolution forums. Amendment of the concession agreement requiring constitution of a DRB—whose decision would be binding on the parties—is expected to help resolve construction disputes promptly. Given the requirement to use the list of potential DRB members maintained by the authority, there is an opportunity to enhance the confidence of the private sector in the resolution system by mandating to select members of the boards from the list maintained by reputed independent dispute resolution forums.

Presence of two variables in the bidding process. Bidding for HAM projects involves a complex interplay of bidding variables. In many projects, it has been observed that the O&M cost quoted is at a variance (mostly negative) from the actual costs to be incurred by the concessionaire.

While conducting the loan appraisal for lending, banks and finance institutions typically get the values vetted by a third-party engineer and incorporate them into their financial analysis. In doing this, lenders are likely to consider the wider issue of whether the consolidated cash flows of the concessionaire can sustain the debt and operational expenses, instead of focusing on the magnitude of the individual bidding variables.

Implementing agencies take the view that the mechanism of the O&M bid variable should not be a single variable inflated by a multiple, but should mimic the actual expenses likely to be incurred by the concessionaire during the operation and maintenance of the assets. Projects incur minimal O&M expenses in the initial years of operation, which keep increasing as the asset ages. The implementing agencies recommend that the O&M variable be pegged to a ballooning structure (like the annuity payment mirroring the principal payment of a debt product taken for financing the project), which mimics relative O&M costs to be incurred by the project.

Another view expressed by lenders was the availability of a reference maintenance cost, which could be made available by the authority as a guidance rate. While maintenance costs would depend on the quality of assets created for which the designer would be able to make the best estimate, availability

of a range of annual reference maintenance costs for similar assets—based on recent case studies—could help lenders and project participants to assess the estimated project O&M costs while assessing financial feasibility and bid pricing of the project.

Requirements of funding arrangements by the authority. Unlike under FIDIC contract forms, the authority has no obligation to provide evidence of its financial arrangements to the concessionaire in a HAM contract. While bidding for a HAM project, firms are likely to rely on the credit rating and credit history of the authority. Primary consultations reveal that all classes of concessionaires who are technically and financially qualified are more inclined to bid for NHAI projects than for state-implemented highway projects. The same sentiments are echoed by banks and financial institutions in their approach to lending. One of the primary reasons is the creditworthiness of NHAI, which is rated AAA (the highest domestic credit rating available). Discussions with concessionaires and bankers revealed that the payment history of NHAI is excellent with very rare delays. The same is not reflected when project participants evaluate the creditworthiness of state government road-implementing agencies. State road agencies depend on state government budgets for yearly annuity allocations, and the fiscal deficit of state governments and credit ratings do not help instill confidence in the participants. Many stakeholders revealed that the participation of multilateral agencies in financing state road programs provides confidence to project investors. Examples include HAM projects in Karnataka and Rajasthan financed by ADB, and a project in Tamil Nadu financed by the World Bank.

Stakeholder consultations suggested that limited visibility of annuity and/or gap funding fund allocation within the state budget does not evince confidence among lenders. To mitigate such concerns, the NMCG program financing agency places two installments of construction assistance (during construction) and two installments of annuity payments (during the operations stage) in an escrow account lien marked to pay to the concessionaire. As additional security, IBRD payment guarantees were provided to backstop authority payment obligations in certain projects. Although the implementing agency incurs a cost of carrying, it benefits by attracting better quality companies that would be interested in executing the project.⁶³

To enhance the creditworthiness of annuity projects launched by state government agencies or in sectors other than roads, banks and/or financial institutions have proposed a line of credit from a bank or revolving fund mechanism, guaranteeing payment of an annuity to the concessionaire. Such facilities were introduced by NHAI while initiating PPP projects in India.⁶⁴ Such credit enhancement mechanisms are likely to increase confidence among the lending fraternity for advancing funds in HAM projects, and drawing interest from a wider pool of developers.

Introduction of HAM projects in sectors employing assets that have a long asset life. Many banks and finance institutions were of the opinion that HAM can be employed in sectors such as railways, port operations, and warehousing, where the asset life is longer than the concession period. Utilizing private sector efficiency can help unlock value in these sectors. The Ministry of Railways has already identified BOT-Annuity as a preferred mode of implementation for encouraging private sector investment.⁶⁵

⁶³ After reaching the construction milestone, the concessionaire normally submits its utilization certificate for release of funds by the implementing agency. The implementing agency then submits its drawdown request to the World Bank and releases it to the concessionaire. Interest is levied once the drawdown occurs. The drawdown funds for NMCG occur prior to its utilization as it is kept in an escrow account to demonstrate availability of funds. Owing to early drawdown, NMCG pays higher interest costs on the outstanding loan.

⁶⁴ Government of India, Department of Economic Affairs. 2010. *Public Private Partnership Projects in India: Compendium of Case Studies*. New Delhi. https://www.pppinindia.gov.in/toolkit/pdf/case_studies.pdf.

⁶⁵ Government of India, Ministry of Railways. 2014. Sectoral guidelines for Domestic/Foreign Direct investment in Railways. 20 November.

Requirements to change the contracting template with General Conditions of Contract and Special Conditions of Contract. The format of contract documents comprises a mono-layer structure that does not separate conditions that are generally applicable to any project from the conditions and data that are populated, adjusted, or included to address project-specific requirements. The result is that project-specific data get buried in the document, and contract templates do not provide the flexibility to accommodate project-specific requirements such as changes in conditions precedent, performance security obligations, termination payments, or dispute resolution. In the absence of guidance on the fundamental aspects that must be retained to ensure delivery of the intended purpose of the contract model, there is a risk that while drafting the bidding document, arbitrary changes in the main document may be introduced, making it difficult to trace them in the standard wordings, and exposing the document to the risks of diluting the fundamental characteristics of the model and of creating ambiguity in the document. The FIDIC Suite of Contracts 2017⁶⁶ follows five golden principles,⁶⁷ including the balance of risk–reward allocation and dispute resolution mechanism; and a three-layer structure: general conditions for standard wordings, particular conditions for contract data, and particular conditions for special provisions. Similar structures are also typically followed in multilateral development-funded contracts.

Investment has increased and will likely grow further due to the National Infrastructure Pipeline. There is an opportunity to attract global investors, particularly in very large and complex projects. While existing hybrid annuity contracts do not restrict the participation of the international market, the alignment of contracts with global standards adopted by FIDIC and multilateral agencies would help instill global investor confidence.

2. *Issues Faced during the Construction Phase*

Enhancement of the independent engineer role for execution. The role and responsibility of the independent engineer must be enhanced for greater due diligence and more efficient contract administration.⁶⁸ Under FIDIC contract forms, one of the fundamental roles played by the engineer is to make determinations on claims—such as extensions of completion time, additional payments, extensions of defect notification periods—without requiring employer’s prior approval. Parties are required to follow the determination of the engineer unless and until revised by higher forums of dispute resolution. During consultations, implementation agencies mentioned that monthly reports and progress meetings need to be convened, and outstanding issues, correspondence, and responses need to be detailed in reports. Concessionaires and banks suggested that periodic consultations be convened among project stakeholders to provide updates and discuss outstanding issues.

Since lenders are not provided access to the independent engineer’s reports periodically and officially, they have to rely on their own engineer’s reports for monitoring progress. Systemic access to the authority’s and independent engineer’s reports would help in updating information and help them understand any variance in reporting.

Early completion incentive may need enhancement to realize the objective of this mechanism. The bonus payment provision for early completion entitles payment of 0.5% of 60% of the BPC if the project is completed 30 days before the scheduled completion date. After this, payment would be calculated on a pro-rata basis for each day preceding the first 30 days.

⁶⁶ Footnote 27, para. 85.

⁶⁷ FIDIC. FIDIC Golden Principles (2019). Geneva.

⁶⁸ The independent engineer is the monitoring authority appointed by the authority in accordance with Article 21 and Schedule M of the concession agreement in PPP HAM projects.

This provision does incentivize concessionaires to mobilize early and work expeditiously to maximize productivity. Early completion may necessitate taking acceleration measures, which would result in additional costs to the concessionaire on two accounts. First—to increase the rate of production—the concessionaire would require additional resources. This would require borrowing additional working capital, typically at a prevailing interest rate of 8%–9% per year. Second, labor crowding may lead to a loss of productivity, increasing costs of production which might make early completion unattractive to the concessionaire. One HAM project had a 24-month construction period with a 1% project completion cost per month for early completion. The concessionaire completed the project more than 12 months earlier than scheduled. Early completion and project operation bring additional economic benefit, so reward sharing may be amplified to incentivize the concessionaire. To avoid potential disputes, it is important to provide clarity on the mechanism of incentive sharing. When the concessionaire cannot achieve an early completion target due to an authority risk event, for example, there could be handover delays for part of the site.

Increase in frequency of progress payment during construction. Amendments to HAM contracts permitting milestone-based progress payments in 10 installments from the originally applied five installments is a welcome move for the private sector. This change helps improve project cash flow during construction and provides bidders with the opportunity to reflect this in their bid price. All project stakeholders agree that such a mechanism fosters confidence and increases the pace of implementation.

There is scope to provide further flexibility in this direction. This could be done by following international construction industry best practices of linking a monthly payment schedule to the achievement of specific progress milestones.

Some implementing agencies state that payment frequency should be made monthly and that 75% of the gross amount should be released to the concessionaire before detailed scrutiny by the independent engineer. This suggestion is in line with the prevailing monthly payment practice in the railway sector in India, where authorities typically pay 80% of the provisionally certified amount, after preliminary scrutiny and the issuance of a provisional interim payment certificate by the engineer, within 7 days of the date of certification.

The escrow mechanism needs to be strengthened and contours extended to all project parties. The escrow mechanism is a tripartite arrangement among the implementing agency, concessionaire, and lenders. Funds released are verified per expenses incurred by the concessionaire then released for reimbursement. Although the concession agreement permits audit of concessionaire project accounts, it does not allow the implementing agency to audit or review the fund flow or whether the concessionaire has utilized it for project purposes. The risk of fund diversion increases when the implementation contractor (in the capacity of concessionaire subcontractor) is a stakeholder of the concessionaire. Implementing agencies recommend that the implementation contractor is required to have project-specific accounts under the concession agreement so that they may be audited.

Banks and finance institutions have also suggested the appointment of two separate teams—under the same entity—for technical and financial progress monitoring of the project. This would be a project monitoring team to monitor physical progress and a financial controller for monitoring financial progress. All escrow transactions—along with their end use—would be reviewed by the financial controller, who would report any divergence. This would enable better governance and prevent any diversion of funds.

Communication protocol needs to be updated for better governance. Stakeholder consultations revealed differing options on communication protocols detailed in the agreement. While the concessionaires and the implementing agencies considered the existing system adequate, lenders

believed the communication protocol and information dissemination should involve them as well. Access to real-time updated information in the form of progress reports should be made available to lenders. Implementing agencies such as NHAI maintain a database containing updated independent engineer project reports. Project-specific access to such a database system would benefit lenders as they would gain real-time access to information about the status of projects funded.

3. *Issues Faced during the Operations Stage*

Reduction of lock-in period for change in ownership promotes recycling of assets. Concessionaires and lenders have welcomed the clause modification on the reduction in the ownership lock-in period. Contractors need to recycle their equity as their strength lies in asset construction. Once constructed, assets can be sold to recycle equity for investing in projects being bid on or under construction. Lenders can correct their asset–liability mismatch owing to the churning of assets. Assets are usually handed over to other “long-term patient capital investors” whose liabilities match with the tenure of the assets.

Termination payments are linked to the liabilities; requirement to link it to the asset side. The structure of the concession agreement links the termination payment to liabilities (debt due and adjusted equity). The contract ties down the definition to the total project cost so that compensation computed is usually lower than actual costs incurred by the concessionaire in constructing the project. Lenders preferred to modify the basis for computation of termination payment. Post termination, assets are transferred to the implementing agency, which is why compensation should be linked to the value of the assets created rather than the means of finance.

C. Identification of Drivers of the Hybrid Annuity Model

There are a few important drivers in sectors where HAM is being used that are essential in applying HAM to other sectors. Before the formulation of the contracting format, it is important to understand the enabling ecosystem, maturity of the sector, and capability and receptivity of sector participants to HAM. Sector-specific intricacies need to be considered for determining the applicability of HAM. The primary factors identified are:

- (i) **Legal and contractual frameworks.** The presence of PPP legal frameworks covering sector-specific policy, tariff determination instruments, standard procurement documents, model concession agreements having equitable risk–reward allocation, payment frequencies to reduce concessionaire working capital requirements, and functional dispute resolution mechanisms are essential to instilling confidence to private sector entities for participation. Several subsectors within infrastructure—such as roads, airports, power, and water—have seen such initiatives being undertaken in India to enhance private sector participation.
- (ii) **Institutional capacity and capability of public authorities.** Establishment of empowered and dedicated PPP procurement entities—such as the creation of PPP cells, appointment of capable and committed personnel to undertake PPP initiatives, and capacity-building activities to imbibe best practices for project selection, procurement, value for money exercises and post-award contract management—help in creating a differentiator to attract private sector participation.
- (iii) **Fiscal state of the implementing agency.** The ability of the implementing agency to make timely payments to the concessionaire—during the construction and operation periods—is a key to attracting private sector financing. The fiscal situation of the state and the credit rating of the financing agency are critical factors for consideration.
- (iv) **Good governance.** A good governance system, accountability, capability to make prompt decisions, transparent and fair PPP procurement processes, and effective stakeholder consultation are important elements for the successful implementation of HAM projects.

- (v) **Capable market investors.** It is important that the existing ecosystem of construction companies, implementing agencies, technical consultants, credit rating agencies, investors, and insurance companies is robust and can support the takeoff and growth of HAM implementation.
- (vi) **Stable capital market.** The presence of a deep secondary market consisting of “patient capital” investors such as pension funds, infrastructure funds, and long-term investors is essential for the feasibility and growth of HAM. Infrastructure projects are long-term gestation projects funded by a mixture of debt (from banks and finance institutions) and equity (infused by project sponsors). An asset–liability mismatch should be minimized between the tenor of the loan taken by the concessionaire and the deposits aggregated by banks and finance institutions for providing the loan. Systems and mechanisms for facilitating the recycling of debt and equity infused by long-term investors who do not have an “asset–liability mismatch” are deemed essential.
- (vii) **Technological complexity and space for innovation and efficiency.** Technological complexity where benefits accrue due to private sector efficiency is critical. PPP is likely to require a higher cost of capital, which should be compensated by design innovation and implementation efficiency brought in by the private sector. Sectors such as water and sanitation and railways are likely to see the advent of HAM project implementation. Sectors such as canal lining and lifting irrigation do not employ technological complexity and are less likely to bring additional benefits by using HAM.
- (viii) **Operational life of the assets.** The operational life of the asset created in the project must be more than the concession period being considered. This is relevant to asset-intensive sectors including roads and railways, water supply and sewage treatment, and energy generation and transmission. Replacement of specific part assets during the concession period will be necessary, and clarity of such requirements in the contract would help lenders assess bankability and the concessionaire to price the project accordingly.
- (ix) **Project bankability.** Projects need to be bankable to attract private sector participation. Concessionaires utilize a mix of debt and equity when financing projects. Banks require clarity on assets for security classification, clarity on payment mechanisms, termination payments, force majeure, and provisions for concessionaire substitution in case of financial default. The concession construct of PPP HAM contracts should include provisions that are amenable to banks and financial institution requirements.
- (x) **Project readiness.** The level of project readiness at the outset in terms of availability of the site and regulatory approvals is critical for success. The issue of land acquisition is higher in linear projects (such as roads, railways, canals) than in cluster projects (such as water treatment plants, sewage treatment, ports).

D. Assessing the Suitability of the Hybrid Annuity Model for Other Sectors and Countries

Consideration to adopt the HAM contractual model in a new sector and country requires a two-step strategy. Firstly, an assessment needs to be done on its feasibility, suitability, and acceptability and for the ease at which it could be adopted within the country. Once considered, an analysis of sector requirements and their ability to complement contractual peculiarities needs to be done.

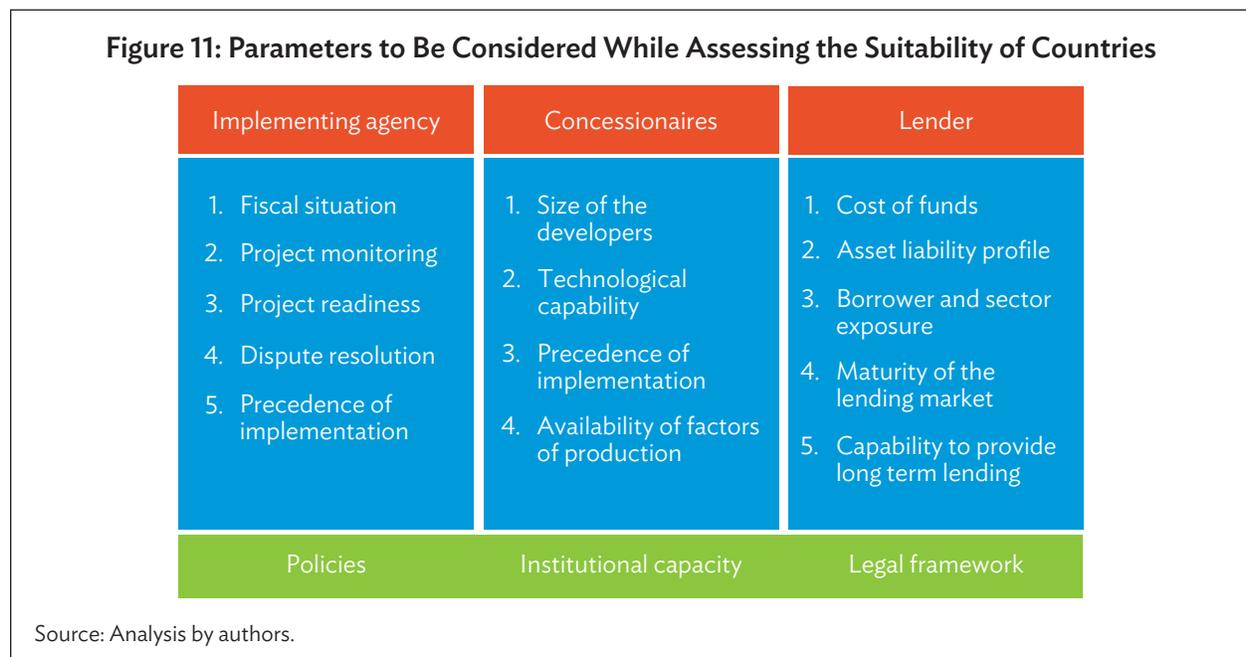
1. Country Suitability

The PPP framework in India has been developed based on the interplay of policy, legal frameworks, institutional capacity, processes, and other arrangements. Legal requirements for infrastructure laws and acts have been enacted in various states of the country to support PPP. Earlier modes of PPP—such as BOT-Toll and BOT-Annuity—have undergone improvements over the years through the formulation of standardized bid documents and model concession agreements. These standardized documents have

been improved over the years through regular and transparent stakeholder consultations. The authority has employed measured clearance and approval processes during the pre-construction stage. Various measures—such as viability gap funding—have been introduced by both state and central government to aid PPP projects financially.

The adoption of PPP differs between countries. In countries where public funds are abundant and public infrastructure and institutions are strong, PPP is seen to have played a minimal role in infrastructure development (such as Brunei Darussalam and Singapore). In countries where public finances are scarce, banks and financial institutions are capable and willing to provide long-term financing and the domestic construction industry is relatively mature. PPP has been used as an important vehicle for infrastructure creation in countries such as India, the Philippines, and Thailand.⁶⁹ Determining the suitability of HAM for country-specific requirements entails a complex interplay of “ability” and “willingness” of the authority to implement this model of contracting, as well as the “requirement” for a conducive ecosystem. “Ability” would be dependent on the fiscal position of the country and the implementing agency, gains derived from the execution of previous PPP projects, and the presence of a strong “supply” of developers able to bring in private sector efficiency. “Willingness” would depend on the presence of essential legal frameworks, public infrastructure and institutions, perception of HAM, maturity of the sector, and willingness of the developer market to participate in bidding.

Stakeholder consultations revealed that expectations of stakeholders in the ecosystem need to be managed if the proposed model is to be implemented successfully in a country. Figure 11 summarizes the parameters to be considered while assessing the suitability of countries. Essential policies, legal frameworks, and institutional capacity form the bedrock of three essential pillars: (i) the implementing agency, (ii) the concessionaire, and (iii) the lender.



⁶⁹ F. Zen. 2018. Public-private partnership development in Southeast Asia. *ADB Economics Working Paper Series*. No. 553. Manila. Asian Development Bank.

2. Sector Suitability

Once the applicability of HAM implementation is evaluated in a country context, it needs to be determined whether the contractual features align with the requirements of the sector. Before evaluating the benefits of HAM, it is crucial to assess whether the involvement of the private sector in it would be able to accrue efficiency in construction as well as operations. Sector-specific inputs would include

- (i) **Sector maturity.** The maturity of a sector in a country is an important factor for assessment. Sector maturity implicitly means technological capability and risk-bearing capacity present within the developers operating in the sector. Value accretion in PPPs stems from efficiencies brought in design, construction and operation, and technological maturity.
- (ii) **Nature of assets.** Returns on an infrastructure asset are dependent on where the operator can use the asset for a considerable time to make returns on the investment. Infrastructure projects have long gestation projects. The life of an asset should be commensurate with the period during which the asset is being operated. If the asset replacement period is shorter than the concession period, it adds an element of risk for lenders. Specific requirements for the O&M period should be considered carefully so that lenders can reasonably assess the bankability of a project by considering the nature and life span of the asset.
- (iii) **Expense profile and investment proportion during construction.** The expense profile of infrastructure projects—primarily in roads, ports, and railways—includes a high up-front cost to be expensed within the construction period and relatively low operations costs during the maintenance period. Depending on the market capability and appetite, a higher proportion of project construction cost funding by the authority during the construction period would reduce the requirement of funds to be tied up by the concessionaire thereby improving the acceptability of HAM. If the requirement of funds is less—and the market is capable and has a high risk appetite—then a larger proportion of funding by the authority during construction may not be required for making the project viable.

V. CONCLUSION AND RECOMMENDATIONS

This study—which is based on a combination of desk research on PPP programs, stakeholder consultations with implementing agencies, concessionaires, and banks and finance institutions—has examined the basic features of HAM and how they compare with other contract models. The study explored practices, opportunities, and challenges in each phase of a project life-cycle, highlights potential areas of improvement to enhance acceptability, and identifies 10 basic drivers of HAM that need to be considered while determining its applicability in a sector or country implementing infrastructure projects.

Suggestions for enhancing the adoption of HAM across various sectors and countries throughout the project life-cycle are as follows:

- (i) **Project Design and Procurement**
 - (a) **Use model concession agreements as a template and modify as per the requirements of a project; bifurcate the general and specific conditions of the contract to customize them as a project requires.** Modification of the model concession agreement to incorporate sector-specific requirements is essential. It is also to be noted that that projects within a single sector may also require customization for terrain, operational complexity, conditions

precedent, land requirements, etc. The format can be modified into a format like that followed by FIDIC, where the content is bifurcated into general conditions of contract and specific conditions of contract. This would enable easy incorporation of project-related peculiarities within the contract structure.

- (b) **The fiscal health of the financing and/or implementation agency needs to instill developer confidence; credit enhancement measures need to be built to enhance investor confidence.** Fiscal health of the implementing agency is taken into consideration by developers as well as lenders evaluating the bankability of projects. For example, developers consider NHA1 projects to be safe (it is an AAA-rated entity) and therefore participate in them. The same is not reflected in the credit profile of state implementation agencies. As a result, they employ various credit enhancement mechanisms in the form of revolving funds, lines of credit, and guarantees from multilateral agencies to be built in the contract. A market-sounding exercise before project procurement needs to be done to understand the aspirations of project stakeholders, and suitable project structuring and credit enhancement mechanisms need to be incorporated to instill confidence.
- (c) **HAM can be considered in long-tenure asset sectors; the residual value of assets provides security value to lenders.** Long gestation infrastructure projects provide an asset-backed cash flow that is securitized by lenders. The residual value of assets provides security cover to lenders. The life of the asset forms guidance for the selection of HAM and determines its concession period.
- (d) **Sector-specific constructs need to be built into the contract based on sector parameters.**
 1. Quantum of mobilization advance. Some sectors might be capital-equipment-intensive at the commencement of construction, whereas some sectors may require capital equipment at specific milestones within the construction period.
 2. Frequency and quantum of construction grants. Frequency and quantum of construction grants would depend on investor profiles.
 3. Frequency of annuity payments.
 4. Payment profile of operation and maintenance provisions.
 5. Bifurcation of performance guarantee into construction and operations period.
 6. Bifurcation and allocation of damages detailing its cause.

(ii) Project Construction

- (a) **Incentives need to be reconstructed to incentivize developers for early completion.** Provisions in the contract structure may not be attractive enough to incentivize the concessionaire to speed up its construction process and increase its working capital requirement. Financial compensation needs to be devised so that a certain portion of the economic benefit accruing to the authority is passed on as a financial benefit to the concessionaire.
- (b) **Communication protocols need to be strengthened to ensure transparency of information among project stakeholders.** Material issues reported by the independent engineer do not necessarily get reported to all project stakeholders. Lenders need to resort to informal discussions with the independent engineer to gain access to information. Systemic access needs to be provided to all project stakeholders to ensure transparency of information flow.
- (c) **Escrow mechanism needs to be strengthened to enhance investor confidence.** The agreement allows control on the movement of funds within the scope of the concessionaire. A diversion of funds—especially mobilization advances—occurs in the account of the implementation contractor (concessionaire’s subcontractor), which typically is a partner of the HAM concessionaire. Additional audits of project-specific accounts of the

implementation contractor could be allowed under the provisions of the HAM concession agreement. The appointment of two separate teams for conducting general supervision and controlling the flow of funds in the escrow account is also likely to ensure transparency and enhance investor confidence.

(iii) **Project Operations**

Termination payments are linked to liabilities; requirement to link it to the asset side.

Termination payments are linked to liabilities used in financing the asset (debt and equity). Interpretation of debt and equity in the agreement does not cover the actual project cost incurred, leaving lenders to depend on shortfall undertakings from the concessionaire. The basis on which termination payment is calculated should be changed. Transforming the basis to a book value asset will enable assessment of the value created to base optimal compensation on it.

(iv) **Suitability of Sector and Country**

Political willingness, financial strength, and suitability of bidders are important parameters to be considered for HAM to be successful. HAM is expected to be more successful for sectors that have a longer useful life. Stakeholder consultations reveal that projects requiring a frequent overhaul of equipment will be less suitable for HAM. Sector-specific standardized documents—such as model concession agreements and bidding models—will also aid such PPP models.

APPENDIXES

APPENDIX 1: TERMINATION CLAUSES

(Abstracts from Article 31 of *Model Concession Agreement for Hybrid Annuity Project*, MORTH, November 2020).

Table A1.1: Termination Provisions

Major Concessionaire Defaults Leading to Termination
1. Failure of the concessionaire to replenish fresh performance security after appropriation by the authority for damages
2. Upon replenishment of performance security, the concessionaire is unable to fulfill conditions precedent or cure deficiencies within 120 days
3. Failure of the concessionaire to meet project milestones as per Schedule G and continuous default of 120 days
4. Intention of the concessionaire to abandon construction or operation of the project without the prior written consent of the authority
5. Commercial operation date does not occur within the specified period
6. Non-closure of punch list items within the specified period
7. Breach of maintenance and safety requirements by the concessionaire
8. Failure to make payments to the authority within the specified time
9. Failure to cure escrow default within 15 days
10. Financial default that requires the lender to undertake termination or suspension and concessionaire is unable to cure default during the cure notice period of suspension
11. Breach of project agreements by concessionaire leading to material adverse effect
12. Change in ownership without the approval of the authority
13. Concessionaire becoming bankrupt or insolvent
14. Any submission or warranty submitted by the concessionaire being found false
15. Concessionaire commits a default which has a material adverse impact on the authority

Source: Government of India, Ministry of Road Transport and Highways (MORTH). 2020. *Model Concession Agreement for Hybrid Annuity Projects*. Delhi.

Termination Payment for Concessionaire Default

- (i) **Termination during operation period.** Upon termination due to concessionaire default during the operation period, the authority is required to pay 65% of the sum of unpaid annuities including interest up to the transfer date.
- (ii) **Termination during construction period.** Upon termination due to concessionaire default during the construction period, the termination payment is made based on the payment milestone achieved in the physical progress made by the concessionaire in the project (Table A1.2).

Table A1.2: Termination Payment for Concessionaire Default (Construction Period)

Payment Milestone	Basis of Calculation for Termination Payment
I	Nil
II	Nil
III	50% debt due or 3.00% of bid project cost (BPC) whichever is lower
IV	55% debt due or 5.78% of BPC whichever is lower
V	60% debt due or 9.00% of BPC whichever is lower
VI	65% debt due or 12.68% of BPC whichever is lower
VII	70% debt due or 16.80% of BPC whichever is lower
VIII	75% debt due or 21.38% of BPC whichever is lower
IX	80% debt due or 26.40% of BPC whichever is lower
X	85% debt due or 31.88% of BPC whichever is lower

Source: Government of India, Ministry of Road Transport and Highways. 2020. Model Concession Agreement for Hybrid Annuity Projects. Delhi.

If the termination occurs between payment milestones, only the milestone achieved would be considered in calculating the termination payment.

Termination Payment for Authority Default

Termination payment is debt due less insurance cover (Table A1.3) plus 150% of the adjusted equity.

Table A1.3: Termination Payment for Authority Default

Payment Milestone	Basis of Calculation for Termination Payment
I	debt due or 0.75% of bid project cost (BPC) whichever is lower
II	debt due or 1.5% of BPC whichever is lower
III	debt due or 6.0% of BPC whichever is lower
IV	debt due or 10.5% of BPC whichever is lower
V	debt due or 15.0% of BPC whichever is lower
VI	debt due or 19.5% of BPC whichever is lower
VII	debt due or 24.0% of BPC whichever is lower
VIII	debt due or 28.5% of BPC whichever is lower
IX	debt due or 33.0% of BPC whichever is lower
X	debt due or 37.5% BPC whichever is lower

Source: Government of India, Ministry of Road Transport and Highways. 2020. Model Concession Agreement for Hybrid Annuity Projects. Delhi.

Debt due is defined as the aggregate of the following sums outstanding on transfer date (Table A1.4):

Table A1.4: Definition of Debt Due

Debt Due Calculation
1. Principal amount of the debt provided by senior lenders for financing the total project cost, but excluding any part of the principal that fell due for repayment 2 years before transfer date;
2. All accrued interest, financing fees, and charges payable under the financing agreements with respect to debt in (1) above until the transfer date, but excluding (a) any interest, fees, or charges that fell due 1 year before transfer date; (b) any interest or charges payable under the financing agreements to any senior lender, and (c) any pre-payment charges with accelerated debt repayment except where such charges are due to authority default; and
3. Any sub-ordinated debt included in the financing package and disbursed by lenders.

Source: Government of India, Ministry of Road Transport and Highways. 2020. Model Concession Agreement for Hybrid Annuity Projects. Delhi.

Termination Payment for Authority Default (Operation Period)

If the authority defaults during the operation period, termination payment will be the sum of annuity payments remaining unpaid for including interest thereon up to the transfer period.

APPENDIX 2: MODIFICATIONS IN TECHNICAL AND FINANCIAL QUALIFICATIONS FOR HYBRID ANNUITY MODEL BIDDERS

**Table A2.1: Modification in Technical and Financial Requirements
by the Ministry of Road Transport and Highways**

Original Requirement	Modified Requirement
<p>Financial Capacity</p> <p>The bidder shall have a minimum net worth of 25% of the engineering, procurement, and construction (EPC) at the close of the preceding fiscal year.</p> <p>In the case of a consortium, the combined technical capability and net worth of those members who have and shall continue to have an equity share of at least 26% each in the special purpose vehicle (SPV), should satisfy the above conditions of eligibility; provided that each such member shall, for 2 years from the date of commercial operations of the project, hold equity share capital not less than (i) 26% of the subscribed and paid-up equity of the SPV and (ii) 5% of the total project cost specified in the concession agreement.</p> <p>Provided further that each member of the consortium shall have a minimum net worth of 12.5% of the estimated project cost in the immediately preceding fiscal year.</p>	<p>Financial Capacity</p> <p>The bidder shall have a minimum net worth of 15% of EPC at the close of the preceding fiscal year.</p>
<p>The capital cost of the project should be more than 10% of the amount specified in the estimated project cost.</p>	<p>The capital cost of the project should be more than 5% of the amount specified as the estimated project cost</p>
<p>Technical Capacity</p> <p>Core sector would be deemed to include civil construction cost of power sector, commercial setup (SEZs), airports, industrial parks and estates, logistic park, pipelines, irrigation, water supply.</p>	<p>Technical Capacity</p> <p>Core sector would be deemed to include civil construction cost of power sector, commercial setups (SEZs), airports, industrial estates, logistics park, pipelines, irrigation, water supply, stadiums, hospitals, hotel, smart city, warehouses or silos, oil and gas, and real estate development.</p>
<p>BOT - Technical</p> <p>Core sector would be deemed to include civil construction cost of power sector, commercial setup (SEZs), airports, industrial parks or estates, logistic park, pipelines, irrigation, water supply.</p>	<p>Core sector would be deemed to include civil construction cost of power sector, commercial setups (SEZs), airports, industrial estates, logistics park, pipelines, irrigation, water supply, stadiums, hospitals, hotel, smart city, warehouses or silos, oil and gas, and real estate development.</p>
<p>Tunnel projects</p> <p>Tunnel up to 200 meters as part of normal project.</p> <p>Tunnel is part of the project then, the sole bidder, in case the bidder being a joint venture, any member of joint venture shall necessarily demonstrate additional experience in construction of the last 5 fiscal years preceding the bid due date i.e shall have completed construction of at least one tunnel consisting of single or twin tubes (including tunnels for road, railways, metro rail, irrigation, or hydroelectric projects) having at least 50% of the cross-sectional area and 25% length of the tunnel to be constructed in the project.</p>	<p>No Additional condition. No prior experience required.</p> <p>Tunnel is part of the project then, the sole bidder, in case the bidder being a joint venture, any member of joint venture shall necessarily demonstrate additional experience in construction of the last 5 fiscal years preceding the bid due date, i.e shall have completed construction of at least one tunnel consisting of single or twin tubes (including tunnels for road, railways, metro rail, irrigation, or hydroelectric projects) having at least 50% of the cross-sectional area and 25% length of the tunnel to be constructed in the project.</p>
<p>D Bridge</p> <p>Bridge up to 60 meters length</p> <p>If any Major Bridge, ROB, or flyover is (or are) part of the project then, the sole bidder or in the case the Bidder being a Joint Venture, any member of the Joint Venture shall necessarily demonstrate additional experience in construction of Major Bridge, ROBs, or Flyovers in the last 5 fiscal years preceding the bid due date, i.e., shall have completed at least one similar Major Bridge, ROB, or Flyover having span equal to greater than ** i.e., 50% of the longest span of the structure proposed in the project.</p>	<p>No prior experience is required.</p> <p>No change. Can be considered on the basis of its size and pre-bid queries.</p>

RFQ = request for qualification, ROB = road over bridge, SEZ = special economic zone.

Sources: Government of India, Planning Commission. 2014. Public Private Partnership-Request For Qualification-Model RFQ document; Ministry of Road Transport and Highways circular dated October 15, 2020.

APPENDIX 3: ROAD QUALITY SCORES, NATIONAL INFRASTRUCTURE PIPELINE ROAD PLAN (NATIONAL HIGHWAYS AND EXPRESSWAYS)

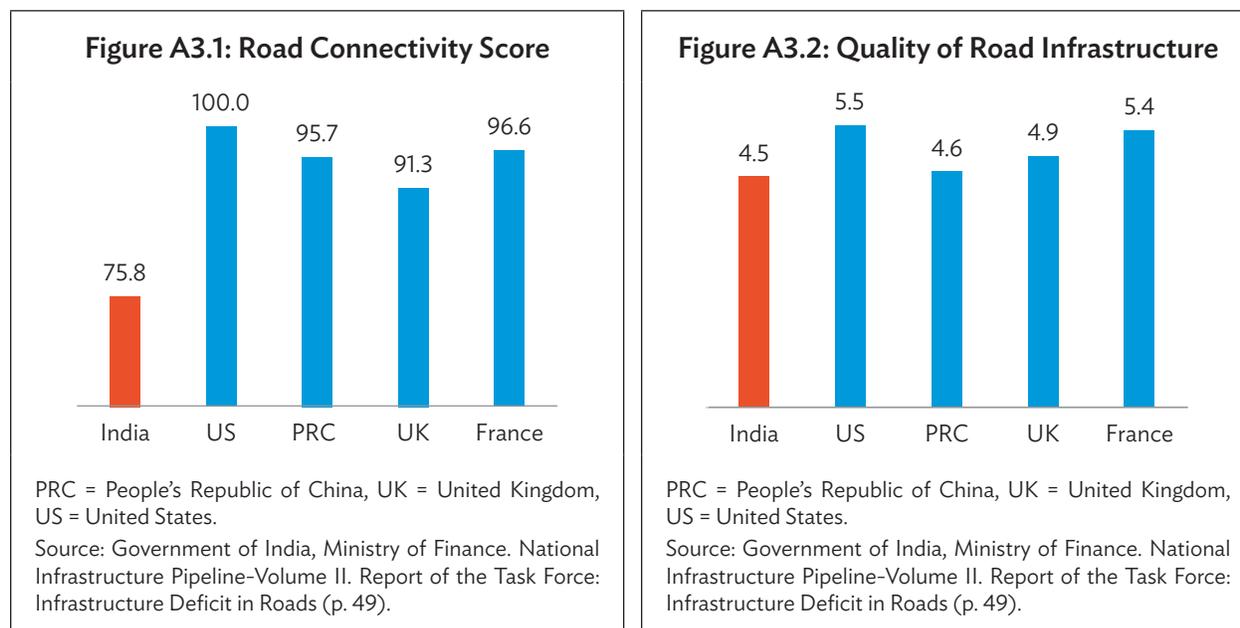


Table A3.1: Breakdown of National Highways and Expressways (Length and CAPEX)

Category	Number of Projects	Length (km)	Capex (\$ billion)
National Highways	1815	87,162	183
Expressways	5	2,142	14.5
Total	1,820	89,304	197.5

CAPEX = capital expenditure, km = kilometer.

Source: Government of India, Department of Economic Affairs, Ministry of Finance. Undated. National Infrastructure Pipeline-Volume II. Report of the Task Force. Infrastructure Deficit in Roads (p. 57).

Table A3.2 indicates the individual contribution of central and state governments to the road sector under the National Infrastructure Pipeline.

Table A3.2: Breakdown of Contribution by Center and States

Contribution by	FY20	FY21	FY22	FY23	FY24	FY25	Total
Center	35	37	36	24.5	24	40	197
States	12	18	15	11.5	10	7.5	93
Total	47	55	51	36	34	47.5	290

FY = fiscal year.

Source: Government of India, Department of Economic Affairs, Ministry of Finance. Undated. National Infrastructure Pipeline-Volume II. Report of the Task Force. Infrastructure Deficit in Roads (p. 57).

Table A3.3: Vision 2025 for the Road Sector

SI	Vision	Desired State
1	Last-mile connectivity	<ul style="list-style-type: none"> Improved access to all remote areas Improved connectivity to key airports, railways, ports, and other locations of strategic importance 60,000 km of highway development: 2,500 km expressways, 9,000 km economic corridors, 2,000 km of port and coastal connectivity Reduce road fatalities by 25%
2	Financing	<ul style="list-style-type: none"> Ensure higher penetration of asset monetization options such as infrastructure investment trust, toll-operate-transfer, etc. Shifting of asset ownership in favor of asset operators and/or private equity investors Target of achieving \$14.3 billion using asset monetization by 2024 Long-term financing via credit-enhanced project bonds
3	Penetration of technology in traffic management, safety, and security	<ul style="list-style-type: none"> Use of light detection and ranging guns and drones Speed regulators and digital messages on roads Extensive investment in automated road conditioning monitoring system

km = kilometer, SI = serial.

Source: Government of India, Department of Economic Affairs, Ministry of Finance. Undated. National Infrastructure Pipeline-Volume II. Report of the Task Force. Vision 2025 for the Road Sector (Slides 52 and 53).

APPENDIX 4: INDEPENDENT ENGINEER

Appointment and fee-sharing arrangement. The independent engineer shall be appointed within 60 days from signing the concession agreement for a duration of the construction period plus 6 months. On expiry or termination of the appointment, the authority will make another appointment for 3 years under terms of Schedule M.¹ The fees for the independent engineer—if it is within 3% of the bid project cost—is shared equally by the authority and the concessionaire, and any fee in excess thereof is borne entirely by the authority.

Duties. In addition to the obligations to determine costs of any works, any extension of period and to assist the parties in resolving their disputes, other roles and functions of the independent engineer are outlined below:

- (i) **Development period.** Review within 7 to 15 days of receipt of the following documents: drawings; support documents; survey and investigation reports; safety reports; detailed design; construction methodology; quality assurance procedure; working schedule; drafts of engineering, procurement, construction; or any other contracts for construction, operation, and maintenance.
- (ii) **Construction period.** Review drawings, documents, and reports; provide monthly progress reports; inspect the construction works and site monthly and prepare inspection report; administer quality tests of works including on defects rectified works; review construction progress and—in case of delay—instruct the concessionaire to propose measures to expedite progress; review the site safety situation and make recommendations for suspension of affected parts of the works, if any; review remedial measures taken by the concessionaire on suspended works and make recommendations; administer tests on completion; issue completion certificate or provisional certificate; advise the concessionaire in preparing a maintenance manual.
- (iii) **Operation period.** Review drawings, documents, and reports; review annual maintenance program; review monthly status report; inspect the project monthly and prepare inspection report; in case of defective works specify a time limit for repair and rectification; review request for closure of road lanes for maintenance or repair; monitor and review remedies of defects; review any proposed modification of the project; undertake traffic sampling; at expiry or termination of the concession agreement, inspect the project to determine compliance with the divestment requirement, any defects, and liability of the concessionaire.

¹ Government of India, Ministry of Road Transport and Highways. 2020. *Changes in the Model Concession Agreement (MCA) for NHs works under Hybrid Annuity Mode (HAM) Projects*. Clause 21.1. Delhi.

APPENDIX 5: CONDITIONS PRECEDENT FOR THE AUTHORITY AND THE CONCESSIONAIRE

Conditions precedent to be satisfied by the authority.¹ Upon submission of performance security within 30 days of signing the concession agreement, the authority is required to fulfill the following conditions precedent within 120 days from submission of performance security:

- (i) procure and provide the site to the concessionaire;
- (ii) procure all the applicable permits relating to environmental protection and conservation with respect to land forming the site;
- (iii) procure forest clearance for land forming the part of the site; and
- (iv) procure approval of the general arrangement drawings for the road over-bridges or under-bridges at all level crossings, if any.

Conditions precedent to be satisfied by the concessionaire.² The concessionaire is required to fulfill the following conditions precedent within 150 days of signing the concession agreement.

- (i) submit to the authority performance security and additional performance security, if so required, within 30 days from signing the concession agreement;
- (ii) execute and procure the escrow agreement;
- (iii) execute and procure the substitution agreement;
- (iv) procure all applicable permits as specified in the concession agreement;
- (v) execute and submit financing agreements to the authority;
- (vi) deliver to the authority a financial package and financial model which is acceptable to the senior lenders; and
- (vii) deliver to the authority confirmation of the correctness of the representations and warranties of all consortium members as required by the concession agreement.

¹ Government of India, Ministry of Road Transport and Highways. 2020. *Changes in the Model Concession Agreement (MCA) for NHs works under Hybrid Annuity Mode (HAM) Projects*. Clause 4.1.2. Delhi.

² Government of India, Ministry of Road Transport and Highways. 2020. *Changes in the Model Concession Agreement (MCA) for NHs works under Hybrid Annuity Mode (HAM) Projects*. Clause 4.1.3. Delhi.

APPENDIX 6: REQUIREMENTS TO DEPOSIT INTO AND WITHDRAW FROM ESCROW ACCOUNT

Table A6.1: Requirements to Deposit into and Withdraw from an Escrow Account

The concessionaire is required to deposit into an escrow account:	
(i)	all funds constituting the financial package;
(ii)	all revenues from or with respect to the project including the proceeds of any rentals, deposits, capital receipts, or insurance claims; and
(iii)	all payments by the authority, after deduction of any outstanding payments.
During the concession period, the concessionaire is required to appropriate the deposits in the escrow account in the following order:	
(i)	All taxes due and payable by concessionaire;
(ii)	all payments relating to construction of the project;
(iii)	O&M expenses, subject to the ceiling, if any are outlined in the financing agreement;
(iv)	O&M expenses and other costs and expenses incurred by the authority, as provided in the concession agreement;
(v)	any amounts due and payable to authority under the concession agreement;
(vi)	monthly proportionate provision of debt service due;
(vii)	all payments and damages due and payable to the authority by the concessionaire;
(viii)	debt service due of sub-ordinate debt;
(ix)	any reserve requirements as per financing agreements; and
(x)	balance, if any, following the instructions of the concessionaire.
Upon termination of the concession agreement, all standing amounts in the escrow account are required to be appropriated in the following order:	
(i)	all taxes due and payable by concessionaire related to the concession agreement;
(ii)	percentage of debt due, excluding sub-ordinate debt if so required by the agreement;
(iii)	outstanding payments due to the authority;
(iv)	all payments and damages due to the authority;
(v)	retention and payments relating to the liability for defects and deficiencies, required by the concession agreement;
(vi)	outstanding debt service including balance of debt due;
(vii)	outstanding sub-ordinate debt;
(viii)	incurred or accrued O&M expenses;
(ix)	any other payments that are required to be made under the arrangement; and
(x)	balance, if any, in accordance with the instructions of the concessionaire.

O&M = operation and maintenance.

Source: Government of India, Ministry of Road Transport and Highways. 2020. Model Concession Agreement for Hybrid Annuity Projects. Delhi.

APPENDIX 7: APPROPRIATION AND REPLENISHMENT OF PERFORMANCE SECURITY

Replenishment of performance security. If the concessionaire fails to meet any conditions precedent or there is specified default(s) under the agreement, the authority may appropriate from the performance security. The concessionaire is required to replenish the original amount of the performance security in case of partial appropriation—or provide fresh performance security in case of full appropriation—within 15 days of the appropriation.

Appropriation of performance security. Performance security can be called in for delays or failure to achieve any conditions precedent. The concession agreement lists an additional 24 non-exhaustive grounds for concessionaire default. These include failure to replenish performance security; misrepresentation; failure to achieve milestones; failure to rectify defects; failure to complete outstanding works listed in the provisional certificate; breach of maintenance or safety requirements; failure to cure the escrow default within the prescribed period; financial default; a breach associated with the contract causing material adverse effect; encumbrances in breach of the contract; repudiation of the contract or action or intention not to comply with the contract; ownership change in breach of the contract; a transfer of rights or obligations of the contractor causing adverse material effect; levy execution on contractor assets causing material adverse effect; bankruptcy or insolvency; or failure to comply with any obligation that entitles the authority to terminate the contract.

These measures compare to the FIDIC Red 2017¹ & Yellow 2017,² where the authority has exhaustive grounds to call in security for failure to extend the validity of the performance security until it has executed and completed the works and remedied any defects; failure to pay the authority an amount due, within 42 days after the agreement, determination, decision, or award under the contract, as the case may be; failure to remedy a defect stated in a notice to correct (Sub-Clause 15.1), within 42 days or other time stated in the notice; failure to repair, return, reinstall, and retest, any defective or damaged plant that was taken by it from the site, by the agreed date; or circumstances that entitle the authority to terminate the contract for contractor default (Sub-Clause 15.2).

¹ FIDIC. 2017. Conditions of Contract for Construction (Second Edition, 2017) for Building and Engineering Works designed by the Employer. Geneva. Para. 75.

² FIDIC. 2017. Conditions of Contract for Plant & Design-Build (Second Edition, 2017) for Electrical & Mechanical Plant & for Building & Engineering Works Designed by the Contractor. Geneva. Para. 75.

APPENDIX 8: CHANGE OF SCOPE CLAUSES

Procedures for changes of scope. If the authority considers that a change of scope is necessary, it will request the concessionaire to submit a proposal to the authority covering (i) impact of the proposed change on the project completion schedule, (ii) options for implementing the proposed changes and the effect of each option on costs and time, and (iii) a detailed estimate of the costs. Unlike in FIDIC contract forms, the term “cost” remains undefined, so this would bear contextual meaning. The cost reasonably incurred by the concessionaire in preparing the proposal would be reimbursed by the authority.

A change of scope is ordered after agreement is reached on its time and cost implications, but if consensus is not reached, the authority may order to proceed with the change of scope pending resolution on the cost and time impacts.

If the change of scope leads to a change in the length of the highway, the operation and maintenance payments are adjusted proportionally to the length change.

If the concessionaire fails to complete any construction work due to force majeure or for reasons attributable to the authority, such work scope changes would be omitted, and the project bid cost would be adjusted accordingly.

Payment for changes of scope. An advance payment of 20% of the agreed amount (or provisionally assessed amount if no agreement has been reached) of the change of scope would be paid to the concessionaire within 7 days of issuing the order. Progress payments for works in progress or completed are required to be made within 30 days of receipt of related bills, as certified by the independent engineer.

APPENDIX 9: STEPS TO CALCULATE COSTS OF REDUCED SCOPE

If the concessionaire is unable to complete remaining works for reasons attributable to the authority or due to force majeure, the following process is applied in calculating the total cost of the reduced scope:

Step 1: Assess the civil cost of the reduced scope as per the schedule of rates applicable on the bid due date.

Step 2: Multiply the civil cost of the reduced scope by 1.15 to arrive at the estimated cost of reduced scope.

Step 3: Multiply the estimated cost of the reduced scope by the ratio of the bid project cost to the estimated project cost to arrive at the total cost of the reduced scope.

APPENDIX 10: PAYMENT MILESTONES DURING THE CONSTRUCTION PERIOD

1st Milestone – Achievement of 5% physical progress
2nd Milestone – Achievement of 10% physical progress
3rd Milestone – Achievement of 20% physical progress
4th Milestone – Achievement of 30% physical progress
5th Milestone – Achievement of 40% physical progress
6th Milestone – Achievement of 50% physical progress
7th Milestone – Achievement of 60% physical progress
8th Milestone – Achievement of 70% physical progress
9th Milestone – Achievement of 80% physical progress
10th Milestone – Achievement of 90% physical progress

Source: Government of India, Ministry of Road Transport and Highways. 2020. Model Concession Agreement for Hybrid Annuity Projects. Delhi.

APPENDIX 11: INSURANCE COVER REQUIREMENTS DURING THE OPERATION PERIOD

During the operation period, the concessionaire is required to procure and maintain insurance cover including but not limited to

- (i) loss, damage, or destruction of the project assets—including assets provided by the authority to the concessionaire—at replacement value;
- (ii) comprehensive third-party liability insurance including injury to or death of personnel of the authority or others caused by the project;
- (iii) the concessionaire's general liability arising out of the concession;
- (iv) liability to third parties for goods or property damage;
- (v) worker compensation insurance; and
- (vi) any other insurance that may be necessary to protect the concessionaire and its employees, including all force majeure events that are insurable at commercially reasonable premiums and not otherwise covered in items (i) to (v) above.

Source: Government of India, Ministry of Road Transport and Highways. 2020. Model Concession Agreement for Hybrid Annuity Projects. Delhi.

APPENDIX 12: FORCE MAJEURE EVENTS

Nonpolitical event means one or more of the following acts or events:

- (i) act of God, epidemic, extreme weather conditions, lightning, earthquake, landslide, cyclone, flood, volcanic eruption, chemical or radioactive contamination or ionizing radiation, fire or explosion;
- (ii) strikes or boycotts not involving either concessionaire or authority, and not being indirect political events, but affecting supplies and services to the project for a continuous period of 24 hours and an aggregate period exceeding seven days in an accounting year;
- (iii) any delay or failure of other implementation contractors due to another non-political event, and which does not result in the concessionaire receiving any compensation from the contractor;
- (iv) any judgment or order of the court or statutory authority against the concessionaire;
- (v) discovery of geological conditions, toxic contamination, or archaeological remains on the site that were unforeseeable; or
- (vi) any event or circumstance analogous to any of the above.

Indirect political event means one or more of the following acts or events:

- (i) an act of war (whether declared or undeclared), invasion, armed conflict or act of a foreign enemy, blockade, embargo, riot, insurrection, terrorist or military action, civil commotion or politically motivated sabotage;
- (ii) any political or economic upheaval, disturbance, movement, struggle or similar occurrence which could not have been anticipated or foreseen by a prudent person and which causes the construction or operation of the project to be financially unviable or otherwise not feasible;
- (iii) industry-wide or state-wide strikes or industrial action for a continuous period of 24 (twenty four) hours and exceeding an aggregate period of 7 (seven) days in an accounting year;
- (iv) failure of the authority to permit the concessionaire to continue its construction works, with or without modifications, in case of stoppage of such works after discovery of any geological or archaeological finds or for any other reason;
- (v) any failure or delay of a contractor to the extent caused by any indirect political event and which does not result in any offsetting compensation being payable to the concessionaire by or on behalf of such contractor; or
- (vi) any indirect political event that causes a non-political event.

Political event means one or more of the following acts or events:

- (i) change in law;
- (ii) compulsory acquisition in national interest or expropriation of any project assets or rights of the concessionaire or other implementation contractors under the project;
- (iii) unlawful refusal to grant or authorize any clearance, license, or permit required by the concessionaire or any other implementation contractor to discharge their respective obligations;
- (iv) any failure or delay of an implementation contractor caused due to another political event; or
- (v) any event or circumstance analogous to any of the above.

Cost allocation due to force majeure

- (i) if a force majeure event occurs before the appointed date, costs lie where they fall;
- (ii) if a force majeure event occurs after the appointed date:
 - (a) nonpolitical event: costs lie where they fall;
 - (b) indirect political event: costs not exceeding the insurance cover to be borne by the concessionaire, and costs exceeding the insurance cover to be equally shared by the authority and the concessionaire;
 - (c) political event: all force majeure costs to be reimbursed by the authority to the concessionaire.

Source: Government of India, Ministry of Road Transport and Highways. 2020. Model Concession Agreement for Hybrid Annuity Projects. Delhi.

APPENDIX 13: TYPICAL HYBRID ANNUITY PROJECTS COMPLETED BY THE NATIONAL HIGHWAYS AUTHORITY OF INDIA

#	Project Name	Capacity (km)	Concession Authority	Appointed Date	Scheduled Completion Date	Actual Project Completion Date
1	Byrapura-Challakere Four Laning Road Project (NH-150) (Package II: Bharatmala)	49.95	NHAI	30 Jan 2019	31 Dec 2020	2 Jan 2021
2	Dausa-Lalsot-Kauthun Two/Four Laning Road Project (NH-11A Extn)	83.45	NHAI	21 Jun 2017	26 Nov 2019	24 Dec 2020
3	Delhi-Meerut Expressway Project (NH-24) (Package I)	8.71	NHAI	10 Oct 2016	27 May 2019	27 May 2018
4	Delhi-Meerut Expressway Project (NH-24) (Package II)	19.28	NHAI	6 Jun 2017	3 May 2020	1 Apr 2021
5	Delhi-Meerut Expressway Project (NH-24) (Package III)	22.27	NHAI	10 Oct 2016	16 Jun 2019	28 Aug 2019
6	Handia-Varanasi Six Laning Highway Project (NH-2)	72.39	NHAI	10 Jan 2018	20 Jun 2020	30 Nov 2020
7	Kagavadar-Una Four Laning Road Project (NH-8E) (Package IV)	40.98	NHAI	25 Jul 2017	30 Jul 2020	11 Aug 2020
8	Kharar-Ludhiana Four/Six Laning Road Project (NH-95 and NH-21)	76.01	NHAI	22 Jun 2017	11 Sep 2019	1 Jun 2020
9	Lucknow-Sultanpur Four Laning Road Project (NH-56)	127.42	NHAI	19 Jul 2017	26 Aug 2020	23 May 2020
10	Mahagaon-Yavatmal Four Laning Road Project (NH-361) (Package II)	80.19	NHAI	18 Dec 2017	26 Aug 2020	23 May 2020
11	Meerut-Bulandshahar Four Laning Highway Project (NH-235)	61	NHAI	13 Apr 2017	25 Oct 2019	26 Nov 2020
12	Munabao-Dhanana-Tanot Two Laning Road Project (NH-70)	273.86	NHAI	26 Jun 2019	28 Jun 2021	1 Dec 2020
13	Ranastalam-Anandpuram (Visakhapatnam) Six Laning Road Project (NH-16) (Package II)	47	NHAI	22 Sep 2017	13 May 2020	30 Sep 2020
14	Rohna/Hassangarh-Jhajjar Four Laning Road Project (NH-334B) (Package II)	35.45	NHAI	11 Sep 2018	16 Dec 2020	14 Jul 2020
15	Salasar-Nagaur Two Laning Road Project (NH-65) (Package II)	119.59	NHAI	1 Apr 2017	23 Sep 2019	28 Jan 2019
16	Tuljapur-Ausa Four Laning Road Project (NH-361)	67.42	NHAI	20 Nov 2017	20 May 2020	18 Nov 2019
17	Wardha-Butibori Four Laning Road Project (NH-361)	59.19	NHAI	20 Nov 2017	27 May 2020	20 Nov 2019
18	Yavatmal-Wardha Four Laning Road Project (NH-361) (Package III)	64.92	NHAI	5 Feb 2019	1 Aug 2020	2 Aug 2020

km = kilometer, NHAI = National Highway Authority of India.

Source: Information as obtained from NHAI website, investor presentations, rating reports of respective entities.

APPENDIX 14: IMPLEMENTATION IN STATE HIGHWAY PROGRAMS

Table A14.1: Status of ADB Hybrid Annuity Model Tranche 1 Projects in Rajasthan

S. No	Name of the Project	Length (in km)	Project Cost (In ₹10 million)	Construction Commencement Date	Scheduled Completion Date	Project Completion Status
1.	Kanwas-Khanpur-Aklera	74.82	136.80	5 Aug 2017	4 Aug 2019	Third milestone achieved
2.	Deoli-Kanwas	14.85	45.97			
3.	Alot (MP)-Gangdhar-Suwanasara (MP)	24.55	36.12			
4.	Khedali-Pahadi	61.16	116.01			
5.	Barmer-Sindari-Jalore	148.09	281.64	25 Aug 2017	24 Aug 2019	Provisional completion on 4 Apr 2019
6.	Ahore-Bali-Mundara	29.42	65.13			
7.	Peelibangla-Lakhuwali	34.55	71.99	4 Sep 2017	3 Sep 2019	Provisional completion on 06 Aug 2018
8.	Saradarshar-Lunkaranaraswar	75.80	123.58			
9.	Churu-Bhaleri	35.00	63.59			
10.	Sanju-Tarnau	16.70	34.80			
11.	Roopangarh-Naraina	34.79	62.39			
12.	Nagaur-Tarnau-Deedwana-Mukundgarh	196.00	557.92			

ADB = Asian Development Bank, km = kilometer, MP = Madhya Pradesh.

Source: Government of Rajasthan, Public Works Department. Project Progress. <https://rshipadb.com/ProjectStatus.aspx> (accessed on 30 July 2021).

Table A14.2: Status of ADB Hybrid Annuity Model Tranche 1 Projects in Madhya Pradesh

S. No	Package	Project Name	Concessionaire	Agreement Date	Length (km)	Cost (\$ million)	PA Up to March 2021	FA Up to March 2021
1	Pkg-1+B4:B48	Bhabra - Kattiwada - Kheda Road	M/s Shreeji Infraspace Highway Pvt. Ltd.	7 Jul 2020	35.9	16.4	0.0	0.0
2	Pkg-1+B4:B49	Bhabra - Udaigarh Road			24.9	9.5	0.0	22.8
3	Pkg-2	Udaigarh - Bori Road	M/s Shreeji Udaigarh	23 Jan 2020	15.5	6.6	0.0	0.0
4		Tanda - Bori Road	Balwadi Highway Pvt. Ltd.	23 Jan 2021	17.6	8.9	0.0	20.9
5		Tanda - Balwadi Road		23 Jan 2022	20.1	8.8	0.0	0.0
6	Pkg-3	Jobat - Nanpur Road	M/s NPM Jobat Nanpur Pathways Pvt. Ltd.	21 Jan 2020	21.9	9.0	0.0	17.0
7	Pkg-4	Alirajpur - Mathwad Road	M/s Alirajput- Mathwad Highways Pvt. Ltd.	23 Jan 2020	56.2	26.1	0.0	23.6
8	Pkg-5	Badwani - Badhan - Ambapani - Sindhi - Khodar Silawad Road	M/s Badwani- Badhan Highways Pvt. Ltd.		17.9	12.0	0.0	0.0
9		Dhavabawdi - Balkua - Lonsara - Borlay Road			11.0	5.6	0.0	16.1
10	Pkg-18	Pipaliya Kevat - Ghatgheri (Raisen) - Ghatkheri (Raisen) to Sahajpur - Salabaru - Ghatkheri (Sagar) and Pratapgarh - Salabaru	Under Review	-	35.6	15.8	0.0	0.0
11		Salabaru - Gutauri - Gutauri - Deori - Gorakhpur - Ghahlayan - Ghahlayan - Sadrai - Sadrai - Heerapur - Heerapur - Kaakraghat (Narmada Bridge)			36.5	18.0	0.0	0.0
12	Pkg-19	Maharashtra Border - Kukru - Khamla - Bhaidehi	M/s Udit Khamla Highways Pvt. Ltd.	31 Dec 2019	30.2	12.9	0.0	22.7

continued on next page

Table A14.2 continued

S. No	Package	Project Name	Concessionaire	Agreement Date	Length (km)	Cost (\$ million)	PA Up to March 2021	FA Up to March 2021
13	Pkg-25	Sultaniya - Pipalkheda - Salaiya Road	Feasibility under preparation by M/s AICONS	-	12.8	5.5	0.0	0.0
14		Basoda - Gurod - Somvara - Enchda - Imaliya - Sironj Road	(blank)		35.0	15	0.0	0.0
15	Pkg-35	Amravad - Bharkachh Road			17.3	Yet to be determined	0.0	0.0
16		Obedullaganj - Magarpunch - Ashapuri - Bhojpur Road			14.7	24.1	0.0	0.0
17		Chikhlod - Raisen Road			24.8	Yet to be determined	0.0	0.0
18		Vidisha - Ahmadpur - Gadi - Gairatganj			18.9	Yet to be determined	0.0	0.0
19	Pkg-42	Shipra Budhi Barlai - Solsinda - Khandakhedi - Jamodi - Maharajganj Biloda Nayda - Panod Sanver road	Feasibility under preparation by M/s AICONS		28.9	12.4	0.0	0.0
20	Pkg-52	Siddikganj - Hatpipaliya Road	M/s Brjigopal	10 Jul 2020	21.2	7.0	0.0	0.0
21		Bhaukhedi - Amlaha - Dhamanda Road	Construction Company Pvt. Ltd.		17.9	7.1	0.0	0.0
22		Toomda - Patania - Barkheda Saalam Road Length 12.80 Km			9.7	3.3	0.0	0.0
23	Pkg-10	Pawai - Mohindra - Semaria Road	Bid Evaluation I/P	-	37.5	14.2	0.0	0.0

ADB = Asian Development Bank, FA = financial achievement, PA = physical achievement, Pkg = package.

Source: Government of India, Madhya Pradesh Road Development Corporation. 2021. Monthly Status Report (May 2021) as published on August 11, 2021.

Cost here refers to authority's estimate.

Source: Madhya Pradesh Road Development Corporation Limited. <http://mprdc.gov.in/> (pp. 15-16).

The Hybrid Annuity Model for Public–Private Partnerships in India’s Road Sector

Lessons for Developing Asia

The Hybrid Annuity Model (HAM) has significant potential to enable developing members of the Asian Development Bank to boost investments in public infrastructure through public–private partnerships. This paper presents the results of a study that assessed the drivers and innovative features of HAM from its application in India’s road sector. The innovative features identified include financial risk sharing between the government and private sector, amenable qualification criteria to sustain the supply and demand base beyond large companies, high project readiness requirements, and flexibility elements to promote innovation. The paper makes suggestions on how the adoption of HAM can be enhanced in other sectors and countries.

About the Asian Development Bank

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 68 members—49 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

