

CONCLUSIONS

9.1. INTRODUCTION

Metro system has become a sort of status symbol. There is competition among states and cities to announce metro projects and budgetary resources allocated to approved projects, operational or under construction (see Table-1.1) sum up to more than `2.30,000 crores. India definitely needs to speed up building metro systems in Indian cities but not at the cost of priority sectors such as health, sanitation and education which compete for budgetary resources and cannot be overlooked for allocations.

12th five year plan recognising this impasse has rightly advocated that “all metro projects which are in high density corridors, and are viable on their own with admissible Viability Gap Funding and real estate development on land may be encouraged under PPP mode” The plan document also acknowledges “the huge requirement of capital and willingness as well as capability of the private capital to undertake urban transport project.” (12th FYP).

However, interestingly a remark in the plan document about public private partnerships existing only in 12% of the cities in the world has also raised a doubt on the success of a PPP metro system. (WG on 12th FYP based on a study of 132 cities).

Since PPP's in infrastructure construction was not evolved or was still evolving when most of the metro lines included in the study were constructed, this analysis by working group can hardly be a damning critique. Moreover, even where PPP models have not fared well in metro projects, would pure public sector models have fared better?

The policy makers and city planners need to appreciate that another disappointment with a PPP metro projects like the Delhi airport metro express line fiasco would discourage private investment and will also result in higher cost of future PPP metro projects. A public private partnership in a metro

project is no different from say, an airport where public infrastructure is created by a private party under long term concession for providing service and Delhi and Mumbai airport stand testimony to success of such partnerships. In the final analysis, it boils down to specifics of a particular metro project. How the private partner has understood and evaluated the risks in a metro project and how effectively it has been able to factor it into bid price is important. Equally important is the public authority's inclination, competence and determination in fair evaluation of such proposals and take them forward continuously innovating to resolve the problems in implementation typically encountered in any complex PPP project such as a metro system.

Critical success factors influencing the success of a PPP metro project has assumed significance in the realm of PPP infrastructure research in India. A PPP metro project is a complex bundle of contractual arrangements involving multi-parties. Understanding the critical success factors that influence each stage of a metro project and addressing the related strategic issues is imperative to the growth and sustainability of public private partnerships in rail based metro systems in India. The main motivation for the present study has been to make an attempt to contribute to this body of knowledge.

This chapter presents the major learning and implementation issues arising out of the research work. Learning from the Pilot Study, Opinion Survey and SAP-Lap study have been presented in the previous chapter identifying the gaps and common findings and also compared with the findings of earlier researchers. A summary of learnings and recommendations are concluded in the ensuing paragraphs to get better clarity on the significance of macro variables in contributing to the success of a PPP metro in Indian context. The chapter also highlights the contribution of the present study to the existing knowledge and research and potential usefulness to the stakeholders of a rail based mass rapid transit system in India on a public private partnership framework.

9.2. Summary of Main Findings

As outlined in Section 4.2.5 of Chapter-4, the research objectives are

reproduced below:

- Objective-1 :** To identify key performance indicators which define the success of a public private partnership for rail based urban mass transit systems (PPP metro system) in India.
- Objective-2 :** To identify the critical success factors impacting PPP metro systems and their relative importance.
- Objective-3 :** To develop conceptual framework for success in a PPP metro system in Indian context.
- Objective-4 :** To identify the differences and similarities in public and private sector stakeholders on the significance of critical success factors in influencing the success of a PPP metro systems in India

Accordingly, the different components of the research i.e. pilot study, opinion survey and SAP-Lap field study were conducted, analyzed and synthesized aimed at the above four objectives. A summary of the findings is presented here, reflecting upon achievement of the research objectives.

- Pilot analysis validates that all twelve performance indicators for defining success of a PPP metro identified through literature survey are indeed significant in Indian context. The twelve indicators define the success of a metro project through three distinct stages, four for each stage, namely; Contract Success (‘quality and completeness of the contract’, ‘appropriate risk sharing and risk allocation’, ‘selection of concessionaire and finalisation of contract agreement’ and ‘financial closure within stipulated time’), Implementation Success (‘timely project delivery’, ‘project completion within budget’, ‘scope of the project as per contract’ and ‘quality of construction’) and Post Implementation Success (‘ridership recovery in short and long term’, ‘last mile connectivity’, ‘service quality in O&M and user satisfaction’)
- All the eighteen factors identified through exploratory research (refer Table-2.4 and 2.5) are validated through quantitative research and are found to be significant factors which impact the success of a PPP metro in Indian context.
- While there is no significant difference in parameters, yet relative importance of parameters as revealed in univariate analysis shows that

‘contract agreement’ and ‘Government support’ are the two most significant parameters.

- Cluster analysis indicates that there are eight clusters among the micro variables or critical success factors. The six macro variables or macro success factors (two external and four internal) initially identified based on literature survey have been revisited. The eight clustered emanating from cluster analysis have been grouped under three external factors; ‘socio-political-environment’, ‘stable macro-economics and institutional legal framework’ and ‘government support’ and four internal factors; ‘good governance’, ‘effective procurement’, ‘well Structured PPP Project’ and ‘PPP Implementation Processes’.
- The above macro factors were tested in real life settings of Hyderabad metro in a field study based on semi structured interview of key players and analysis of observations utilising SAP-LAP methodology.
- Based on the literature survey, SAP-LAP study and expert opinion, directional relationships were defined in the hypotheses of association among seven macros. Test for hypothesis of association by the regression analysis was carried out to develop the final framework. The relationships emerging from the validated framework have been interpreted and synthesized with findings from other components of research.
- Based on pilot data analysis, step wise regression was carried out to identify a useful subset of the independent variables or predictors i.e. critical success factors for each of the twelve response variables or performance indicators. The analysis has resulted in highlighting as to which CSFs are impacting which performance indicators that define success of a PPP metro project at three different stages of project life cycle. Outcome of the step wise regression has been interpreted and found to be in harmony with other findings of the study. Synthesized and integrated findings have been presented in previous chapter.
- There is no significant difference in the perception of private and public sector in India on the significance of critical success factors which impact the success of a PPP metro in Indian context in case of majority of factors i.e. 13 factors as established through Anova and Mood and median test. In case of five factors namely; ‘stable macro-economic environment’, ‘techno-economic feasibility of the project’, ‘good governance’, ‘government

support and guarantee’ and ‘strong consortium’ the perception of the two sectors as to their relative significance differ. While private sector attaches relatively higher significance to first four than government sector, government sector does so for fifth factor.

- A study of how the situation in a metro project unfolds, roles the actors play and the processes that are deployed in a given context and analysis of observations on outcome has highlighted key learnings and action points which are relevant to the study. This knowledge is in harmony with other findings of the study. Field study of Hyderabad metro demonstrates that it is possible to anticipate improvement in performance of a metro project in terms of better processes, improved roles of actors or situational factors through appropriate actions.

9.3. RECOMMENDATIONS

Findings of the opinion survey as well as SAP-LAP study have been reflected upon and some recommendations have been generated in order to find out ways and means to improve success of future PPP metro projects in the country. The recommendations emanating from various components of research are discussed below with reference to macro and micro variables and relevant research findings.

- ‘Government support’ is crucial to success of a PPP metro project. Central government’s support is reflected in policy stimulus for encouraging private investment, establishing norms for eligibility of viability gap funding, institutional and legal framework and approval procedures for sanctioning rail based mass rapid transit systems on PPP framework. It is state government which has to take into account the local socio-political ethos and carefully assess the challenges in implementing a metro project on PPP basis. A good ‘techno-feasibility study’, and ‘stakeholder consultation’ will not only help in preparing a well structured contract but will also attract private sector investment as the sector attaches great significance to these factors in the success of such a project.
- State government also has to set up a team of dedicated and competent professionals to run SPV and delegate adequate powers for decision making. Formation of an SPV is mandatory for government’s approval of a metro project irrespective of mode of financing. A ‘strong, capable and

well organized public agency' or the SPV which will structure and implement a PPP metro project has emerged as the most significant variable in contributing to the success of each stage of a metro project in pilot study and was validated in real life case of Hyderabad metro in the first two stages of the project.

- The state government has to demonstrate principles of good governance in its dealings which should reflect in the affairs of the public agency dealing with PPP metro.
- The structuring of PPP project with proper risk evaluation and appropriate risk sharing, supported by a robust concession agreement and backed up by institutional and legal framework can attract a competent and strong concessionaire if the selection process is fair and transparent. The agency's role in scoping and structuring the project can hardly be overemphasized and has been corroborated through Hyderabad field case study.
- 'Strong consortium' and 'structuring of project' through 'proper risk allocation' appear to be common in most of the earlier studies on CSFs in PPP projects too. Since public sector and private sector respondents while agreeing on most of the factors put relatively greater emphasis on the role of other party; private sector highlighting 'good governance' and 'government support and guarantee' and public sector highlighting the importance of a 'strong consortium', the public agency can practice and should be seen as practicing 'good governance'. Selection of a 'strong consortium' is an outcome of transparent and fair procurement process. 'Government support' and perception of 'good governance' instills confidence among private investors. As has been seen in case of Hyderabad metro, a technically strong party with project management skills plays most significant role in technology selection, innovations in design and engineering of the project bringing in benefits to the public utility infrastructure that might not have been available had the project been executed as a government project.
- During field study of Hyderabad metro, output based manual of specifications, an integral part of concession agreement was cited by both public sector and private sector respondents as a great contributor to smooth implementation and monitoring for compliance. This can be used

by other cities for implementing metro systems in their cities on PPP framework to avoid the kind of potential risks and for better compliance.

- The success of deploying PPP as an additional policy instrument for creating metro infrastructure in India will depend on the change in attitudes and mindsets of all the authorities as learnt during the study where interactions were held with a number of officials from various metros. Central government and Niti Ayog should take up the issue for creating awareness and educating political leadership and civic authorities on proper structuring of a PPP metro project, allaying apprehensions about PPP framework and for capacity building
- The model concession agreement prepared for Hyderabad can be revisited to provide more clarity on some of the terms and definitions based on the learnings from the field study.

9.4. SIGNIFICANT RESEARCH CONTRIBUTIONS

The research is carried out in the context of Indian metro sector by taking the sample of respondents belonging to public and private sector with experience in metro/railway projects. The learnings of this study can be of use to the following segments of the society:

- Central and state government organization involved in policy formulation, preparing model concession agreements and setting norms and procedures for undertaking metro projects on PPP framework.
- Private sector organizations willing to lend their financial and managerial capital to successfully and profitably create the metro rail infrastructure in India's aspiring smart cities, a sector likely to register tremendous growth in near future.
- Researchers and academicians interested in the subject of public private partnerships in urban transportation.

Significant contributions made in this research work are highlighted below:

- For the first time performance indicators which define the success of a PPP metro and critical success factors impacting the success of a PPP metro have been validated in Indian context.

- For the first time, SAP-LAP framework has been used for case study of a PPP metro project which establishes its usefulness in providing excellent visibility into the factors which play important role in the project structuring and implementation.
- The study may help private sector with insights into impact of CSFs on each stage of the metro implementation to help them understand the importance of proactive involvement in a metro project. Understanding and evaluating risks involved at each stage will facilitate proper decision making.
- Analysis of the experience with the three PPP metros in the country and the findings of the study may highlight to the public agencies the significance of role played by them in a PPP metro project. Mere transfer of major economic risks to the private operator does not absolve public agency or the government from its responsibility or successful execution of a metro project. It remains accountable to the public for quality of metro infrastructure and delivery of a sustainable performance.
- The key contribution of the study is in enriching extant literature of critical success factors for urban metro systems on PPP framework.

9.5. LIMITATIONS OF THE STUDY

The research scope is limited to public private partnerships in rail based urban mass transit systems in India.⁷

The study is based on an opinion survey of critical success factors distilled through literature and validated through experts and pilot study. While every care has been taken in selection of experts and respondents with respect to their knowledge and experience on public private partnerships in rail based mass transit systems, some amount of personal/judgmental bias is bound to creep in.

Hyderabad metro is under implementation and scheduled to start operations in June, 2017. While the study has effectively brought out the significant role played by factors in project structuring and its implementation so far on a PPP framework, truly speaking the success of Hyderabad metro can be assessed only after commissioning of the project and its operation for significant length of time. Project's time and cost overrun, how quickly the

⁷ Referred interchangeably as MRTS, metro projects, metro systems or simply metros throughout the study).

operations are stabilized, quality of O&M, customer service and overall user satisfaction are some of the important criteria to term a metro project as successful in achieving its objectives.

9.6. SUGGESTIONS FOR FURTHER RESEARCH

Failed experience with Delhi airport line, fare revision dispute in Mumbai metro and difference of interpretation of contract terms in case of Hyderabad metro only confirm Kelkar committee's opinion that a mechanism has to be developed for accepting uncertainties and appropriate adjustments inherent in implementing long-time contracts. "Given the market and technological uncertainties, the PPP management will take decisions based on incomplete information. Hence, a decision which looks problematic "ex-post" need not necessarily be considered as mala fide." A metro contract with all its complexities is an apt example of an 'incomplete contract' a term brought into focus with the recent Noble Award to Oliverr Hart and is a fit case for further research on ways to deal with uncertainties and adjustments during implementation and post implementation stage.

Hyderabad metro is the first PPP metro in India where concession includes real estate development to augment revenue as the fare box revenue alone would not have made the project viable. Further it is also the first PPP metro project where traffic risk has been partly shared by the government with a provision for increasing/reducing the concession period in case of actual traffic being less/more than the projected traffic. While the facts evidenced so far point towards success of this approach in selection of a good consortium and making a PPP metro project bankable achieving financial closure, it could be a subject of further study to explore whether there could be better alternatives of funding and structuring a PPP metro project.

9.7. CONCLUDING REMARKS

The chapter clearly brings out the summary of findings, recommendations, implication of the research, significant research contributions, limitations of the research and suggestions for future research. It may be recalled that after the introduction in chapter one, chapter two narrates thematic literature review on metro systems implemented on a PPP

framework, analyzes extant research on critical success factors in PPP metro and examines the key concepts of PPP. Chapter three studies Indian experience with the three metros attempted on a PPP framework. Chapter four described the research methodology. Chapter five provided details of the pilot study conducted as a mini version of the full-scale study and also for pre-testing of the research instrument. The pilot study data was also used to evaluate which CSFs are impacting which performance indicators. Chapter six has presented data analysis and results of a comprehensive opinion survey. Chapter seven brings out findings from a field study on a real life case of Hyderabad metro. Chapter four to seven form the basis of chapter eight that presents synthesis of all findings and interpretation of the results. Last but not the least, ensuing chapter nine concludes the study with recommendations, scope for future study and the limitations of the study.