

## **SYNTHESIS OF LEARNINGS**

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### **8.1. INTRODUCTION**

A metro project is capital intensive and fraught with imponderable risks, long gestation periods and budget constraints. The government has promoted a financial assistance scheme which supports public-private-partnerships (PPPs) for metro projects in Indian cities through viability gap funding. The government's proposal to bring new metro act and metro policy clearly point towards its keenness to facilitate PPP in metro construction. Infusion of private investment, project expertise and management can overcome budgetary constraints on metro investment and also bring in efficiency in project execution. Indian experience has shown that the sector where private players have participated in investment, creation and operation of public utility infrastructure services either solo or in public private partnerships, the sector is recording growth. This experience needs to be replicated in rail based metro systems to speed up metro construction in growing Indian cities without stretching fiscal resources.

While the failure of first PPP metro, Delhi airport metro line has put a question mark on the future of PPPs in rail based MRTS, the way Hyderabad metro project has been structured and implemented, it could emerge as a light house for other Indian cities. What is required is the knowledge on how to properly structure a PPP metro project and for this a clarity and focus on what contributes to a successful PPP metro project in Indian context is a prerequisite. While in India the subject is still evolving, even outside India, research on critical success factors in public private partnership projects in urban transport especially rail based urban mass transit systems is scarce. This has been a big motivator to the researcher to explore enabling factors for successful public private partnerships in rail based urban mass transit systems in India.

This chapter presents the key learning and key implementation issues, arising out of the research work. Major learning from the literature survey, Pilot Study, Opinion Survey and SAP-LAP study have been synthesized to get

clarity on the significance of critical success factors in contributing to the success of a PPP metro in Indian context. The chapter also brings out interpretation of relationships of macro variables through insight gained from the framework, before bringing out key implementation issues.

## 8.2. KEY LEARNINGS FROM PILOT STUDY

In the beginning of the study, criteria to define a PPP metro successful were established based on literature survey. Four performance indicators were defined for each stage in a PPP contract; ‘contract success’ ‘implementation success’ and ‘post implementation success’. Pilot study validates that all twelve performance indicators for defining success of a PPP metro identified through literature survey are indeed significant in Indian context.

Pilot analysis has also helped us to gain an insight into the relationship between dependent and independent variables i.e. performance indicators and critical success factors. In the pilot analysis we have used step-wise regression to select few CSFs which are predictors of a particular performance indicator. This way we have an array of CSFs which are more significant in influencing performance indicators at each stage of PPP metro project which are tabulated in Table-8.1

**Table-8.1 Impact of CSFs on the Three Stages of a Metro Project**

No.	CSF/Project Stage	Contract Stage	Implement-ation Stage	Post Implement-atio Stage
B1	Political/social environment/support		X	X
B2	Stable macro-economic environment	X	X	
B3	Institutional & Legal Framework		X	
B4	Financial market availability	X		
<b>B5</b>	<b>Capable &amp; well organised public agency</b>	X	X	X
B6	Good governance	X		X
B7	Consultation with stake holders	X		X
B8	Multi benefit objectives for all stake holders from the project			X
B9	Thorough Cost-Benefit Analysis of the project	X		

B10	Techno-economic feasibility of project	X	X	
B11	Competitive and transparent procurement process		X	
B12	Strong consortium – technically, financially competent with experience and project management skills		X	X
B13	Government support and Government Guarantee for the project	X	X	
B14	Risk analysis and proper risk allocation in a PPP project	X	X	
B15	<b>Contract Agreement - completeness with respect to roles and responsibilities of partners, risk allocation and sharing, methods of risk mitigation, provisions for contingency situations etc.</b>	X	X	X
B16	Contract compliance for results- monitoring by public agency for execution and performance standards in accordance with contract		X	
B17	Commitment, responsibility and defined role of partners		X	
B18	Shared authority between public and private agency			X

Note: 'X' denotes positive impact

The learnings from Pilot Study can be summarized as follows:

- A strong, capable and well organized public agency and a well structured contract agreement with defined roles and responsibilities of both the partners emerge as the most important determinates of success of a rail based metro system in Indian context. These two factors significantly impact a PPP metro during all stages of the project. (Highlighted in the table 8.1)
- How well the 'techno-economic feasibility' has been carried out will determine the extent of participation of private players in bidding for the metro project taking it to first stage of 'contract success'. Its implementation to a large extent will also be impacted by the fair technical

and financial estimates of the ‘techno-economic feasibility’ report.

- ‘Risk analysis and proper risk allocation’ in the contract will lead to selection of a ‘good consortium’ and then to successful implementation.
- ‘Government support and government guarantee’ impact the success of a metro project during pre-implementation stage. Government support is essential during implementation phase too.
- In a PPP metro project it is imperative to select a ‘strong technically and financially competent consortium’ not only to implement a metro project but also to operate, maintain well during the period of concession and deliver quality service to users’ satisfaction.
- Political/social support helps in successful implementation of a metro project.
- ‘Monitoring by public agency for contract compliance’ by the public agency plays most significant role in ensuring that metro project is completed in time and delivered as per contract specifications both in terms of scope and quality.
- ‘Competitive and Transparent procurement’ process indirectly helps implementation on account of its role in selection of a good consortium partner.
- Implementation of a metro project is influenced by commitment of both public and private partners and how well their roles have been defined under the concession agreement.
- A project conceived and implemented with multi-benefit objectives for all the stakeholders will help in achieving sustainable performance post implementation. Taking into account the feedback, motives and objectives of stakeholders in design of infrastructure and services enhances the likelihood of resolving issues such as ‘last mile connectivity’ and increases ridership and user satisfaction

### **8.3. KEY LEARNINGS FROM OPINION SURVEY**

Based on literature survey eighteen critical success factors were identified which contribute to success of a metro project developed and implemented on PPP framework. These factors distilled through exploratory research are indeed significant in contributing to the success of a metro project.

The learnings from opinion survey are summarized below:

- Role of government in supporting a PPP metro emerges as the most significant contributor to its success. It has to create a conducive socio-political-economical environment where private capital and management can be infused for construction of metro. It has to establish institutional and legal framework conducive to public private partnerships in metros. ‘Good governance’ as can be seen in the validated PPP framework is a derivative of all the three macro factors; ‘government support’, ‘socio-political environment’ and ‘enabling macro economics and institutional, legal structure’. The government should practice and should be perceived as practicing good governance in all its dealings. Good governance is top down process and should percolate down to public agency which will represent government in public private partnerships for implementation of a metro project.
- It can, therefore be inferred from the validated framework that a stable macro-economic environment & institutional & legal framework will influence prevailing socio-political environment in a state which in turn will promote good governance.
- While government support is required to well structure a PPP program and the underlying concession agreement, the reverse is also true i.e. if a PPP project is structured well, it would help in obtaining support of the government. (As evidenced from the two way arrows/paths in the validated framework between the two factors). For example, the new government of Telangana continued to support PPP metro as it had confidence that the project was well structured.
- Government support, prevailing macro-economic environment and enabling institutional and legal framework will help in effective procurement process.
- All the above macro factors are predictors of PPP implementation processes which lead to the success of a PPP metro project.
- 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 s

established through Anova and Mood's median test. 'Good governance', 'government support and guarantee' and 'strong consortium' are three factors where both the methods reveal significant difference in perception of the two sectors. While private sector attaches relatively higher significance to first two than government sector, government sector does so for fourth factor. Private sector seems to attach relatively higher significance to stakeholder engagement and techno-economic feasibility of the project in the success of a PPP metro.

#### **8.4. KEY LEARNINGS FROM SAP-LAP STUDY OF HYDERABAD METRO**

All the critical success factors contributing to success of a metro project on PPP framework have been validated in real life settings of Hyderabad metro. The learnings from SAP-LAP study are presented below:

- The seven macro success factors have played more significant role in Hyderabad metro during its conceptualization, project structuring, and selection of concessionaire and contract finalization stage than during its implementation. Pre-implementation activities are crucial to ultimate success of a PPP metro.
- Government's expenditure on the project is only ` 1458 crores towards the viability gap fund plus a few hundred crores plus compensation for shifting of public utilities from the construction site. Hyderabad metro has set an example of how a key infrastructure facility can be created with provision for its operation and maintenance for 30 years through PPP without spending or committing huge budgetary resources.
- 'Government support' emerges as the most significant factor in the success of a PPP metro. State government has not only to support the program with necessary policy stimulus and clearances but is also responsible for influencing a socio-political-eco system in favour of the project through awareness campaigns highlighting the benefits to stakeholders. State government has also to set up a 'strong, competent and empowered public agency' to structure a PPP project and oversee its implementation not as a monitoring agency but as a facilitator and a team player. Success of a massive PPP project such as metro system depends to a large extent on how

well the role is played by the public agency.

- 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. 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.
- Proposed alignment of the metro line through densely populated and busy areas of old Hyderabad city posed a major challenge. The delay in obtaining right of way and necessary permits for the project resulting in the delay in the start of the project has been a major source of discord and blame game between private and public agency in Hyderabad metro. As a suggested approach, future projects may consider obtaining 50% or more right of the way and all necessary permits before the appointed date. A further clarity in the concession agreement on what constitutes right of the way for constructing a metro corridor will help avoid such situations in future projects.
- The utility of SAP-LAP framework in analysis of a large PPP project implemented on a PPP framework is established through the case study. The role of Situation, Actors and Process (a construct) is proved to be a good predictor of project performance. The study helps us to gain insight into the significance of key factors and their interplay in the project implementation.

## **8.5. SYNTHESIS OF FINDINGS : LEARNINGS FROM THE STUDY**

Although, the questionnaires designed for Pilot Study, Opinion Survey and questions discussed in SAP-LAP study of Hyderabad metro were different in size; the results given in both studies are by and large similar and complimentary. When case was analyzed, in a face-to-face interaction with concerned senior executives involved/associated with implementation of a PPP metro, a better insight was gained into the variables, their inter linkages

and influence on the success of the project. This has facilitated cross-validation of findings of opinion survey with a real case. Salient points emerging from the comparative analysis of findings (Table-8.1) from Pilot Study, Opinion Survey and SAP-LAP study of Hyderabad metro are highlighted in Table-8.2 .

**Table 8.2: Comparison of Pilot Study, Opinion Survey and SAP-LAP Study**

<b>FACTOR</b>	<b>Pilot Study</b>	<b>Opinion Survey</b>	<b>SAP-LAP Study</b>
Socio-political environment	Influences success during implementation and post implementation phase.	A Predictor of Stable macro-economics & Institutional legal framework and Good governance. Contributes to PPP implementation processes	Has emerged as a significant factor in influencing success during implementation phase.
Stable macro-economics & Institutional, legal framework	Influences success during contract stage and implementation phase.	Predicts Good governance. Contributes to Effective procurement and PPP implementation processes. Private sector attaches higher significance to the factor than public sector.	Have contributed significantly in achieving contract success.
Government Support	Influences success during contract stage and implementation phase.	Most crucial success factor. Role in creating Socio-political environment and good governance Private sector attaches higher significance to the factor than public sector. Combined rating second after contract agreement.	Most crucial success factor. Role in creating Socio-political environment and good governance
Good Governance	Contributed to success in all three stages of the contract	A capable public agency follows principles of good governance-significant contributor to success. Private sector ranks the factor higher in significance than public sector.	Proactive role played by a capable public agency and the process followed for coordination and decision making emerges as the most important factor in contract finalisation stage

			and during implementation.
Effective Procurement	Effective procurement helps in selection of good consortium which is crucial for successful implementation and for sustainable performance post implementation.	Government support, prevailing macro-economic environment and enabling institutional and legal framework will help in effective procurement process. Public sector attaches higher significance to 'Strong Consortium' than private sector.	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.
Well Structured PPP Project	Success in all three stages of the contract	Rated most significant by respondents. While government support is required for well structured PPP metro project. a well structured project also helps garnering Govt support (Hyd metro)	The structuring of PPP project with proper risk evaluation and appropriate risk sharing, supported by a robust concession agreement has been significant contributor so far to the progress of the metro.
PPP Implementation Processes	Success in all three stages of the contract	All the above macro factors will influence PPP implementation processes resulting in successful implementation of a PPP metro project.	Implementation processes deployed during project structuring and implementation have been significant contributor to the success of the project thus far.

The general findings of the study can be summarized as follows:

- Apart from Central government's role in providing policy framework, creation of a conducive legal and regulatory structure and financial support in the form of VGF, it is the state government which is responsible for enabling a socio-political-eco system in the state and eliminating constraints and hindrances at each stage so that private sector is willing and

confident to invest in a metro project in the state. State government has also to set up a competent public agency to own and execute the contract in partnership with a private operator.

- A ‘strong, capable and well organized public agency’ emerges as the most significant variable in contributing to the success of each stage of a metro project in pilot study, rated highest in opinion survey and was validated in real life case of Hyderabad metro in the first two stages of the project.
- ‘Well structured contract’ is another variable, the significance of which was evidenced in all stages of the study; exploratory research, quantitative research through pilot study and opinion survey and field study of Hyderabad metro. The findings are in agreement with world bank and United Nations (ESCAP) guidelines on PPP implementation referred earlier in literature survey which highlight the importance of public agency in taking “the steps by which PPP projects are identified, developed, appraised, implemented and managed” (World Bank,2014) and in “finalizing terms of contract, bid document, bid evaluation criteria, draft contract/concession agreement, service and output specification, mechanism for monitoring and control as well as for dispute resolution.”(ESCAP, 2011)]
- ‘Mutual trust and Good governance’ i.e. how the public agency conducts its affairs and manages the partnership and public resources for execution of the metro project is a significant factor highlighted during the study. Private sector put greater emphasis on Government support and Guarantee and Good governance than public sector in the opinion survey. The proactive participative approach followed by public agency in managing external environment in case of Hyderabad metro is an example of good governance.
- A ‘strong and competent consortium’ only can deliver a good metro system with sustainable performance. Pilot study revealed its significance during implementation and post implementations stage. Inputs from field study are pointers to the overall recognition L&T-the concessionaire for Hyderabad metro has earned for its competence in engineering, design and project management. Our validated framework has highlighted ‘effective procurement’ a pre-requisite for selection of a good consortium as a

predictor of implementation processes leading to the success of a metro project.

- 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.
- ‘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 using factors analysis and other tools to group them into significant macro factors. In our study it is interesting to note that 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’.
- Earlier studies have brought out that “social barriers can be a big hindrance to PPP projects both before and after the award of contract”. (Babatunde & et al, 2014) Social impediments can mar the success of a project. Hyderabad case study has corroborated this finding where evidence points to the role of state government in highlighting multi-benefit objectives of Hyderabad metro and creating awareness and buy-in from politicians and public at large. The findings are similar to the concluding opinion expressed by Smith & Gannon in the context of UK that ‘political support’ is the most significant success factor for light railway projects. (Smith & Gannon, 2008)
- Exploratory research and field study reveals that apart from a viability gap funding of Rs. 1458 crores the government is only committed to compensating the concessionaire for expenses incurred towards shifting of public utilities on the right of way. Similar has been the case of Mumbai metro where Mumbai city has got a metro for 30 years through government’s net spend of just Rs 400 crores These two states have achieved, through private sector participation, the construction and operation of a critical infrastructure of an urban metro system for a period of 30 years with a reduced requirement of upfront money.

- Concession agreements of the various metros studied as a part of the study brings out the fact that apart from limited upfront capital outgo, Telangana government and Maharashtra government have transferred the project construction, finance and O&M risk to the private operator. In case of Mumbai metro one, even the traffic risk is on the private operator. These two state governments have thus deleveraged their balance sheets for investment in metro systems.

## **8.6. KEY IMPLEMENTATION ISSUES:**

A few implementation issues are highlighted below based on the study:

- While most of the officials did not open up during interview on the failure of Delhi airport express line as the case is under arbitration, one of the reasons pointed out was overestimated traffic projections which were to be the basis of the main source of revenue for the private operator. While no metro system is economically viable on the basis of fare box revenue alone, other avenues are available for making its operations self-sustainable and should be explored irrespective of mode of financing, public, private or PPP.
- Another main reason emerging for the failure of Delhi airport metro is the interface issues between the public and private partners. A hybrid model where one agency is building civil infrastructure for use by other agency need even greater coordination. An analysis of situation post takeover by DMRC brings out issues tackled to make transition from Delhi metro to airport metro and vice versa which could have been implemented even when line was operated by the private operator.
- Formation of an SPV is mandatory for sanction of a metro project under 'Metro railway policy-2013' circulated by MoUD irrespective of mode of financing. Even if the project is developed by a public agency, government support in creating a conducive socio-political environment through stakeholder engagement and multi-benefit objectives and in monitoring the project and resolving implementation issues is crucial for successful completion of the project and its sustainable operation during the concession period. Importance of agency's role magnifies manifold if the project is implemented on a PPP framework. Findings of Hyderabad PPP

metro field study advocates that the state government's first and prime task is to appoint a competent person to head the public agency/SPV and empower him to select his team for executing the task. The agency has to be involved right from structuring of the project to selection of private party and monitor its implementation and operation for strict compliance.

- Mumbai metro one runs a risk of a dispute in case of handover of assets as per a report of World Bank which has found concession agreement lacking in specification to address this risk. Manual of Specifications was an integral part of Hyderabad Metro and has been hailed by both public and private officials in facilitating implementation. This can be used by other cities for implementing metro systems in their cities on PPP framework to avoid such risks.
- Jaipur metro is struggling with the operation of first phase and has decided to handover operation and maintenance of both first and second phase to a private operator once the second phase is ready for commissioning which itself is facing budgetary constraints. There is nothing wrong with this approach. However during interview with researcher, officials confessed that there have been a series of interactions with planning commission and Hyderabad metro officials and they are convinced that the second phase should be developed on a PPP framework like Hyderabad metro. However, a proposal to include property development in the concession agreement is not moving forward for want of political will. There is need 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 creation of the right of way for the viaduct of the Hyderabad Metro posed a major challenge as the proposed route passed through populated areas of the city. Similarly, in case of Mumbai metro one, there was a delay in obtaining approvals for the over bridge that passed over the railway line from the railway authorities. obtaining permission for a The delay in obtaining right of way and necessary permits for the project resulting in the delay in the start of the project has been a major source of discord and blame game between private and public agency in Hyderabad metro. As a suggested approach, future projects may consider obtaining 50% or more

right of the way and all necessary permits before the appointed date. A further clarity in the concession agreement on what constitutes right of the way for constructing a metro corridor will help avoid such situations in future projects.

## **8.7. CONCLUDING REMARKS**

The learning from the Pilot Study, Opinion Survey and SAP-LAP field study as well as insights gained from Literature Survey have been synthesized in this chapter. Key implementation issues have been highlighted to be considered in future implementation of metro projects. Next chapter presents the major conclusions of the study.