

## **SAP LAP STUDY OF HYDERABAD PPP METRO**

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### **7.1. INTRODUCTION**

A PPP metro project is a large and technically and administratively complex project in terms of the activities bundled into long term contractual arrangements and the number of players involved. Experience with metro lines constructed and operated on a PPP framework in various parts of the globe has demonstrated that public private partnerships in such projects get influenced by a variety of factors, both internal and external. Political and stakeholders' support as well as well structured robust concession agreement are crucial to success of such a project. In this context, outcome of Hyderabad metro is keenly watched as nowhere in the world a metro project of such a magnitude has ever been attempted on PPP framework. This chapter presents a practical application of CSFs identified through literature survey, validated and clustered into macro CSFs through statistical analysis as detailed in previous chapters. The case study has been attempted using SAP-LAP framework to analyze the identified CSFs in real-life settings of Hyderabad metro. Key players working on the project were interviewed during a field study to gather feedback on actions they took on factors critical to success. Observations and findings have been synthesized as learnings for future such projects.

### **7.2. METHODOLOGY**

Chapter-2 gives a brief on SAP-LAP methodology and review of its application to various management problems and to projects by earlier researchers. A case study of Hyderabad PPP metro has been attempted using "SAP-LAP framework (Situation, Actors, Process, Learning, Action and Performance)" (Sushil 2001).

The situation during bidding and contract stage and during implementation of Hyderabad metro project have been analyzed in the context of identified critical success factors. Along with situation, elements pertaining to actors and processes were also defined. A semi-structured questionnaire was used to explore their interplay in influencing the role of various CSFs as

the metro project progressed from concept to implementation stage. (Key questions - Exhibit-3) For this study, different actors involved in implementation of Hyderabad metro were personally interviewed. The criteria for choice of respondents was direct involvement in metro project execution at middle or top level with total 15 years of experience and minimum 5 years of domain experience. The exercise makes an attempt to understand “a person’s viewpoint as he gains experience in a project and understands its nature, components and their inter-relationships, etc”. (Leedy, 1977). Managers when asked questions relevant to their ongoing project work are more willing and forthright in offering their views. (Saunders, 2007) The interviews were conducted with six senior officers involved in execution of Hyderabad metro, three from government side and three from private sector with each interview lasting from half an hour to one hour. A verbatim transcript was prepared immediately after the interview based on detailed notes taken during the interview.

The SAP-LAP linkages framework for this study was developed by making specific enquiries related to the role of critical success factors in influencing situations and deployment of processes by actors for desired outcomes. A 5-point Likert scale has been used with an average of these responses calculated to determine the values in the assessment matrix. Thereafter, the observations are analysed with the help of SAP-LAP methodology in order to finally arrive at the results. Three types of matrices were developed in SAP-LAP linkages framework, i.e. assessment matrices, self-interaction matrices, and cross-interaction matrices. The assessment matrix was used to gauge the overall state of the elements of the framework, while self-interaction and cross-interaction matrices were used to depict the inter-relationships among the elements of SAP-LAP.

The interplay and synthesis of SAP led to Learning-Action-Performance (LAP). Based on the performance triggered by SAP, learning and action were worked out on the fronts of situation, actor and process. Depending upon the effectiveness of such actions on factors of situation, actors and process, performance was assessed/visualized in terms of improved processes/actors and better situational parameters.

### **7.3. HYDERABAD METRO- A BRIEF DESCRIPTION**

Twin city of Hyderabad-Secunderabad is an example of a modern Indian city which has acquired a reputation of a global city and has become one of the choice destinations for international majors in information technology. The city spans over an area of more than 650 square kilometers with population close to 6.8 million plus another million residing in its periphery as per 2011 census. Going by the pace of its growth fuelled by knowledge economy, its population will soon cross a billion mark.

Civic authorities have been augmenting infrastructure to support the industrial growth. The road infrastructure has been strengthened in the city with a number of flyovers and road junctions with green landscape which included flyover at busy Rajiv Gandhi Circle. An 8-lane outer ring road extending to 158 kilometres , providing city connectivity to airport and to highways with one km on both sides developed as green corridor was built at a cost of approx `7000 crores with approx 50% soft loan from Japan International Cooperation Agency (JICA). This project is an excellent example of how Indian cities can unlock land value for financing the infrastructure requirements of growing population and also facilitate transit oriented development for easing chaotic traffic situation.

Realizing that the cities vehicular traffic is growing out of proportion, GoAP in 2003 in collaboration with Indian Railways set up a sub-urban railway system with 27 stations over a distance of 43 km. However, MMTS had its own limitations in terms of coverage and speed and the state government wanted to go for a rail based rapid transit system.

GoAP got several studies done by various agencies in the decade from 1985 to 1995 as mentioned in S.No.3.6 above before finally accepting DPR done by DMRC for three metro rail based corridors for a total line length of 71.16 km.

The state government also decided to build the metro system on a PPP framework and remained firm on the decision even after failure of first attempt to award the contract. Finally the contract was awarded to L&T consortium on DBFOT basis.

The Hyderabad metro project has the distinction of the first metro project in the world where 72 km metro line is being developed at a stretch on

a PPP framework. The project is also the first PPP metro project in India based on the model concession agreement developed by planning commission and also the first PPP metro project which includes property development under the concession agreement as a significant source of non-fare box revenue for the consortium partner. While Chapter-3 gives a brief background of Hyderabad metro and how the risk allocation and risk management compares with other two Indian PPP metros, the field study of how CSFs are relevant to an ongoing Indian PPP metro is presented in ensuing paragraphs.

Like any other project, this project also has a situation to manage, actors to deal with the situation and the processes followed to respond to the situation. This exploratory study establishes critical success factors for the success of a PPP metro and uses SAP-LAP framework to study how well the public and private partners have handled these challenges in implementation of Hyderabad metro.

#### **7.4. SAP-LAP ANALYSIS & SAP-LAP LINKAGES FRAMEWORK**

The SAP-LAP methodology and linkages framework with steps for developing the same have been explained in Chapter-2. “The basic framework of SAP-LAP has been enhanced to dynamic SAP-LAP that analyses the situation, actor and process in a dynamic sense over different phases; the most popular application is pre and post analysis”. (Sushil, 2017) For example, the pre-contract award SAP and post contract award SAP.

In this study, SAP-LAP framework has been developed by defining the SAP elements and exploring how these elements have unfolded in the case of Hyderabad metro.

As explained in Chapter-2, there are three different stages in a PPP contract; pre-implementation or before the award of the contract, implementation or post award of the contract and post implementation. In order to enable dynamic evaluation of SAP (situation, actor and process) over different phases; two situations- before the award of the contract and after the award of the contract during implementation have been analyzed. (The third stage i.e. post implementation can be analyzed only after commissioning of Hyderabad project). Key actors or role players in the conceptualization and

implementation of metro project were identified and elements with respect to processes deployed were defined. A questionnaire was structured to discover the role of various factors both before the contract stage and during implementation of the project and how various actors have played their role in deployment of processes for the progress and success of the project. For this purpose, different actors who had direct involvement in metro project and working at a fairly senior position meeting domain experience criterion were asked to give their assessment of the significance of various CSFs in the unfolding of events during both the situations.

Selected key actors were interviewed and the average of value of responses was used to construct an assessment matrix using a 5-point Likert scale. SAP-LAP methodology was then applied to study the resultant matrix and the observations made thereof. Assessment matrix for situation, self-interaction matrices for actors and processes, and cross-interaction prioritised actor-process cross interaction matrix were developed, Qualitative evaluation of experts was used for development of assessment and cross interaction matrices. Self-interaction and cross-interaction matrices depict the inter-relationships among SAP elements.

The interplay of critical success factors and synthesis of SAP highlighted learnings and also the actions taken or could have been taken in terms of improved processes/actors and situational parameters for achieving enhanced performance.

## **7.5. ASSESSMENT MATRIX**

According to Dr Sushil, “assessment matrix considers the multiple situation and contexts with qualitative and quantitative measurement” (Sushil, 2009). The assessment matrix developed for situation categorised factor wise and also before and after the contract stage is given in Table-7.1 with ratings on a five point scale.

## **7.6. SELF-INTERACTION MATRIX**

The relationships among the various elements of SAP-LAP framework is presented in self interaction matrices; i.e. a binary and interpretive matrix. The relationship shown is in binary fashion where a value of 1 means two elements in a component are interrelated; otherwise 0 is allocated. An interpretive self-interaction matrix has also been developed to depict the nature of relationship.

## 7.7. SITUATION

The situation of Hyderabad metro project is characterized into contract stage and implementation stage (Table-7.1). While the implementation of the project is going on, post implementation situation can be analysed only after the project is commissioned and operated for sufficient duration.

In any project, "Situation" is both external and internal. In case of Hyderabad metro, examples of external situation variables are political/social environment and financial market availability. Similarly, transparent and competitive bidding process, good governance etc. are representatives of internal situation variables.

### 7.7.1. SITUATION DURING PRE-BID AND CONTRACT STAGE :

To cope up with growing traffic and to reduce road congestion GoAP decides to examine the feasibility of a metro system as Multi-Modal Transport System (MMTS) set up in 2003 in partnership with Indian Railways was proving to be inadequate because of limited area coverage and low speed.

**Table 7.1 : Assessment Matrix of Situation - Factor Wise Analysis on Five Point Scale**

Macro CSFs	Situation during pre-bid and contact stage	Situation during implementation
Socio-Political-Environment	GoI's infrastructure thrust and encouragement to PPP through policy support has created awareness among planners and public about the benefits of solving infrastructure issues with	During implementation, the division of state took place and the city came under Telangana state. After initial apprehensions the new state supported the

	<p>private participation.</p> <p>GoAP has supported metro project on PPP basis even after failure of first attempt. The project continued to get state support despite change of government/leadership. While the public at large supported the project as a solution to city's traffic congestion, there were some opposition from affected/displaced persons and vested groups on the matter of alignment etc.</p> <p>Several rounds of discussions and consultations with various stakeholder groups and public representatives were held. The relevant information was shared with the public through media statements and by conducting workshops, etc. The authorities also held in-depth discussions and consultations about the proposed project with MPs, MLAs and senior officers of city corporation as also with the general public. The elected representatives were shown DMRC operations at Delhi and were explained the salient features of Hyderabad Metro Rail Project. Extension of 3rd line by 4.77 km was to take care of the serious objections of Osmania university for 77</p>	<p>project but remained apprehensive about a small stretch of 5 KM running through assembly and heritage buildings. (Yet to be resolved).</p> <p>New Government took over at the centre. In 2014 which has initiated several economic reforms. Economy has been stable and growing. GoI also put in a strong word to the new state government not to jeopardize the project with new conditions.</p> <p>The metro system is being constructed with built in features for multi-benefit objectives for all the stakeholders. Green plantation, sky ways for pedestrians, bus-bays and auto-bays beneath the metro rail stations, exclusive women metro rail stations, and seamless intermodal connectivity apart from TOD around metro stations and depots.</p>
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	<p>acres of land acquisition for depot</p> <p>Hyderabad metro system has been designed to provide access to faster, reliable, safe and affordable means of transportation thereby enhancing city's productivity. It will also improve city's environment by reducing fossil fuel usage and congestion making a city liveable for all stakeholders.</p>	
	5	4
<p>Stable economics &amp; Institutional framework</p> <p>macro- &amp; legal</p>	<p>DPR prepared by DMRC proposed an SPV structure for implementation of Hyderabad metro on the lines of Delhi metro. DMRC further recommended that Board of SPV should be delegated all the powers for implementation the project. SPV should be headed by a Managing Director with full authority for decision making in routine matters.</p> <p>The A.P. Municipal Tramways (Construction, Operation &amp; Maintenance) Act 2008 was introduced to incorporate the rights, functions and powers of the tramway operator. The Act empowered government to take up guided mass rapid transport systems with a legal cover.</p> <p>A consortium of ten banks</p>	<p>GoI introduced Metro Railways General Rules, 2013 for regulating the operations and maintenance of Metro Railways in India under Metro Railways (Operation and Maintenance) Act, 2002 (60 of 2002).</p> <p>As the new metro act is silent on a PPP model, there is some ambiguity over the ownership of Hyderabad Metro project. Both state government and L&amp;T have requested GoI for an amendment to rectify this situation.</p> <p>{ During budget speech presented in parliament on Feb. 1, 2017 Finance Minister announced that a new Metro Rail Act will be enacted by rationalizing the existing laws which will facilitate</p>

	led by state bank of India provided the debt component of the project including real estate development facilitating financial closure within the stipulated time.	greater private participation and investment in construction and operation. (Budget,2017-18)}
	5	4
Government Support	GoI, planning commission and state government have supported the project through VGF and help in finalizing MCA, VGF and other approvals and clearances.	There have been resistance and court cases from NGOs and interested groups on various issues related to the award of contract, real estate, alignment etc but HMRL with the support of government has been able to successfully overcome these hurdles and moved ahead with the project.
	5	4
Good Governance	The processes followed for conducting a techno-economic feasibility report, stakeholder consultation, pre bid conference and award of the project demonstrate principles of good governance	While implementation hurdles resulted in some discord between concessionaire and public authority, by and large faster decision-making and good governance, led to streamlining of policies and practices, protocol for joint meetings, quality assurance, role clarity and good inter-relationships.
	5	4
Effective Procurement	While the first attempt to award the contract fell through, the 2 <sup>nd</sup> attempt	HMRL, a government agency has a member on the board of L&T

	<p>achieved its objective of selection of a competent and strong consortium as preferred bidder. The authorities adopted a transparent and competitive two stage bidding process with single bidding parameter in the form of amount of VGF quoted by the bidder. The contract was awarded to L&amp;T which is a reputed leader in project management in India. The party achieved financial closure within the stipulated time.</p>	<p>Hyderabad metro, the concessionaire to participate in decision making processes. The government nominee on board also has a golden share with veto powers. All drawings for implementation in conformity with manual of specifications are submitted in advance to HMRL which are checked by a panel of experts before approval.</p> <p>The concessionaire has introduced several design and engineering innovations and novel methods of project execution e.g. PSC segmental method of construction. It has not only been able to optimize on space and scale but also secured competitive rates for many packages through successful negotiations with vendors.</p>
	4	5
Well Structured Contract	<p>Contract was awarded on DBFOT basis. A robust model concession agreement (MCA) was drafted in collaboration with planning commission and shortlisted bidders as also Manual of Specification for the metro. Together they constitute a complete PPP agreement with defined</p>	<p>When the new state government wanted a change in alignment it soon realized that risk of change of scope is with government and can be done only at its cost. The contract keeps government and bureaucratic interference at arm's length. Difference however</p>

	<p>roles and responsibilities and penalty for defaults.</p> <p>Revenue risk has been mitigated by a) freezing fare escalation formula insulating it from public and bureaucratic interference b) including property development rights in concession. Land acquisition risk has been mitigated by earmarking government land for the major requirements of the project. Financing risk and risks associated with project, O&amp;M etc are transferred to the private operator and traffic risk is shared with the government.</p>	<p>exists between public and private party on interpretation of certain terms e.g. .ROW</p> <p>While the project may incur losses in the initial years, real estate development rights with mixed land use will help the concessionaire earn revenues once the commercial activities start gathering momentum on account of TOD and connectivity. During the implementation of the project, the state was bifurcated. L&amp;T claims that the division of the state has put a question mark on the financial viability of the project which hinges on real estate revenue. Only when the project is completed the impact in terms of the revenue flows will be known.</p>
	5	4
PPP Implementation Processes	<p>A detailed DPR was prepared by DMRC for all the three corridors where ROE &amp; IRR including 40% VGF and without property development were indicated as 14.36% and 11.36%. The economic benefits namely, reduction in commuters' time, pollution, fuel consumption, accidents, vehicle operating costs and increase in vehicle speed,</p>	<p>There have been some conflicts between the public and private agencies on certain issues during implementation. However, by and large good governance, role clarity, shared authority and commitment resulted in establishment of procedures and protocols that resulted in good decision making process and good working relationships.</p>

	<p>reliability and safety of journey along with economic attractiveness of city and improvement in quality of life were evaluated. The IRR for the estimated benefits from the project was calculated using DCF at 25.6%</p> <p>Manual of Specification and monitoring by Independent Engineer is integral part of the contract.</p> <p>MCA defines obligations and responsibilities of both concessionaire and government and provides for damages in case of default. The roles and responsibilities of both the partners are defined in MCA</p>	<p>Louis Berger has been appointed as independent engineer and monitors project performance which is reviewed jointly by private and public authority. A long duration of concession period enables concessionaire to procure quality systems and equipments with life cycle costs in mind.</p> <p>Process of coordination with some civic agencies e.g. traffic police resulted in delay in start of the work due to failure to agree on traffic diversion route and the responsibility for providing the same.</p>
	5	4
Total Score	34	29

GoAP entrusted the job of preparing a feasibility study for a rail based mass rapid transit system to DMRC which has proved its credentials in successful construction and operation of a metro system in Delhi at par with international standards.

DMRC, submitted DPR for three corridors and later for extension of 3rd corridor by 4.77 KM taking the total length of metro line to 71.16 Km. The proposed metro was to be entirely elevated. The estimate for the project cost was ` 6387 crores.

The third line extension had to be resorted to in view of representations from students and authorities of Osmania University for proposal to construct a depot on the university land. Realignment led to total line length going up by

5 Km to Nagole so that a depot can be constructed on the nearby government land. (DMRC, 2007)

DMRC proposed an SPV structure for implementation of Hyderabad metro on the lines of Delhi metro. DMRC further recommended that Board of SPV should be delegated all the powers for implementation the project. SPV should be headed by a Managing Director with full authority for decision making in routine matters.

For the legal cover, the project report advised state government to enact a Metro Act which should cover all aspects of Metro rail system including construction, operation, maintenance, land acquisition etc. The metro act should also provide for safety certification by the Commission of Railway Safety etc.

GoAP formed an SPV, Hyderabad metro rail limited with Mr N V S Reddy who had worked along with Mr E Sridharan in Konkan railway project as managing director and chief secretary of the state as chairman.

Because of the high cost, the state government decided to award metro project on DBFOT basis. Since a model concession agreement was not available for metro rail, a model concession agreement was prepared by planning commission where Mr N V S Reddy coordinated with Dr Haldea, an expert in PPP projects who had prepared model concession agreement for roads and airports. Along with MCA, a manual of specifications and standards was prepared to define deliverables in output terms.

The bids were issued and Mytas led consortium was selected as the preferred bidder who however failed to arrange the Performance Security and to achieve the financial closure for the project. In the second round of bids, contract for Hyderabad metro was awarded to L&T on DBFOT basis. The concessionaire formed SPV namely L&T Hyderabad Metro Limited and achieved financial closure within the stipulated time.

### **7.7.2. SITUATION DURING IMPLEMENTATION STAGE**

As with any project, Hyderabad metro also received opposition from displaced persons, traders and other interested groups. There were demands for change in alignment so that fewer commercial and residential buildings would be affected. General criticism was why the metro rail authorities cannot

build an underground corridor so that the project does not affect city life. Apprehensions were expressed on the likely damage to heritage buildings and assembly. Interested groups and local politicians tried to politicize the issues.

The start of the work was delayed on account of giving right of way which was the responsibility of the government or the public agency. Hyderabad city has narrow congested roads. Creating right of way by diversifying busy traffic was herculean task. The plans for traffic diversion submitted by concessionaire were not accepted by police authorities. There were differences of opinion on what constitutes right of way under the contract. Right of way for metro corridor and right of way for construction of metro corridor are two different things. It was a good decision to start from the outer skirts where the problem was not so acute because of lesser traffic and wider roads. The start of the project was also delayed on account of delay in obtaining permits.

In the meantime division of state took place and Hyderabad came under the jurisdiction of Telangana government. The new regime was having reservations about the project especially on elevated corridors in city's old area. L&T which was already voicing concerns on the viability on account of cost and time overruns and claiming that division of state has affected its potential revenues from real estate, threatened to walk out. State government changed its stand when GOI intervened and on realisation that any change in scope will be at the cost of the government. The state was also apprehensive about the negative publicity that would be generated for the state's economic climate in case the project is stalled for lack of government support.

L&T, the concessionaire has filed for damages on account of delay in project due to government's fault which has resulted in loss of productivity and idle manpower resulting in claims from their vendors. HMRL and state government has however disputed the claim.

The project is progressing and L&T is planning to commission in phases. However, because of certain reservations in government quarters on the safety of heritage structures, the work has been stopped at assembly and nearby areas pending final decisions.

The project is scheduled for commissioning by July, 2017. While in public the authorities maintain that the project is as on schedule, there are apprehensions that project might be delayed by more than a year.

## 7.8. ACTORS

An "actor" can be individual manager, or group, or department. In case of Hyderabad metro, there were many actors associated with planning and structuring the project and its implementation on a PPP framework. However, importance of the roles these actors play and responsibilities entrusted to these actors varied across various stages of planning and execution of Hyderabad metro project.

**Table 7.2 : Self interaction Matrix of Actors**

0	0	1	0	1	A1
0	0	1	1		A2
0	0	1			A3
1	1				A4
0	A5				

A6

### Interpretive Matrix

		Knowledge Sharing, information support		Policy & Clearances	A1
		Reporting	Administrative Support		A2
		Coordinator Champion			A3
Owner Coordinator/ Gatekeeper	Team Work				A4
	A5				

A6

### LEGEND

A1	Government of India
A2	State Government
A3	City & Utilities Authorities
A4	HMRL-Public agency
A5	L&T Metro -the concessionaire
A6	Public, NGOs and Other stake holders

The actors in Hyderabad metro are central government, state government, civic bodies, Hyderabad Metro Rail Limited, the public agency or SPV formed by the state government, L&T metro limited, the concessionaire or the SPV formed by the preferred bidder and public or other stakeholders. Self interaction matrix of actor is given in Table-11.2.

## 7.9. PROCESS

The "process" is the expected/desired outcome of a series of actions or in other words it is the process of converting inputs into outputs to achieve a

**Table 7.3 : Self interaction Matrix of Process**

1	1	0	1	1	P1
1	1	1	1		P2
1	1	1			P3
1	1				P4
1					P5
					P6

### Interpretive Matrix

Information Flow	Information Flow		Information Flow	Information Flow	<b>P1</b>
Facilitates	Supports	Supports	Facilitates		<b>P2</b>
Facilitates	Information Flow	Facilitates			<b>P3</b>
Facilitates	Facilitates				<b>P4</b>
Facilitates					<b>P5</b>
					<b>P6</b>

P1	DPR & Techno-economic feasibility and thorough cost benefit analysis
P2	Competitive and transparent procurement process
P3	A Robust concession agreement with proper risk allocation and sharing
P4	Good Governance, effective coordination and shared responsibility by public agency
P5	Develop MSS, appoint independent engineer and monitor contract compliance
P6	Technically and financially competent concessionaire achieves financial closure and executes the project

result. The processes could be of various types such construction process, stakeholder management process, innovation process, investment process, performance management process, operational relationship within organizations and/or with partnering organization and so on. “Trust is the binding cement of all relationships”. While it is more of a cultural aspect of institutions and organizations, a thorough understanding of role and responsibility of partners, shared authority between public and private parties, commitment of both parties to the project and principles of good governance promote mutual trust. A set of processes deployed by the actors from conceptualization to implementation stage of Hyderabad metro have been identified for the present study and are shown along with self-interactive matrix and its interpretive matrix in Table-7.3. As can be seen from the matrix, the choice and deployment of PPP processes which include stakeholder engagement, techno-economic feasibility and competitive and transparent procurement process during pre-contract stage and design, technology selection and construction processes deployed by a competent and capable concessionaire as well as partnership management process during implementation of the project have found most prominent place in the perception of respondents.

Good governance and how well the PPP project has been structured are next variables contributing maximum to the success of a PPP program. Governance matters in project implementation. Institutional and legal framework, establishing procedures and processes to be followed in execution of a metro project are crucial to the success of a PPP metro project. Equally important is the support extended by government bodies not only in smooth progress of the project but also in garnering citizens and stakeholders buy-in.

#### **7.10. PRIORITISED ACTOR MATRIX**

The binary actor process matrix (Table-7.4) maps the roles played by various actors in a specific process. However, significance of roles played by different actors varies from process to process. The prioritized actor process matrix for Hyderabad metro reveals that in initial process of carrying out DPR and techno economic feasibility of the project state government has played

**Table-7.4 : Prioritized Actor Process Matrix**

	1 A	2 A	3 A	4 A	5 A	6 A
<b>P1</b>		***** *				
<b>P2</b>	*	***		*****		
<b>P3</b>	*****	****		****		
<b>P4</b>		**		*****		
<b>P5</b>	**	***		*****	**	
<b>P6</b>		**	**	****	*****	*

**Interpretive Matrix**

	A1	A2	A3	A4	A5	A6
<b>P1</b>		Developing techno-feasible solution				
<b>P2</b>	Policy	Owner		Coordinator Champion		
<b>P3</b>	Policy & Clearances	Guidance & Support		Coordinator Champion		
<b>P4</b>		Policy & Support		Owner coordinator		
<b>P5</b>	Guidance & Support	Guidance & Support		Monitor	Reporting	
<b>P6</b>		Administrative support	Support /Collaboration	Team Work	Project Executor	Watchdog / Nuisance

major role. (Stars in prioritized matrix show the significance of roles played by different actors in an identified process) State government was the main driver for conceptualizing and implementing a metro project on PPP framework and including real estate development as a means to augment the revenues, the first in a PPP metro in India. Central government gets credit for fully supporting the idea. It not only provided its share of Viability Gap

Funding (VGF) and necessary approvals but planning commission also helped in drafting model concession agreement and manual of specifications.

The role of a competent, efficient and proactive public agency has emerged as the most crucial denominator in implementation of Hyderabad metro PPP project. HMRL, SPV created by State government has been involved right from the beginning. Its MD, Mr N V S Reddy has played a prominent role in finalising model concession agreement in coordination with planning commission. His another major contribution has been in formulation of a manual of output-based specifications in collaboration with railway and other technical experts that would provide the private sector with more flexibility for value addition and optimise costs by innovating in design and engineering in a way normally not available under conventional input-based procurement.

As for as process of risk analysis and proper risk allocation under the contract is concerned, different agencies have contributed to the process but again the major role has been played by the public agency, HMRL in identifying the risk and allocating it to the agency which is best placed to handle the risk.

The private concessionaire, L&T, a reputed infrastructure player and known for its management skills has played its role in negotiating debt from consortium of banks, achieving financial closure and starting the execution of the project. While HMRL and other civic bodies (A3) have played significant role in providing ROW, shifting of utilities, widening of roads etc, the role of self help groups (A6) is rather negative by creating hurdles in execution which the public agency HMRL (A4) has dealt with a firm hand.

## **7.11. LAP SYNTHESIS**

The inter relationship of various elements of situation, actor and process and its synthesis leads to Learning-Action-Performance (LAP). A study of how the situation unfolds, roles the actors play and the processes that are deployed in a given context and analysis of outcome highlights key learnings and action points which are relevant to the case. Based on the

outcome facilitated by SAP, knowledge may be gained for desired actions to influence or alter situation, actor or process. This knowledge should also make it possible to anticipate improvement in performance in terms of better processes, improved roles of actors or situational factors through appropriate actions.

The outcome of LAP synthesis is key learning issues. They may highlight problem areas and the desired actions to overcome them to achieve the stated objectives. The specific learnings may help in scenario building as a result of alternative actions and evaluation. LAP synthesis may also result in learnings on generic issues that can be applied to similar issues in different contexts.

## **7.12. LEARNINGS**

- A metro system is required to solve city's mobility problem but huge requirements for funds for Hyderabad metro could not be met from government resources. However, private sector has the ability and willingness to undertake complex metro projects in a favourable socio-political and economical environment.
- A capable & well organised public agency is essential to structure the project and to act as an interface between government, public and the concessionaire.
- There was no model concession agreement for PPP metro
- Metro systems all over the world are not known to be financially viable purely from fare box revenue. Property development at metro stations contributes substantial part of the revenue to Singapore, Hong Kong and Tokyo metros which are few exceptions and earn profit.
- Implementation of a large and complex metro system like Hyderabad metro require close coordination between concessionaire and public authority and a decision making process reflecting principles of mutual trust and good governance.
- The contract agreement has to be complete with respect to roles and responsibilities of partners, risk allocation and sharing, methods of risk mitigation, provisions for contingency situations etc
- Transparent and competitive procurement process attracts qualified bidders. While the Concessionaire is responsible for DBFOT functions,

the primary responsibility of ensuring a world class metro which conforms to the performance criteria, technical specifications and safety standards squarely lies with the Government, the owner of the project.

- For successful implementation of a highly technical and complex project of this magnitude, political will and commitment is necessary.
- Effective coordination and fast decisions making is important among several government departments.
- Project of this magnitude will have objection, resentment, opposition from some stakeholders and may be politicised by vested interest group.
- Getting right of the way for the project is a complex process and has a potential to delay the project.
- Obtaining required permits before the appointed date is difficult in practice and has a potential to delay the start of the project

### **7.13. ACTIONS**

- GoAP appointed DMRC f
- or preparing DPR with cost benefit analysis.
- MCA was developed with close coordination with planning commission.
- State government created a SPV named “Hyderabad Metro Rail Limited (HMRL)” and delegated adequate powers for implementation.
- MD, HMRL developed a robust concession agreement in collaboration with planning commission with defined roles and responsibilities of partners, risk allocation and sharing, methods of risk mitigation, provisions for contingency situations etc. A revenue model was developed which included lease rentals and property development rights to keep passenger fares affordable.
- A reliable, implementable and pragmatic manual of specification was developed as an integral part of concession award agreement with emphasis on “performance-based outputs” rather than the conventional “input” oriented specifications, allowing for design innovations. The manual of specification formulated is technology neutral giving the choice of technology selection to the concessionaire.
- An independent engineer has been appointed for monitoring the contract compliance as per specification and standards set in the contract
- Property development rights were included in the concession to overcome the constraint of raising fare box revenue, traffic risk shared partly (by

adjusting concession period) and design, finance and project risks were transferred to the private party.

- An institutional framework was provided in the form of HRML with chief secretary of GoT as the chairman and Secretaries of MaUD, Finance and TR&B departments and top functionaries of civic bodies as directors on board of HRML for effective coordination, quick resolution of problems.
- Public awareness campaign was started to allay fears about the project and to create a positive image. Issues were dealt with a firm hand and disposed of quickly.
- To the extent feasible depots, stations etc. were planned on government land thus meeting majority of land requirements to minimise the risk of project being stalled for the reason of land acquisition from private owners.

#### ***Suggested Actions***

- 50% of the right of way should be taken in advance before start of the project
- Permits should be obtained beforehand preferably by the public agency

#### **7.14. PERFORMANCE**

- Project approved by state and central government with provision for 40% VGF.
- Hyderabad metro is the largest metro project being attempted on PPP framework anywhere in the world and has a potential of being a light house to other aspiring cities/states.
- A model concession agreement is now available which could be used by other metros in the country.
- The contract was signed within stipulated time.
- Business model based on fare box and real estate earnings found bankable and a consortium of ten banks led by state bank of India provided the debt component of the project including real estate development facilitating financial closure within the stipulated time
- The project has won “Global Engineering Project of the Year in 2013 by the sixth Global Infrastructure Leadership Forum in New York”. (Ahluwalia,2014)
- Project progressing as per specification

- A technologically advanced a communication-based train control (CBTC) system with higher degree of safety and reliability and a scalable metro system has been selected A technically and strong concessionaire with project skills was selected
- Public agency, HRML has been an effective interface between government and concessionaire on one hand and concessionaire and public on the other hand contributing to implementation success. While L&T metro did start public awareness campaign such as it was HMRL, the public agency which managed the external environment for the project with a firm hand and protected the interests of the project
- There have been delays in start of the project on account of getting ROW There was delay in start of the project on account of delay in obtaining permits

Summary of Lap synthesis factor wise is depicted in Table-10.5

**Table 7.5 : LAP Synthesis of Hyderabad Metro: CSFs Vs LAP Summary**

<b>Macro CSF</b>	<b>Learnings</b>	<b>Action</b>	<b>Performance</b>
Socio-Political-Environment	A metro system is required to solve city's mobility problem. While budgetary resources of government are limited, private sector's finance and expertise can be tapped if a right socio-political and economic environment is available/created.	State leadership supported the project on PPP framework and with decision support system and institutional and legal cover and created conducive environment for buy-in of all stakeholders.	Hyderabad metro is the largest metro project being attempted on PPP framework anywhere in the world and has a potential of being a light house to other aspiring cities/states.
Stable macro-economics & Institutional legal framework	A large PPP project has to be supported by institutional and legal framework.	State government created a special purpose vehicle named "Hyderabad Metro Rail Limited (HMRL)" and delegated necessary powers for implementation and operation of the system.	HMRL played a major role in project achieving contract stage success and implementation progress
Government Support	Both central and state governments need to support a PPP program not just through VGF but at various stages in resolving issues specific to the projects.	MCA and manual of specification was developed with close coordination with planning commission	A model concession agreement and manual of specification are now available which could be used by other metros in the country.
	Metro systems anywhere in the world are not known to be financially viable purely from fare box revenue. Property development at metro stations contributes substantial part of the revenue to Singapore, Hong Kong and Tokyo metros which are few exceptions and	The revenue model to include lease rentals and property development rights to keep passenger fares within reach of the masses.	A consortium of ten banks led by state bank of India found the business model based on fare box and real estate earnings bankable and provided the debt component of the project including real estate development facilitating financial closure within the stipulated time

	earn profit.		
Good Governance	Implementation of a large and complex metro system like Hyderabad metro require close coordination between concessionaire and public authority and a decision making process reflecting principles of mutual trust and good governance.	Set up a decision-making processes to deal with every aspect of project including streamlining of policies and practices, protocol for joint meetings, quality assurance, role clarity and good inter-relationships etc.	While implementation hurdles resulted in some discord between concessionaire and public authority, by and large decision making has been good and the private and public agency have been working in tandem for the success of the project.
Effective Procurement	Transparent and competitive procurement process attracts qualified bidders.	Followed a transparent and competitive two stage bidding process with single bidding parameter	A technically and strong concessionaire with project skills was selected.
Well structured PPP Project	The contract agreement has to be complete with respect to roles and responsibilities of partners, risk allocation and sharing, methods of risk mitigation, provisions for contingency situations etc.	Develop a robust concession agreement with respect to roles and responsibilities of partners, risk allocation and sharing, methods of risk mitigation, provisions for contingency situations etc.	The contract signed and project achieved financial closure within stipulated time.
Well structured PPP Project	Risk analysis and proper risk allocation in a PPP project is important to make the project viable and bankable	Include property development rights to overcome the constraint a of raising fare box revenue, share traffic risk partly (by adjusting concession period) and transfer design, finance and project risks to the private party.	A robust concession agreement with provisions for proper risk allocation to the party most suitable to bear that risk.
PPP Implementation Processes	Processes deployed for structuring a PPP project and for its implementation contribute most	Appointed DMRC for preparing DPR with cost benefit analysis.	Project approved by state and central government with provision for 40% VGF.

	significantly to the success of the project.		
PPP Implementation Processes	While the Concessionaire is responsible for DBFOT functions, the primary responsibility of ensuring a world class metro which conforms to the performance criteria, technical specifications and safety standards squarely lies with the Government, the owner of the project.	Specify a reliable, implementable and pragmatic manual of specification with emphasis on “performance-based outputs” rather than the conventional “input” oriented specifications, allowing for design innovation and appoint an independent engineer for monitoring the specification as per contract	In 2013, Global Infrastructure Leadership Forum, USA awarded the Global Engineering Project of the Year award to Hyderabad metro.(Ahluwalia, 2014)
PPP Implementation Processes	For successful implementation of a highly technical and complex project of this magnitude political will and commitment is necessary. Effective coordination and fast decisions making is important among several government departments	Chief Secretary of GoT is the chairman of HRML and Secretaries of MaUD, Finance and TR&B departments and top functionaries of civic bodies are directors on board of HRML for effective coordination, quick resolution of problems.	HRML has been able to fulfil most of the government obligations under the contract contributing to implementation success.
PPP Implementation Processes	Project of this magnitude will have objection, resentment, opposition from some stakeholders and may be politicised by vested interest groups.	Public awareness campaign and firm and quick handling of the issues.	While L&T metro did start public awareness campaign such as it was HMRL, the public agency which managed the external environment for the project with a firm hand and protected the interests of the project.
	Getting right of the	Land acquisition	There have been delays

	way for the project is a complex process and has a potential to delay the project.	risk was minimised by earmarking government <b>Suggested Action</b> 50% of the right of way should be taken in advance before start of the project	in start of the project on account of getting ROW
	Obtaining required permits before the appointed date is difficult in practice and has a potential to delay the start of the project.	Permits should be obtained beforehand preferably by the public agency.	There was delay in start of the project on account of delay in obtaining permits

### 7.15. CONCLUDING REMARKS

This chapter presents a practical application of CSFs. The case study has been attempted using SAP-LAP framework to analyse the identified CSFs in real-life settings of Hyderabad metro. 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.