

## **INDIAN EXPERIENCE WITH PPP METROS**

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### **3.1 INTRODUCTION**

Rail-based ‘Mass Rapid Transit System’ has gained popularity as a solution to deal with chaotic road congestion in major cities across the world. The progress in India like in many other developing countries has however been slow as metro projects are capital intensive and technologically complex and require a long gestation period. The work on Kolkata Metro started in 1972 by Indian railways, 25 years after independence and took 12 years to commence operation on a small stretch of 3.4 km. Today Kolkata metro operates 27.22 km with 24 stations and is adding another line. If we exclude Chennai MRTS which was not exactly a metro system with EMU coaches, Delhi metro is the second metro commissioned in India. While lack of budgetary resources precluded planning of such capital intensive projects, there were hardly any comprehensive city development plans addressing transport and traffic issues.

This chapter critically appraises the Indian experience with PPP metros. Mumbai metro line was the first project where Maharashtra government invited tenders on a PPP framework. In view of the need for a faster link between New Delhi city and Delhi airport before the commonwealth games, DMRC decided to build Delhi airport express line on a PPP framework and this line became operational before Mumbai metro one. Hyderabad metro became the third metro being developed on a PPP model by Andhra government. While the subsequent sections in this chapter analyze the background, stages in implementation of the project and present status of Delhi airport express line and Mumbai metro line one, the Hyderabad metro has been selected for the field study as it is the first metro project attempted on PPP framework anywhere in the world on such a large scale (72 KM metro line). The case has been studied and analyzed using SAP-Lap methodology and covered in a separate Chapter. Secondary data sources have been used that

included various contract and project documents, reports etc. and have been supplemented through semi-structured interviews of government and private sector senior executives involved in the conceptualisation and implementation of the three PPP Metros. A comparison of models adopted for various metros and risk allocation and analysis of how various risks have been handled in the respective projects for the three Indian metros is presented in tabular form. A summary of how different PPP structures adopted so far for Indian metros have helped governments to transfer economic risks and deleverage public debt. The main features of proposed draft metro bill and metro policy have been enumerated before concluding the chapter.

### **3.2 PUBLIC PRIVATE PARTNERSHIPS IN INDIAN METROS**

Delhi metro was set up as a joint venture between central government and Delhi government and its MD, Mr E Sridharan managed the entity more or less as a private company setting new benchmarks in project execution, punctuality and quality in service delivery. The success of Delhi metro has led to other metros being planned on similar model where both Union Government and State Governments hold equal stake in the SPV incorporated for executing metro project. Metro rails in most of Indian cities after Delhi that have been commissioned or are under construction e.g. Jaipur, Chennai Bengaluru, Ahmedabad, Nagpur, Kochi, and Lucknow have been funded through government resources. The same trend is seen in future proposed metros as well, e.g. Greater Noida, Ghaziabad, Pune, Vishakapatnam and Vijayawada etc. The following metro systems however have been exceptions as the same have been developed/being developed through private participation:

- Delhi Airport Metro Express
- Gurugram Rapid Metro
- Hyderabad Metro
- Mumbai Metro

Haryana Urban Development Authority (HUDA) awarded 99 year concession to Rapid Metrorail Gorgon Limited (RMGL) a special purpose vehicle incorporated by IL&FS. The concession was for construction and operation of a 5.1 kilo meter elevated metro. The line provides a link from

**Table 3.1: Comparison of Main Features of Indian PPP metros**

| <b>Description</b>                                | <b>Delhi Airport Metro Express Line</b> | <b>Mumbai Metro One Pvt Ltd (MMOPL)</b>                    | <b>L&amp;T Metro Rail (Hyderabad) Ltd</b>                              |
|---|---|--|--|
| Line/Section                                      | New Delhi-Dwarka Sec21 via Airport (T3) | Versova-Andheri-Ghatkopar corridor                         | 3 Corridors; Miyapur-LBNagar, JBS – Falaknuma and Nagole – Shilparamam |
| Length (Km)                                       | 22.7 (7 km elevated)                    | 11.4 ( Fully Elevated)                                     | 71.16 ( Fully Elevated)  |
| Stations  | 5                                       | 12   | 66   |
| Awarding Authority                                | DMRC                                    | MMRDA  | GoAP (now GoT)   |
| Party/ Consortium                                 | Reliance Infra and CAF                  | Reliance Infrastructure and Veolia Transport               | L&T and L&T Infra Proj Dev Ltd   |
| PPP Model   | BOT                                     | BOOT   | BOOT   |
| Concession Period (Years)                         | 30 Years                                | 35 (including 5 years for construction)                    | 35 (including 5 years for construction)                                |
| Project (INR, crores)                             | 5700 Party (2885) Authority (2815)      | 4321   | 12132 (Revised 14132)  |
| VGF (INR, crores)                                 | NIL                                     | 650  | 1458   |
| Concession Fee (INR,crores)                       | 54                                      | NIL  | NIL  |
| Rolling Stock, O&M                                | Party                                   | Party  | Party  |
| Date of Tender/rfp                                | Sept, 2007                              | 21.08.2004   | July 24, 2009  |
| Award of Contract                                 | 21 Jan 2008                             | 8 <sup>th</sup> Feb,2008                                   | August 6, 2010   |
| Agreement signed on                               | 25 AUG 2008                             | 07 MAR2007   | 04 Sept 2010   |
| Financial closure                                 | Oct 2008                                | Oct 2008   | March 2011   |
| Construction commenced                            | 2 <sup>nd</sup> Half of 2008            | Feb, 2008  | April, 2012  |
| Commencement of operation                         | 23 Feb 2011                             | 8 <sup>th</sup> June,2014                                  | Scheduled for June' 17   |
| Government Expenditure (INR,crores) excluding VGF | 2815 on civil infrastructure            | 134 (26%) equity by MMRDA plus 50 on shifting of utilities | 1980 on govt.land acquisition, R&R, pedestrian facilities etc.         |

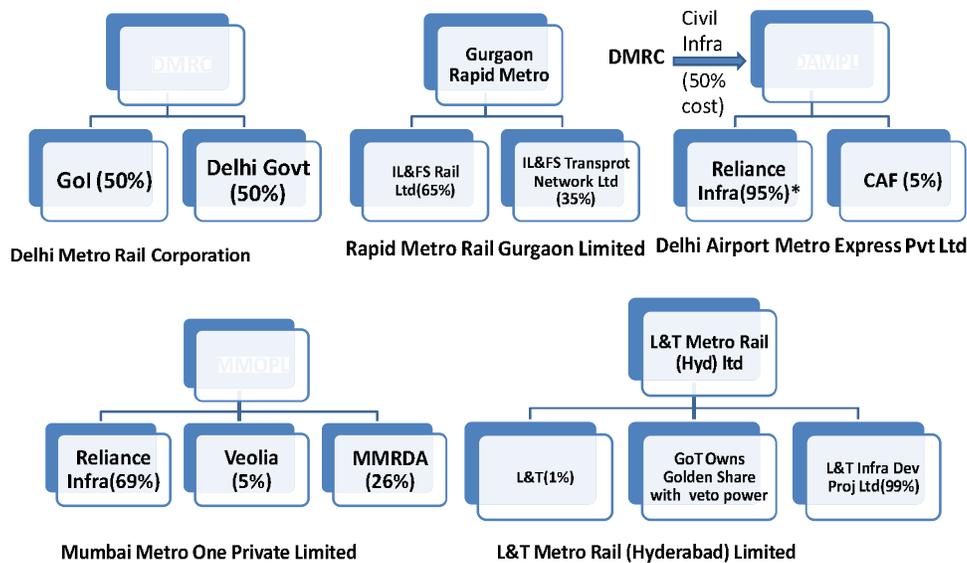
Source : Web sites of respective metros, concession agreements

Sikandarpur station of DMRC to various offices in cyber city and on NH-8 through six stations. This being a 100% private project, Gurgaon rapid metro has not been included in this study. Main features of the other three PPP metros are presented in Table 3.1

Delhi airport metro initially developed on a PPP framework was a hybrid project where part of construction was done by DMRC. This line has now been taken over by DMRC after the Reliance led consortium has walked out of the contract. Mumbai metro line one has been developed by MMRDA on a PPP framework where Reliance infra led consortium is operating 11.07 KM stretch between Versova-Andher-Ghatkopar

### 3.3 FUNDING PATTERN

Figure 3.1 shows funding pattern of different urban metros built with private participation in comparison with DMRC model of 50:50 equity by



**Figure 3. 1 : Funding Pattern of Different Indian Metros<sup>4</sup>**

central and state government adopted by most of the states. While some of the urban metros have been able to arrange soft loan from bilateral agencies, the

<sup>4</sup> Reliance infra transferred 65% shares in DAMEPL to “Spice Commerce and Trade Private Limited “in April, 2012, a group company. According to DMRC, its consent was not taken before transfer.

fact remains that public funding of a capital intensive urban metro project results in additional burden on national exchequer.

Since public partnerships in urban metro is still evolving in Indian metro rail space, it is difficult to say which one out of the four funding models adopted by four metros built with private participation in India so far is best. Each model has its own advantages and disadvantages and local context has also to be taken into account before deciding a particular model of private participation. The new metro bill and metro policy accordingly give a menu of options to states for selecting the funding pattern.

### **3.4 DELHI AIRPORT METRO EXPRESS LINE -**

Privatisation of aviation sector in India opened up the sky for private airlines including no frills airlines resulting in significant growth in air travel. Drop in air fares making them affordable when compared to upper classes in rail, ease of getting ticket even at the last minute, resultant time saving and strain of train journey motivated middle class to take to the skies in a big way. The result was long queues at the terminals and traffic congestion on roads leading to airports. Access to airports became a problem in most of the big cities and needed urgent attention especially in Delhi as Delhi airport ranked high in passenger traffic compared to other airports in the region. As there was virtually no public transport service barring a few city buses, passengers travelled from city and other parts of NCR to the airport using cars or taxis. For a small portion of workforce engaged at the airport dedicated bus service was provided such as by CISF for its employees, others were dependent on personal vehicles either cars or two wheelers.

In nineties a decision was taken to build a metro as a solution to Delhi's chaotic road traffic. A company was incorporated by the name "Delhi Metro Rail Corporation (DMRC)" to construct and operate the metro, with equal contribution to its share capital by Delhi government and union government. By 2008 the metro with 116 kilometres of operational line was commanding almost 10% share of public transport in the metropolis. DMRC started working on expansion plan to nearly 400 kilometres of metro network by the end of next decade.

Delhi metro has earned a reputation not only because of excellent project management without cost and time overrun but also because of design of station and coaches, reliability and frequency of operation which were rated at par with international standards. DMRC also was able to recover its operational costs through ridership and other revenues.

Delhi metro however did not provide connection to Delhi airport and DMRC proposed a separate express line originating from the New Delhi railway station in the heart of the city catering exclusively to airport bound passengers. Air port line was planned with six stations on a route of 22.7 kilometres with extension beyond the airport to Dwarka sector-21 to provide connectivity to city metro system.

Delhi was the venue for Commonwealth Games-2010 and there was pressure on DMRC to build and start the airport line before the big event. Since DMRC, by this time was busy in construction and operation of phase-1 and 2 of the metro network, a public-private partnership (PPP) framework was decided for operation of airport line. As the capital cost of airport line was high for any private concessionaire to recover from fares alone, a hybrid PPP model was thought of in which DMRC would build the basic civil infrastructure and the private consortium would invest in metro and enabling systems and also be entrusted with the responsibility of operation and maintenance for 30 years. The civil works was to be the responsibility of DMRC including the viaduct, tunnels and the stations.

Reliance led consortium was the successful bidder. The total project cost was `5700 crores of which Reliance led consortium, the concessionaire paid `2885 crores in addition to a concession fee of ` 51 crore, license fee and revenue share. (Letter of acceptance No DMRC/20/II-101/2006/Part II Dt. Jan21, 2008).

CAF Spain which was to supply metro coaches also took a minority stake of 5% in the consortium with rest of the equity held by lead partner Relianceinfra. A special purpose vehicle “Delhi Airport Metro Express Pvt. Ltd (DAMEPL)” was incorporated to execute the metro project in two and half years to coincide with opening of Commonwealth games in July 2010. It

was decided that the line from New Delhi station to airport will be extended to Dwarka to join DMRC's blue line to Noida and Vaishali. The airport line was to be designed with a speed of 130 kilometres per hour providing fast connectivity to airport bound passengers. MTR Corporation which operates Hongkong metro and also PPP metro in Beijing (Beijing line-4) was to work as consultant for the project. The entire stretch from railway station to airport and Dwarka was to be underground with the exception of Dhaulakuan station which was above the ground.

The line was opened on 23 February 2011 about six months behind schedule and much after the Commonwealth Games were over. The Aerocity and Dhaulakuan stations opened on 15 August 2011. The airport express metro provided a fast and convenient mode of travel between New Delhi Station to airport in 18 minutes compared to road journey of about an hour. However, operations had to be suspended just after 16 months due to technical problems related to fastening clips, bearings and grouting material. DAMEPL stopped the line in July 2012 and took up structural and track rectification work which continued for almost seven months. While the services were resumed in January, 2013, the metro was operated at lower speeds resulting in drop in ridership by fifty percent. There was blame game as to who was responsible for the technical faults. The line could be operated at 50 kilo metre per hour almost at 40 % of the design speed doubling the travel time from railway station to terminal-3 which was advertised at the time of inauguration of the line as 20 minutes. On 30 June 2013, Reliance led concessionaire walked out of the contract expressing their inability to run the operation of the airport express line and DMRC took over operations from 1 July 2013. As per DAMPEL, "it had already given formal notice of termination for its concession agreement to DMRC in October 2012. ...The termination clause had to be invoked by DAMEPL, as DMRC had persistently failed to cure the substantial defects in the civil structure designed and built by DMRC, within the period prescribed under the concession agreement.... DAMEPL had continued to operate the services after October'12, because DMRC had failed to make alternative arrangements....However, this situation could not be allowed to continue indefinitely" (DAMEPL's letter dated June27, 2013).

DAMEPL alleges that the termination of the concession agreement is on account of default by DMRC and it is entitled to termination compensation as per provisions of the concession agreement.

DMRC is operating the line since 1<sup>st</sup> July, 2013 and has entrusted the responsibility of O&M of the metro system to a separate group specially constituted for the purpose.

#### **3.4.1 SITUATION AFTER TAKEOVER OF THE LINE BY DMRC**

DMRC took several measures to improve credibility and reliability of airport express line. It restored speed to 80 kmph within a year of taking over, increased frequency of trains and introduced a number of commuter friendly features apart from slashing the fares by almost 60%. Interoperability of DMRC smart card, seamless interchange from DMRC line to airport line at Dwarka sector 21, baggage check-in facility at New Delhi station, operation of line early in morning till the late hours to suit the departure and arrival of popular shatabdi trains at New Delhi station etc resulted in increase in ridership by 60% within a year.

As a result of these measures there was consistent improvement in ridership. “On 11th May, 2015, the ridership was 26,580. Second fare reduction was introduced from 18th September, 2015 and on 5th November, 35,405 people used the line. On August 12, the ridership reached to 50,077. The increased footfall has resulted in increase in revenue both from fare and non fare. As more passengers are coming in, the land which were lying vacant are now attracting bidders. At Shivaji stadium, most of the space is out for rent,” said a DMRC official.

DMRC is also exploring how to attract more air fliers to choose this mode of travel for reaching airport. It has taken up with ministry of aviation if private airlines catering to price conscious passenger segment and operating from terminal 1D can be shifted to main terminal. Alternatively, it is coordinating with concerned agencies for extending the facility of check-in baggage from New Delhi station/aerocity metro station for passengers bound for Terminal 1 D.

### **3.5 WHY DID PPP IN DELHI AIRPORT EXPRESS LINE FAILED?**

The dispute arising on account of Reliance led consortium walking out of the PPP contract is under arbitration and full facts as to who was more responsible for the failure of partnership, DMRC or the private concessionaire, would be known only after its outcome. It is a project that needs to be analysed in detail by all the stakeholders and lessons need to be learnt, more so, because the new Metro Bill and Metro Policy are pushing for many more such projects.

“In PPP project of Delhi Airport Metro Express Line (DAME), the concessionaire had assumed a variety of risks including whether the operating system could be built on time and budget and would operate as reliably and efficiently as expected. Ridership was also a key risk since the main source of revenue for the concessionaire was the fare box revenue.” (Agrawal, Gomez, & Jose, 2012).

The failure raises many questions. Was it a case of overestimated Returns? Did both DMRC and private operator over estimate the likely returns? Should both DMRC and reliance led consortium have done more due diligence? Faced with time constraint in view of compulsion to execute the project before forthcoming Commonwealth Games in 2010, did DMRC overstate the traffic estimate at 42,000 passengers per day to make the project viable? RITES which evaluated the technical feasibility of the project is reported to have based traffic volume on the likely development of Aerocity which did not materialise. Did reliance infra miscalculate the revenue from property development?

Why was the project bid as hybrid PPP contract? A senior officer of DMRC said that structuring of project on a full-fledged PPP model would have taken 2-3 years in preparation and approval and time was a constraint in view of commonwealth games deadline. This raises another question, whether adequate care was exercised in structuring PPP framework and drafting the concession agreement.

While Reliance offered concession fee to DMRC for getting the award, L&T-GE consortium, the next bidder wanted an interest free long term debt or

annual subsidy in lieu of debt amounting to `346 crores. ICRA, an independent rating agency had raised concerns on the risks on Reliance Infra's debt, "The success of the project crucially hinges on DAMEPL's ability to execute the real estate development as planned. The real estate-related revenue would account for almost 70 per cent of total revenues in the initial years and more than 50 per cent of total revenues during the entire concession period and, hence, exposes the project to variation in real estate lease rentals in the New Delhi region. The project is also exposed to the market or traffic risks that are typical to transportation projects and to interest rate risk given that the interest on the loans would be reset at regular intervals."

Based on the available documents and reports, interviews with concerned officials as also an appraisal of events that unfolded, two important areas get clearly highlighted; structuring of the PPP project and concession agreement and lack of interface between the two partners.

A case study of Delhi metro express line prepared for Indian Railway Institute of Transport Management, Lucknow has referred to the report compiled by an expert committee constituted by MoUD to pin point the root cause behind suspension of services on the airport metro. The report states, "the top management of DMRC is also responsible for neglecting issues of overall control and monitoring of the defect in the line. The top management should have been more pro-active and more responsible for overall strategic issues such as overall coordination, timely resolution of issues and definitely of role of concessionaire." (Singh, 2013)

A working paper on framework for structuring PPP in railways by IIM, Ahmedabad also emphasises the importance of managing the interface between the concerned entities. "The concession agreement failed to recognise the vertical interface between DMRC (Contracting authority) and reliance (Concessionaire) which resulted in blame game between both the parties and finally closing of the line more than six months. The project also failed to mitigate the horizontal interface risk between DMRC and DAME, which resulted in making DAME a standalone line with poor integration with the remaining network and thus low ridership". (Gangwar & Raghuram, 2013)

Since the case is under arbitration, most of the officials from DMRC and Reliance were not willing to comment on the reasons for failure of the project during interview by the researcher.

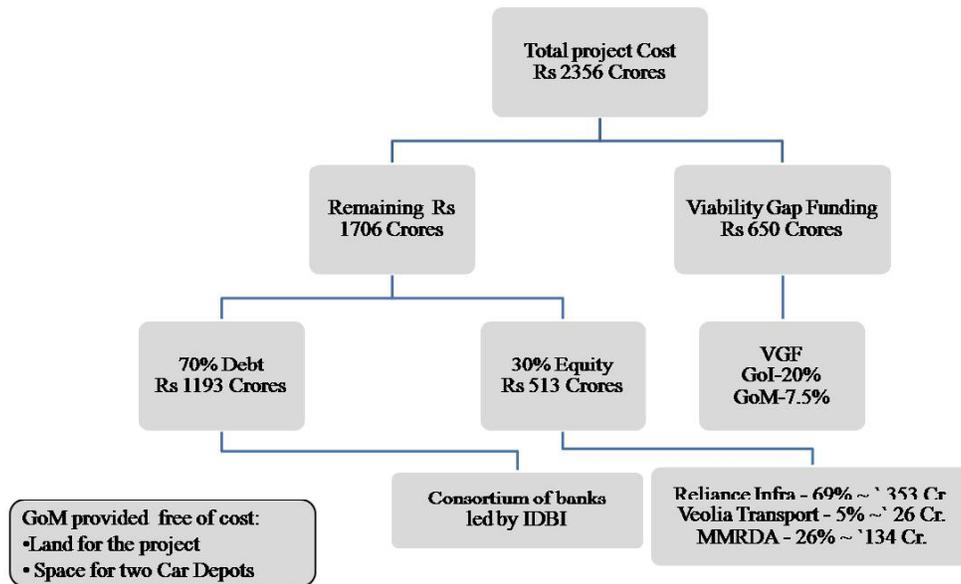
### **3.6 Mumbai Metro One Line**

In order to improve mobility in congested Mumbai in short and long term, the “Mumbai Metropolitan Region Development Authority (MMRDA)” made plans to develop a network of rail based Mass Rapid Transit System (MRTS). The first leg of this network, the “Versova-Andheri-Ghatkopar line”, was decided to be developed on PPP framework. The 11.07 kilometre elevated line was to be constructed on DFBOT basis. MMRDA also decided to keep 26% equity stake in the joint venture “Mumbai Metro One Private Limited (MMOPL)”. Reliance Energy Limited, the successful bidder was the majority partner in the joint venture with Veolia Transport holding a minority 5% equity stake.

The total project cost was estimated at `2,356 crores. The project received VGF grant of `650 crores out of which Gol’s contribution was 20% and 7.5% was contributed by the state government. Promoters brought in equity of `531crore to finance 30% of the remaining amount of `1706 crores with IDBI led bank consortium providing the balance 70% as long term debt helping the project to achieve financial closure. (Figure-3.2) Project IRR was envisaged @8% and Equity IRR 15%.

The construction commenced in early 2008. There was delay in acquiring land and MMRDA which was to acquire land and provide right of way by end 2008 could do so only by end 2011 and even this left one or two parcels of land still to be acquired as that involved shifting of places of worship. MMRDA could resolve the issues and provide 100% right of way to MMOPL only by October 2012.

There was some dispute between MMRDA and the consortium regarding the change of the name of metro line from 'Reliance Metro' to



**Figure 3. 2: Financial Structure of Mumbai Metro One**

Mumbai metro one which was finally resolved in favour of Mumbai metro one. While Reliance infra intimated that construction is complete, inspection and clearance from RDSO and Commissioner of metro rail safety was delayed with delays attributable more to administrative reasons than technical ones and the line was finally inaugurated on 8<sup>th</sup> June, 2014, a little more than six years after the award of the contract.

**Fare Dispute:**, As per concession agreement the fares at the time of commissioning of the metro were to be fixed at 2003-04 level and indexed @11% every fourth year. However, the project was brought midway under 'the Metro Railways (Operation & Maintenance) Act, 2002'. As per provisions of the act, the initial fare is decided by the designated metro rail administrator and all further increases are decided by a fare fixation committee (FFC) appointed by the central government. Since Reliance infra holds majority share in Mumbai metro one, it fixed initial fare in the range of ` 10-40 and FFC revised the current fare to ` 10-110, with a trip of 11.4-km from Versova to Ghatkopar costing ` 110, higher of the fare structure. MMRDA is

insisting that initial fare structure should be ₹9-13 as against ₹10-40 as per the original contract. MMRDA has gone to high court which has stayed the fare hike. The matter is yet to be decided. Mumbai metro one site under 'fare' mentions two sets of fares a) "Fare fixed by MMOPL under Section 33 of the Metro Railways (Operation & Maintenance) Act, 2002 on recommendation of First Fare Fixation Committee vide FFC's report dated 8 July 2015" (₹10-110 and then lists the applicable fares (₹10-40) under 'discounted fare'".

A Qualitative Vfm analysis done in a World Bank study has brought out factors that have resulted in value creation for Maharashtra government when compared to public funded similar projects which are briefly discussed below:

- **Substantial savings of government finances**-making the project 'off balance sheet' for the state government. Apart from VGF of ₹650 crores, government's expenditure in shifting of utilities etc is estimated at ₹50 crores. Against this, likely tax earnings from the project would be around ₹300 crores. Thus an infrastructure facility worth ₹2300 crores has been created with government's net contribution of ₹400 crores.
- The cost of the project at US \$ 44 million/per km (approx ₹264 crores/km) compares favourably with other international projects including Delhi metro.
- **Transfer of major project risks to private operator.** In Mumbai metro one all project risks e.g. investment risk, project execution risks, O&M risks and also the marketing risks were completely transferred to the consortium. While advertising and some sort of commercial activities are allowed, fare-box revenue constitutes major portion of earnings for the private operator who has assumed major risk of traffic falling short of projections. Maharashtra government has not assumed any responsibility for lower revenue on account of rider ship not meeting the forecasts, no compensation to private operator on this account is envisaged in the concession agreement. Bundling of construction and O&M for 35 years ensures that it would be in the interest of

the operator to create reliable infrastructure and build sustainable operational and maintenance practices.

The study has also highlighted key learnings of the project as follows:

- a) Bid process took more than 2 years. Longer the bid process lesser would be the interest in the market for bidding for the project.
- b) Since there was no model concession agreement available for metro system, the available model concession agreement for highways was customised for Mumbai metro which took considerable time resulting in finally only one party remaining in the fray. Delay was also on account of VGF approval which could have been expedited.
- c) Procedural and administrative delays are the main culprits in upsetting the schedule of a project and have the potential of completely derailing it. For example, railways inordinately delayed permission for construction of a bridge over a railway line. Acquiring land for the project is the most time consuming process often fraught with long drawn legal disputes. In the extant case while there was delay in acquisition of private land for the depot, successful negotiation by state agencies finally resolved the issue.
- d) The specifications under the concession agreement could have been more specific and detailed to avoid any possibility of dispute at the time of hand over of the assets after the concession period.
- e) While the public agency, MRDA was able to garner public support during project execution, the project got delayed on account of land acquisition and road widening.
- f) ***Role of Good Project Preparation:*** The fact that bid price could be reduced by almost half through negotiation points to the need for preparation prior to the procurement

### **3.7 HYDERABAD METRO**

Hyderabad city has been growing and with increase in population, city's traffic which is predominantly road based with reliance on auto rikshas and privately owned passenger vehicles such as two wheelers and cars, is

becoming more and congested. Traffic jams and long commute times are more of a rule than exception. In 2003 GoAP in partnership with Indian Railways set up Multi-Modal Transport System (MMTS) which is basically a sub-urban rail system covering a distance of 43 km and 27 stations. While MMTS did register increase in ridership gradually and succeeded in providing access to citizens to inner and busy parts of city thereby reducing demand on road system and easing congestion, it had its limitations in the form of low frequency during off peak hours and holidays, limited area coverage and low speed. A fast growing city which is a hub for IT and BPO services needed a faster, reliable, safe and affordable mass rapid transit system and rail based metro system was the obvious choice of GoAP.

GoAP during the period 1985 to 1995 had got various studies done by several agencies including RITES, IL&FS and Japan Trade External organization for LRT corridors and finally engaged DMRC to carry out a feasibility study for a rail based mass rapid transit system. 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.

GoAP decided to implement metro project on a PPP framework. A model concession agreement was prepared along with manual of specifications and standards and a transparent and competitive bid process was followed. The first round of bids fell through when Mytas led consortium, the selected bidder 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.

Construction and operation of a metro on PPP framework is a huge project technically and managerially complex involving number of parties in transactions and several activities bundled into the contractual arrangements. As has been learnt from successful and not so successful PPP metro projects across the globe, there can be several issues impacting the successful implementation of public private partnerships. In fact, a project of this

magnitude has not been attempted anywhere in the world so far and hence the world is keenly watching the progress of Hyderabad Metro. A detailed field study on Hyderabad Metro was carried out based on SAP-LAP methodology and is presented in Chapter-7.

### **3.8 RISK ALLOCATION AND RISK MANAGEMENT IN INDIAN PPP METROS**

A Public-Private Partnership (PPP) is a contractual arrangement between public entity and a private party for creating a facility or delivering a service to the public. For the success of a PPP project it is imperative that there is proper risk allocation between the parties with each party assuming the risks that it is in a best position to manage.

In a metro project on PPP framework, the public agency normally assumes the project structuring risk establishing technical and financial feasibility and obtaining stakeholder buy-in and political commitment to the project. The private sector is usually assigned the financing, construction and O&M risks. A comparative table of how various risks have been handled in the three PPP metros in India is presented in Table 3.2.

Key features of risk management in public private partnerships in Indian metro include the following:

- The government or public agency remains responsible for service delivery while being able to appoint a private consortium to deliver the service either by providing appropriate assets or concession to build those assets under agreed level of performance and service delivery, rewards and risk transfers.
- Responsibilities and the obligations of private and public agencies are governed by concession agreements and include pain and gain sharing provisions such as ceilings on revenue and demand risk as also penalties for shortfall in performance.
- PPPs for metro projects can be designed with broader scope to address revenue risk by including appropriate provisions for commercial activities and property development.



**Table 3.2 Risk Profile of three metros in India developed on PPP framework**

| Risk Type                        | Hyderabad Metro   | Mumbai Metro One  | Delhi Airport Express Line  |
|----------------------------------|---|---|---|
| <b>“PRE-OPERATIVE RISKS”</b>     |   |   |   |
| <b>“Land acquisition delays”</b> |   |   |   |
| Sensitivity                      | High  | High  | High  |
| Risk Period                      | 0-5 Years   | 0-5 Years   | 0-5 Years   |
| Primary Risk Bearer              | Government  | Government  | Government (DMRC)   |
| Remarks                          | <p>“The land has to be handed over to the concessionaire on or prior to the Appointed Date (i.e. date on which financial closure is achieved). Further, up to 90% of the land has to be handed over to the concessionaire within 120 days of signing of the agreement (contingent on paying of Payment Security). This is a Condition Precedent for the Agreement. The government is liable to pay damages to the tune of 0.1 percent of the Performance Security (Rs. 240 crore) for each day of delay. If the GoAP is not able to provide access to the remainder 10% of the land for reasons other than a Force Majeure, it shall pay the Concessionaire damages to the tune of Rs. 1000 per day for every 500 square meters, commencing from the 91st day of the Appointed Date”.</p> | <p>The land for depot, sub-station and access to stations to be provided to the private operator on or before 180 days of of the contract.. While no damages are envisaged for delay on the part of government, MMRDA will grant extension of time including extension of concession period</p>   | <p>Site was to be provided by DMRC. Schedule specified the dates on which access to different sites were to be made available to the concessionaire.</p>  |
| <b>Financing Risks</b>           |   |   |   |
| Sensitivity                      | Medium  | Medium  | Medium  |
| Risk Period                      | 0-5 years   | 0-5 years   | 0-5 years   |
| Primary Risk Bearer              | Party   | Party   | Party/DMRC  |
| Remarks                          | <p>“The Concessionaire has to achieve financial closure 180 days after the signing of the contract. GoAP can extend the date for financial closure for a further 120 days in case the private operator cannot achieve financial closure. The Concessionaire would be liable to pay damages to the tune of 0.1 percent of Performance Security for every day of delay in achieving financial closure. The GoAP has the right to cancel the contract after a period of 6 months from the signing of the contract”.</p>  | <p>“The Concessionaire has to achieve financial closure 180 days after the signing of the contract. MMRDA can extend the date for financial closure for a further 180 days in case the private operator cannot achieve financial closure.” MMRDA has the right to cancel the contract after a period of 6 months from the signing of the contract.</p> <p>\ 134 Crores(26%) equity contribution from MMRDA which retains the right to</p> | <p>As per concession agreement DMRC was to do the civil works and to this extent it shared the risk with the private operator who was responsible for installing enabling systems for operation of metro for the concession period.</p> |

|   |   |   |   |
|---|---|---|---|
|   |   | cancel the contract within 6 months.  |   |
| <b>Planning Risk</b>                                    |   |   |   |
| Sensitivity   | Medium  | Medium  | Medium  |
| Risk Period   | 0-5 years   | 0-5 years   | 0-5 years   |
| Primary Risk Bearer                                     | Party   | Party   | Party /DMRC   |
| Remarks   | "The risk for the planning and execution of the project vests with the private operator. It needs to execute the project in conformance with the detailed design and construction methodology, quality assurance procedures and the time schedule for completion of the Project as submitted by the private operator to the GoAP on or before the Appointed Date. The project is also subject to a review by the Independent Engineer appointed for the project." | -do-  | Like financing risk, this risk was also shared partly by DMRC which was to do the civil works.                              |
| <b>Regulatory, administrative &amp; approval delays</b> |   |   |   |
| Sensitivity   | Low   | Low   | Low   |
| Risk Period   | 0-5 years   | 0-5 years   | 0-5 years   |
| Primary Risk Bearer                                     | Party   | Party   | Party   |
| Remarks   | "This private operator has to obtain all applicable permits/clearances from the Go/GoAP with regard to the implementation of the project. This is a Condition Precedent. However, if the Go/GoAP inordinately delay the project applicable permits so as to cause a Material Adverse Effect then GoAP shall not terminate the agreement"  | "The private operator has to submit a maintenance manual and maintenance program to IE for approval and needs to comply with the requirements in the same." In case the operator fails to operate satisfactorily 97% of scheduled services in 1 <sup>st</sup> year of operation or 99% on any 3 days in a week from 2 <sup>nd</sup> year of operations, it will constitute one penalty point and for each penalty point concession period would be reduced by one day. Outsourcing of O&M was allowed which provided a route to the concessionaire for mitigating this risk | Obtaining permits and clearances-Conditions precedent before financial closure  |
| <b>Construction Phase Risk</b>                          |   |   |   |
| <b>Design Risk</b>                                      |   |   |   |
| Sensitivity   | Medium  | Medium  | Medium  |
| Risk Period   | 0-5 years   | 0-5 years   | 0-5 years   |
| Primary Risk Bearer                                     | Party   | Party   | Party/DMRC  |
| Remarks   | "The private operator has to submit all the drawings and the schedule of the project to the GoAP. These have to be reviewed by GoAP and   | "The private operator has to submit all the drawings and the schedule of the project to the IE. These have to be  | "The private operator has to submit all the drawings and the schedule of the project to DMRC and the consultant". Interface |

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|                            | scrutinised by the Independent Engineer. The GoAP is not liable for any delays caused due to late submissions of drawings of the project.”  | reviewed by IE and scrutinised by the Independent Engineer. The GoAP is not liable for any delays caused due to late submissions of drawings of the project. MMRA is not liable for any delays caused due to submissions or revision of drawings of the project”  | related design issues will be resolved directly with contractors (for the civil work under the domain of DMRC) and will be coordinated by DMRC if so desired by concessionaire. “DMRC is not liable for any delays caused due to submissions or revision of drawings of the project. Design risks for overall route plan and the civil works undertaken were borne by DDMRC”.   |
| <b>Construction Risk</b>   |   |   |   |
| Sensitivity                | Medium  | Medium  | Medium  |
| Risk Period                | 0-5 years   | 0-5 years   | 0-5 years   |
| <b>Primary Risk Bearer</b> | Party   | Party   | Party/DMRC  |
| Remarks                    | “The Concessionaire has to provide a Performance Security of ` 240 crore for the performance of its obligations. This security has to be renewed from time to time and replenished within 30 days. The Concessionaire is also liable to pay damages at the rate of 0.1 percent of the Performance Security/day if it fails to achieve any milestone. Further, the private operator has to submit monthly progress reports and allow the Independent Engineer to inspect the progress of construction. The Independent Engineer has to subject the metro system to test and provide a provisional completion certificate.” | “The Concessionaire has to provide a Performance Security of Rs. 14 crore for the performance of its obligations. This security has to be renewed from time to time and replenished within 30 days. The Concessionaire is also liable to pay damages at the rate of Rs 20 lakh per day if it fails to achieve scheduled completion within 60 months of appointed date. Further, the private operator has to submit monthly progress reports and allow the Independent Engineer to inspect the progress of construction. The Independent Engineer has to subject the metro system to test and provide a provisional completion certificate.” | “The Concessionaire has to provide a Performance Security of Rs. 75 crore for the performance of its obligations. This security has to be renewed from time to time and replenished within 30 days. The Concessionaire is also liable to pay damages at the rate of Rs 2 lakh per day if it fails to achieve any milestone.” If project completion is not achieved by scheduled completion date, a penalty of 0.5% of the performance security per day upto 45 days and 1% per day thereafter will be levied. DMRC can terminate contract if the project is delayed beyond 2 months from scheduled completion date. “Operator to submit monthly progress reports and allow DMRC and consultant to inspect the progress of construction. The Independent Assessor has to subject the metro system to test and provide a provisional completion certificate. DMRC shared the risk for civil works and its |

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|                             |  |   | timely handover to the Concessionaire.”   |
| <b>Change in Scope Risk</b> |  |   |   |
| Sensitivity                 | Low  | Low   | Low   |
| Risk Period                 | 0-5 years  | 0-5 years   | 0-5 years   |
| Primary Risk Bearer         | Government   | Government  | Government (DMRC)   |
| Remarks                     | “If the government requires additional works and services which are beyond the scope of the project, such a change in scope shall be made by GoAP by an order, giving consideration to the operations and maintenance costs which would be spent by the private operator and then subsequently reimbursed by GoAP”                           | “If the government requires additional works and services which are beyond the scope of the project, such a change in scope shall be made by GoAP by an order, giving consideration to the operations and maintenance costs which would be spent by the private operator and then subsequently reimbursed by GoAP.”<br>Concessionaire is entitled to nullify change of scope order if cumulative effect of change of scope order is more than 5% of the project cost. | “If DMRC requires additional works and services which are beyond the scope of the project, such a change in scope shall be made by DMRC by an order and cost and time for implementation will be mutually agreed and then subsequently reimbursed by DMRC”  |
| <b>Financing Risk</b>       |  |   |   |
| Sensitivity                 | Medium   | Medium  | Medium  |
| Risk Period                 | 0-5years   | 0-5years  | 0-5years  |
| Primary Risk Bearer         | Party  | Party   | Party   |
| Remarks                     | “The private operator is solely responsible for arranging financial closure for the project. The private operator has to achieve financial closure within 180 days. The government may provide an additional period of 120 days after this period subject to the payment of damages (0.1 percent of Performance Security) per day of delay.” | “The private operator is solely responsible for arranging financial closure for the project. The private operator has to achieve financial closure within 180 days. The government may provide an additional period of 180 days after this period”.   | “The private operator is solely responsible for arranging financial closure for the project. The private operator has to achieve financial closure within 180 days. DMRC may provide an additional period of 60 days after this period subject to the payment of damages” @ Rs one lakh per week of delay. Work however has to start within 30 days of agreement date from equity portion(reimbursable by DMRC in case of termination before financial close) |
| <b>Technology Risk</b>      |  |   |   |
| Sensitivity                 | Medium   | Low   | Low   |
| Risk Period                 | 0-5years   | 0-5years  | 0-5years  |
| Primary Risk Bearer         | Party  | Party   | Party/DMRC  |
| Remarks                     | “The technology risk vests with the both the private operator and the government as the project would be executed in conformance with the detailed design and  | “Project to be executed in conformance with the specifications and standards specified in the agreement “   | “Project to be executed in conformance with the specifications and standards specified in the agreement. “  |

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|  | construction methodology, quality assurance procedures and procurement of engineering and construction time schedule for completion of the Project as submitted by the operator to the GoAP and approved by the Independent Engineer”.   |  |  |
| <b>Operations &amp; Maintenance Risk</b> |  |  |  |
| Sensitivity                              | Medium   | Medium   | Medium   |
| Risk Period                              | 0-35 years   | 0-35 years   | 0-35 years   |
| Primary Risk Bearer                      | Party  | Party  | Party  |
| Remarks                                  | “The private operator has to submit a maintenance manual and maintenance program to GoAP for approval and needs to comply with the requirements in the same. In case of non-compliance with these requirements the government has the right to undertake and complete these requirements by itself and recover 120% of the costs associated with completing these requirements or even initiate termination proceedings if necessary. The private operator can mitigate this risk as he is allowed to appoint O&M contractors for the running of the system” | “The private operator has to submit a maintenance manual and maintenance program to IE for approval and needs to comply with the requirements in the same”. In case the operator fails to operate satisfactorily 97% of scheduled services in 1 <sup>st</sup> year of operation or 99% on any 3 days in a week from 2 <sup>nd</sup> year of operations, it will constitute one penalty point and for each penalty point concession period would be reduced by one day. Outsourcing of O&M is allowed under the contract which provides an opportunity to the concessionaire for mitigating this risk | “The private operator has to submit a maintenance manual and maintenance program to DMRC 45 days before start of a FY and needs to comply with the requirements in the same. In case of closure of project or part thereof, DMRC has the right to undertake and complete these requirements by itself and recover 125% of the costs associated with completing these requirements. Damages are payable to the extent of 0.1% of the average fare on that section in the 1 <sup>st</sup> year of operation. During concession period damages will be payable after 30 days of default @ 0.5% of the average daily fare or 01% of the cost of repair estimated by the consultant whichever is higher”. |
| <b>Market Risk</b>                       |  |  |  |
| Sensitivity                              | High   | High   | High   |
| Risk Period                              | 0-30 years   | 0-30 years   | 0-30 years   |
| Primary Risk Bearer                      | Party/ Government  | Party  | Party  |
| Remarks                                  | “The private operator will levy and collect the fares from the users of the Metro and is entitled to revise these fares upto 60% of the Wholesale Price Inflation in the previous year. The private operator shares the traffic risk with the government. The government would provide a revenue shortfall loan to the tune of the revenue shortfall at an interest rate 2% above the standard bank rate   | “The private operator will levy and collect the fares from the users of the Metro which are fixed at 2003-04 level and indexed @11% every fourth year. No revenue guarantee from the government”   | “The private operator will levy and collect the fares from the users of the Metro and is entitled to revise these fares upto 90% of the Wholesale Price Inflation in last two years”.  |

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|                         | specified by the RBI. In the event of the actual traffic falling short of the target traffic by more than 2.5 percent, on a pre-determined target date (1 October 2011), the concession period shall be increased by 1.5 percent of the concession period thereof for every 1% shortfall compared to actual traffic. In the event the actual traffic is more than target traffic then the concession period will be reduced by 1% for every 1% reduction in traffic.”  |   |   |
| <b>Performance Risk</b> |  |   |   |
| Sensitivity             | High   | High  | High  |
| Risk Period             | 0-30 years   | 0-30 years  | 0-30 Years  |
| Primary Risk Bearer     | Party  | Party   | Party   |
| Remarks                 | “The private operator has to provide a Performance Security of Rs. 240 crore for the performance of its obligations. Further, the private operator is not allowed a change in ownership that causes the aggregate holding of the Consortium Members, together with their Associates in the total equity to decline below 52 percent during a period of 5 years following the Commercial Operations Date of the Metro System and 26 percent during the rest of the concession period. Any change of equity greater than 15 percent would require prior written approval of the government.” | “The private operator has to provide a Performance Security of Rs.14 crore for the performance of its obligations. Further, the private operator is not allowed a change in ownership that causes the aggregate holding of the Lead Consortium Members, in the total equity to decline below 51 percent during a period of 2 years following the Commercial Operations Date of the Metro System and 26 percent during 15 years after COD. Each consortium member other than lead member to hold minimum 5% equity upto 2 years from COD.” | “Borne by the Concessionaire (excepting for Civil Works) through a Performance Guarantee (Rs 75 crore), initially valid for a period of 5 years and renewable from time to time. Further, the private operator is not allowed a change in ownership that causes the aggregate holding of the consortium members to decline below 100% (Lead Consortium Member, below 30 percent) until the date falling 2 years after COD and 51% (lead member 26%) percent until the date falling 10years after COD” |
| <b>HANDOVER RISKS</b>   |  |   |   |
| <b>HANDOVER RISKS</b>   |  |   |   |
| Sensitivity             | Low  | Low   | Low   |
| Risk Period             | 35th year  | 35th year   | 30th year   |
| Primary Risk Bearer     | Party  | Party   | Party   |
| Remarks                 | “A joint inspection would be conducted by the private operator and GoAP, 90 days before the termination of the Agreement. This would be verified by an Independent Engineer and the private operator would have to pay the charges for compliance with the serviceability requirements, if found deficient”  | “Joint inspection by both parties 60 months prior to the expiry of concession period to gauge compliance with serviceability requirements defined in the agreement, private party to pay charges if found deficient “   | Two joint inspections are envisaged between 30-36months and 2nd between 9-12 months before the expiry of concession period to estimate repair/ renewal work to complete divestment requirements. Last 2 year fare will be retained in escrow account towards estimated repairs to the extent estimated and not carried out till   |

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|  |  |  | then.  |
| <b>Private Operator Event of Default</b> |  |  |  |
| Sensitivity                              | Low  | Low  | Low  |
| Risk Period                              | 0-35 years   | 0-35 years   | 0-30 years   |
| Primary Risk Bearer                      | Party  | Party  | Party  |
| Remarks                                  | <p>"Only lenders are protected and the equity holders bear the major risk. (GoAP is liable to pay 90% of debt due less insurance claims) and 70% of Additional Termination Payment comprising Real Estate Development and any other assets (as valued by an Approved Valuer) developed after the 5th anniversary of the Commercial Operations Date".</p>   | <p>"Lenders are protected and MMRDA is liable to pay 90% of debt due less insurance claims".</p>   | <p>"Only lenders are protected and the equity holders bear the major risk. (DMRC is liable to pay 80% of debt due less insurance claims) "if project is terminated after COD. No Termination Payment before COD.</p>   |
| <b>Government Event of Default</b>       |  |  |  |
| Sensitivity                              | Low  | Low  | Low  |
| Risk Period                              | 0-35 years   | 0-35 years   | 0-30 years   |
| Primary Risk Bearer                      | Government   | Government   | Government   |
| Remarks                                  | <p>"GoAP is liable to pay 150% of adjusted equity, 115% of Concession Royalty Payments which have already been paid to the GoAP, Debt due and 115% of Additional Termination Payments comprising Real Estate Developments and any other assets). "</p>   | <p>"MMRDA is liable to pay 110% of adjusted equity and 100% of Debt due "</p>  | <p>DMRC is liable to pay 130% of adjusted equity, outstanding debt and depreciated value of the project assets if any installed after 10<sup>th</sup> year of COD".</p>  |
| <b>Force Majeure</b>                     |  |  |  |
| Sensitivity                              | Low  | Low  | Low  |
| Risk Period                              | Throughout   | Throughout   | Throughout   |
| Primary Risk Bearer                      | Party  | Party  | Party  |
| Remarks                                  | <p>"Force Majeure risks are transferred to the extent of insurance, but are largely borne by the private sector. In case of a Force Majeure event before the financial closure date, the project completion date and concession period would be extended. Compensation for Force Majeure arising out of a direct political event would be paid to the extent of a termination payment arising out of a government event of default. The compensation shall include O&amp;M expenses, debt, additional termination payments and increases in cost of construction."</p> | <p>"Force Majeure risks are transferred to the extent of insurance, but are largely borne by the private sector. In case of a Force Majeure event before the financial closure date, the project completion date and concession period would be extended. Compensation for Force Majeure arising out of a direct political event would be paid with interest" @ SBI PLR plus 2% or extension of concession period as recommended by IE for reimbursement of force majeure costs or permission to undertake any other mutually agreed revenue generating activity. "The compensation shall not include loss of fare revenue but include O&amp;M</p> | <p>"Force Majeure risks are transferred to the extent of insurance, but are largely borne by the private sector."In case of a termination on account of persisting force Majeure event the compensation shall include 10% of debt due and depreciated value of the project assets if any installed after 10<sup>th</sup> year of COD</p> |

|                           |  |  |  |
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|                           |  | expenses, debt, additional termination payments and increases in cost of construction”   |  |
| <b>Change in Law Risk</b> |  |  |  |
| Sensitivity               | Low  | Low  | Low  |
| Risk Period               | Throughout   | Throughout   | Throughout   |
| Primary Risk Bearer       | Party  | Party  | Party  |
| Remarks                   | “No compensation due from the government, although an enabling provision to mutually discuss in good faith to suitably amend the terms of the concession agreement, including extension of concession if the financial effect of the change in law is greater than Rs. 1 crore and 0.5% of the Realisable Fare in the Accounting Year. GoAP is required to make amendments to the Agreement so as to enable the private operator to be in the same financial position as it would be had there been no Change in Law.” | “No compensation due from the government, although an enabling provision to mutually discuss in good faith to suitably amend the terms of the concession agreement, including extension of concession if the financial effect of the change in law is greater than Rs. 1 crore and 0.5% of the Realisable Fare in the Accounting Year. GoAP is required to make amendments to the Agreement so as to enable the private operator to be in the same financial position as it would be had there been no Change in Law.” | “If the financial effect of the change in law is greater than Rs. 10 lakh (positive as well as negative) in the Accounting Year. DMRC is required to make amendments to the Agreement so as to enable the private operator to be in the same financial position as it would be had there been no Change in Law.” |

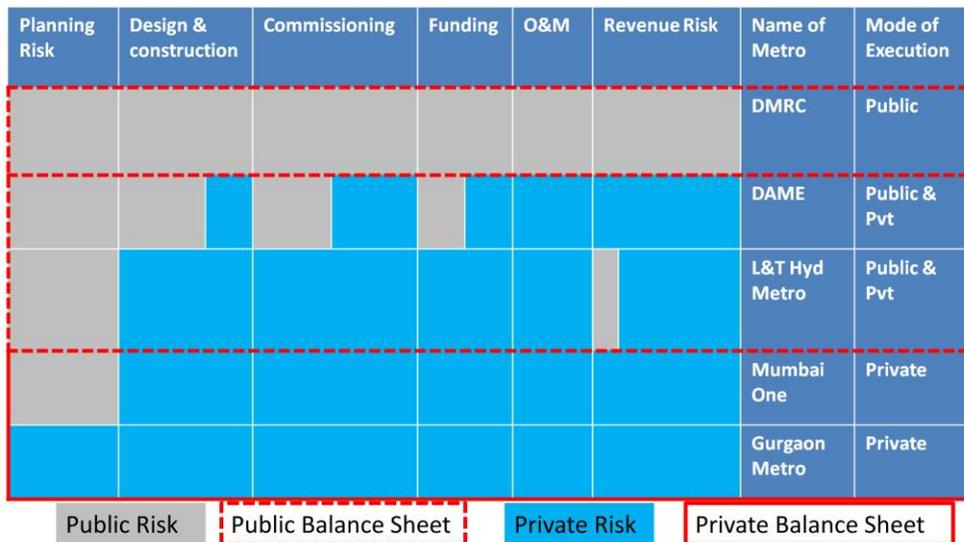
Source : [www.pppindia.com](http://www.pppindia.com) and the respective concession agreements of the three metro.

Figure 3.3 attempts to cover the range of risk transfers that have been achieved in the three PPP metros in comparison to DMRC or most of the other metros built through public financing and Gurgaon metro built through 100% private investment.



**Figure 3. 3 : The Spectrum of Public Private Partnership Risk Transfers in India Metros**

(Adopted from AMP Capital, 2011)



**Figure 3. 4 : Public Debt Deleveraging Potential in Various Indian Metros**

(Adopted from AMP Capital, 2011)

Gurgaon metro, as is seen from the Figure 3.3, is the ultimate expression of a PPP, in which the entire control and risks rest with the private consortium. Hence there is ample scope in PPPs to transfer a greater part of economic risk to the private operator and take the metro project off the

government's balance sheet. This is demonstrated in the Figure 3.4. PPPs structured on the lines of Mumbai metro one and Hyderabad metro offer governments the opportunity to both deleverage their balance sheets and save on construction and O&M costs. It is expected that proposed new metro bill and metro policy will pave the way for governments to structure a PPP metro project around a fair business model to make it attractive enough for private operators to accept high level of risk transfer thereby enabling governments to deleverage their balance sheets. New models of PPPs may emerge.

### **3.9 THE PROPOSED METRO BILL AND METRO POLICY 2016**

The National Urban Transport Policy 2006 provides for viability gap funding of 20 per cent of the capital cost of the project to metro projects going for the PPP model. State government can contribute another 20%. However no new metro has been conceived/announced on PPP framework utilizing VGF after approval of Hyderabad Metro.

Metro projects are capital intensive and despite high cost are justifiable on account of high carrying capacity and speed to cater to densely populated Indian cities where traffic congestion is chaotic. Government has, as a policy initiative, proposed Metro Rail Bill 2016 and a new Metro policy with provisions for private participation in urban metro projects to reduce burden on government coffers. Metro fares have to be kept low in view to enable masses to choose this as a mode of travel. As a consequence, a metro becomes a slow return and longer pay back project, increasing the risk for private capital. Not only the proposed draft bill provides for PPP but it also recognizes that fare box revenue alone cannot make a metro project viable and therefore has provisions for inclusion of property development and commercial activities in the concession agreement.

An urban metro project presently is governed by various legislations; "The Metro Railways (Construction of Works) Act, 1978"; "The (Delhi) Metro Railways (Operation and Maintenance) Act, 2002"; and, "The Metro Railways (Amendment) Act, 2009". It is expected that after the new metro act is enacted, these three acts will become redundant as provisions of all existing acts will be brought under this act. Most of the metro projects in India have

faced land acquisition problems during construction. While the average period from inception to commencement of first run average four years, Mumbai metro and Chennai metro one took 5 and 6 years respectively. The new act is likely to include provisions of the new land acquisition act of 2013 facilitating faster acquisition of land for metro rail projects by introducing ‘urgency clause’.

The proposed bill proposes to transfer all powers with respect to metro rail technical planning and safety to Mood from the Ministry of Railways and Commissioner of Metro Rail Safety (CMRS) from the Ministry of Civil Aviation respectively. It also proposes the setting up of a permanent fare fixation authority under the act to decide on fare and frequency and extent of revision.

Advertisement rights, sale of space above the metro stations, property development rights and innovative use of metro stations leveraging high footfall to convert them into major market attractions, betterment levy, development charges, land value tax and fee for changing land use on builders and promoters can greatly contribute to generate funds for creation of metro project infrastructure. A dedicated fund for MRTS is also on the anvil.

It is expected that the proposed Metro Rail Bill 2016 and the draft Metro policy will boost private investment in rail based metro systems across the country.

### **3.10 CONCLUDING REMARKS**

An overview of Indian experience with PPP metros has been presented in the chapter. The three metros built/being built on PPP framework so far are having different funding/ownership structures. These ownership structures have been compared with that of pure public e.g. DMRC and pure private e.g. Gurugram rapid metro. The three PPP metros have been discussed in detail giving the background and problems faced in their implementation. While the case study of Hyderabad metro is presented in a separate chapter in detail, cases of Delhi airport express line and Mumbai metro one have been analyzed based on various contract and project documents, reports etc. and through information gathered during semi-structured interviews with concerned

government and private officials who were associated with the structuring of the project, bid process and its implementation. A detailed analysis of how various risks in the three PPP metros have been allocated and addressed in the concession agreement has been presented in tabular form. A comparative schematic summary has been used to demonstrate how the economic risk transfer under different ownership structures of Indian metros affect deleveraging of public debt. The chapter has been concluded highlighting the main features of proposed draft Metro Bill and Metro Policy.