



# Hyderabad Metro a Behemoth of a PPP



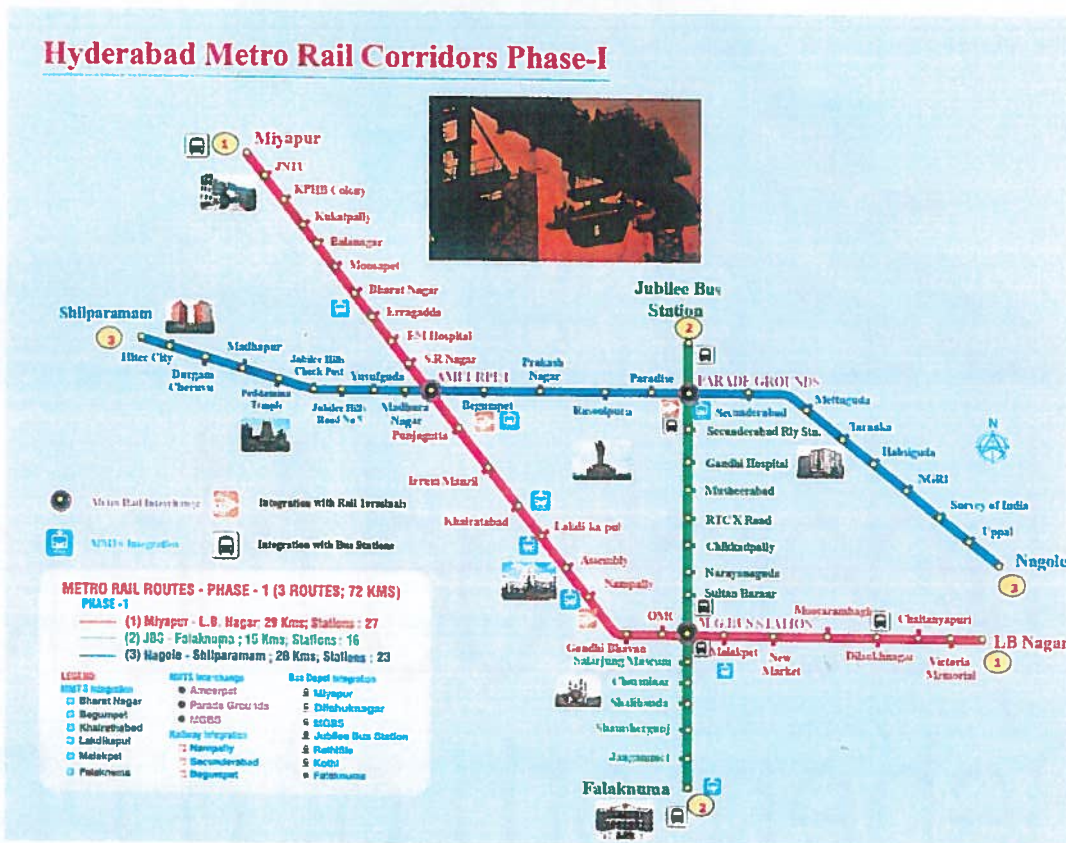
**NEERAJ JAIN**

**Neeraj Jain** has a Bachelors Degree in Civil and a Masters in Structural Engineering from IIT Kanpur. In 2011 he quit the Railway after 30 years of service to head the construction of the Charkop-Bandra-Mankhurd Metro corridor in Mumbai on behalf of Reliance Infrastructure. Neeraj Jain is currently with Louis Berger Consultants at Hyderabad, where LBC are the Independent Engineers for the Hyderabad Metro. The author has written an article on the Mumbai metro network in our earlier issues.

## Preamble

The Hyderabad metropolitan area spans over 1900 km<sup>2</sup> and in that sense is larger than the Metropolitan area of Delhi, Kolkata, Bangalore or Chennai. The population as per 2011 census is 6.38 million. The Metropolis is an amalgam of the old and the new. With stately palaces from the Nizam's era, the crowded lanes and bye lanes to the modern glass fronted buildings which house the offices of the Who's Who of the international IT industry.

A metro having 72 route kilometres. in Phase 1 has been planned for this city. In this article spread over two issues, a brief outline of this project is covered in this edition, while the next issue will give a glimpse of the major technical innovations and challenges of this project and how they are being overcome.



To meet with the rapidly burgeoning and developing city, there was need to provide a quick, safe, reliable, clean and comfortable transport system. The Hyderabad Metro is likely to be a showcase project for the success of the PPP framework for project execution. This project was in the news a few years back for all the wrong reasons. (Recall the Maytas scandal?). After throwing out the earlier concessionaire Maytas, the project is now in the very capable hands of the Concessionaire L&T who are executing the project through a special purpose vehicle named LTMRHL. The project is being guided by the dedicated Government of Telangana body by the name of Hyderabad Metro Rail Limited (HMRL) headed by a former Railway Officer

Shri NVS Reddy. This article gives an overview of the project and its challenges.

The numbers that go with the Hyderabad Metro project are all astounding. 72 kms over three double line elevated corridors, serving 66 stations. Project cost of Rs. 14,132 Crores or \$ 2.36 Billion, timeline of 5 years from planning to commissioning, tell their own story.

To concurrently take up a task of 72 kms of Metro Construction is indeed a gigantic task. To give the benefits of the project from earlier days rather than wait for 5 years, the project has been planned to be split into 6 stages, and it would be progressively commissioned in stages, the first stage from Nagole to Mettaguda on Line 3 being slated for commissioning in the first half of 2015.



## Stage wise commissioning sequence

Stage	Section	Line	Length
1	Nagole - Mettaguda	3	8.2
2	Miyapur - SR Nagar	1	11.6
3	Metaguda- Begumpeth	3	8.2
4	Begumpeth- Shilparaman	3	11
5/1	SR Nagar- MG Bus stand	1	8.1
5/2	MG Bus Stand- LB \ Nagar	1	9.2
6	JBS- Falaknuma	2	15



Train set at inspection bay



Track leading to depot

## Salient parameters planned for Hyderabad Metro

**Length:** 72 Kms with 66 Stations at 63 locations (having three interchange stations) over 3 corridors.

**Depots:** Three nos., one for each corridor, at Miyapur, Falaknuma and Uppal over land aggregating to about 215 acres.

**Casting yards :** Two nos. at Uppal and Qutbullapur.

**Structure:** Segmental Precast girders. Square piers flared out at top to accommodate girder bearings.

**Alignment:** fully elevated.

**Track Gauge:** Standard Gauge 1435 mm

**Railway Crossings :** 7 nos

**Track:** 60 Kg rails on concrete plinth, with bearing plates. Vassloh fittings

**Max Speed:** 80 kmph

**Av speed end to end:** 34 kmph

**Headway :** 3 minutes to 5 minutes

**Coaches in train:** 3 coaches extendable to 6.

**Period of Concession:** 5 years construction, 30 years operation

**Traction :** 25 KV AC overhead catenary and contact wire.

**Coach Width:** 2.9 metres.

Train capacity 1000 for 3 coach and 2000 for 6 coach train.

**Cost of Project :** Rs 14,132 crores

**VGF provided by Govt:** Rs. 1458 crores.

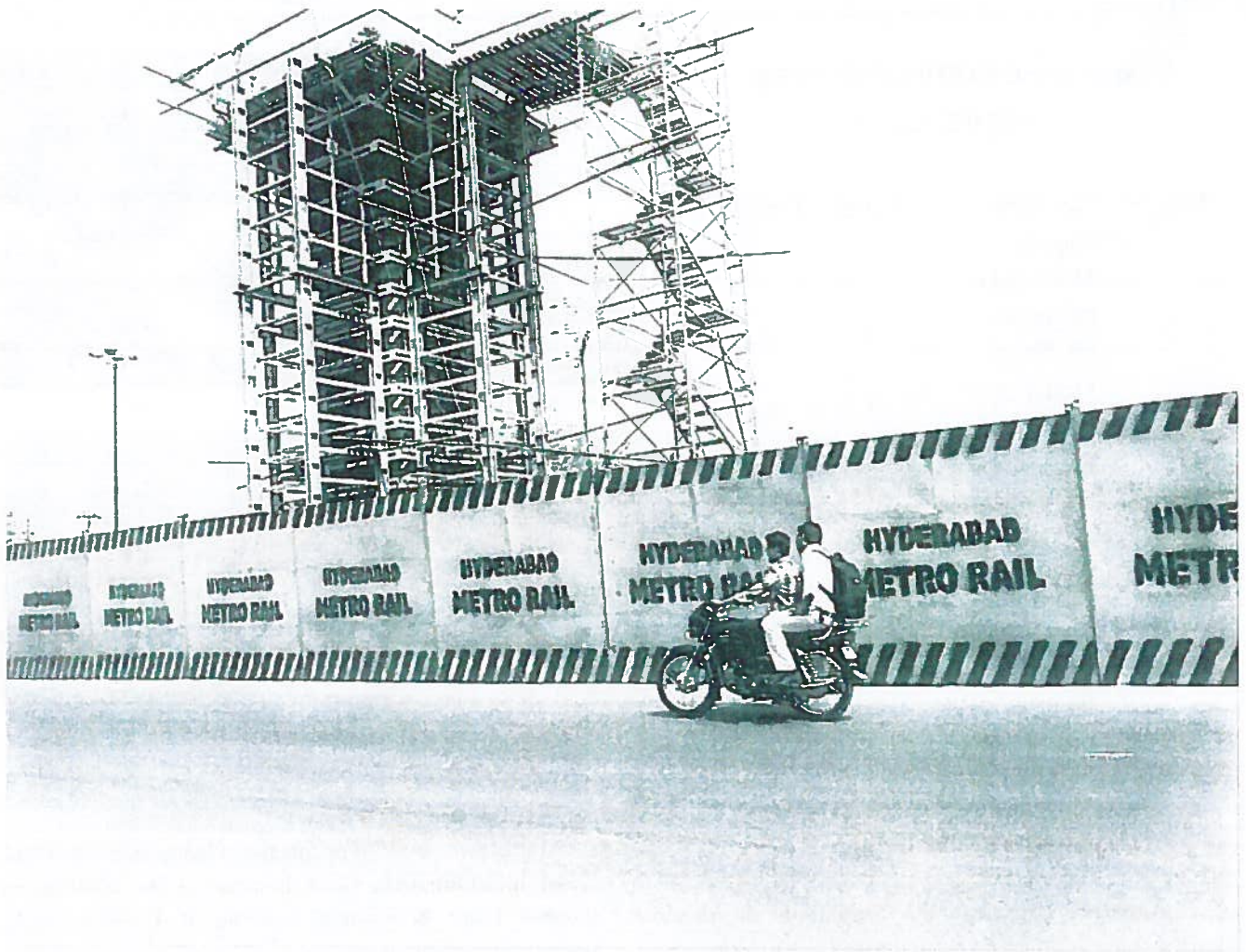
Apart from VGF to be given to Concessionaire by the Govt., in addition the Govt. is spending Rs. 1980 crores towards Land Acquisition, Shifting of Utilities, R&R, pedestrian facilities etc.

**Signalling:** Communication Based Train Control (CBTC), having Complete Automatic train Operation (CATC) and Complete Automatic Train Protection (CATP).



The complex arrangement required for track plinth casting

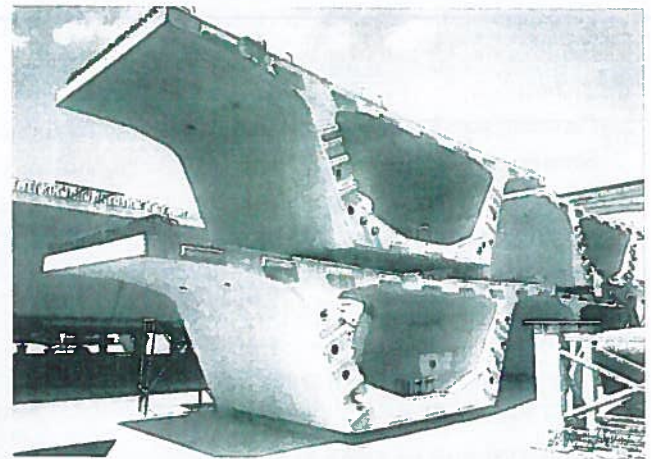




*Barricading of work site for safe working*



*Uppal Depot*



*Girder Segments stacked in casting yard*

**Some important dates:**

**Signing of CA:** 4th Sept. 2010

**Appointed Date:** 5th. July 2012

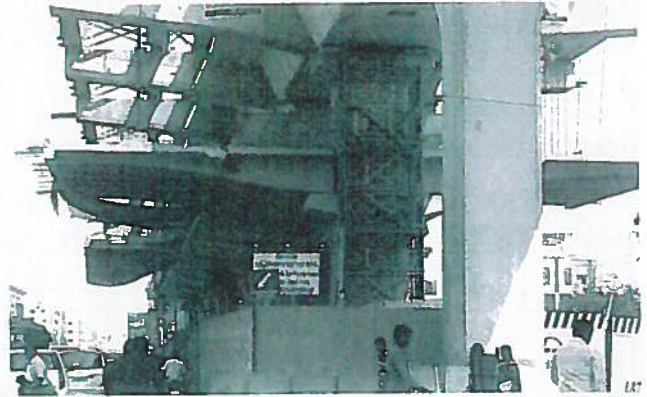
**COD** as per contract : 5 years from Appointed Date ie 4th July 2017.

Appointment of Independent Engineer (IE) : 8th. Feb. 2011.



**Some indicative numbers of the scale of construction:**

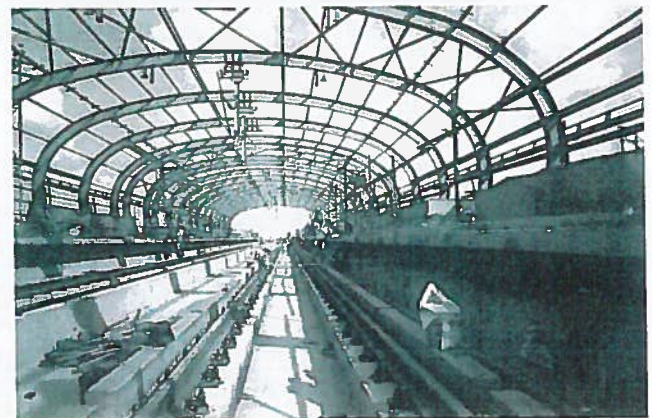
- Concrete -12.3 Lac Cum
- Reinforcement Steel -1.4 Lac MT
- PT Strands -0.11 Lac MT
- Structural Steel -0.2 Lac MT
- HDPE Sheathing -7 Lac Rmts



A station structure under construction



Erected Spans in Stage 1



Roof skeleton for station platform coming up



Track on sharp curve

Particulars	Corridor 1	Corridor 2	Corridor 3	Total
Route	Miyapur – L.B Nagar	JB Station - Falaknuma	Nagole - Shilparamam	-
Length	29.29 Km	15.43 Km	27.29 Km	72.02 Km
Stations	26 nos.	16 nos.	23 nos.	65 nos.
Depots	Depot (Miyapur)	Stabling Yard (Falaknuma)	Depot (Uppal)	3 nos over 215 acres
Stages	2,5	6	1,3,4	
MMTS Interchange	Bharat Nagar, Khairatabad, Malakpet	Falaknuma	Begumpet	
Railway Interchange	Nampally	Secunderabad	Begumpet	
Bus Depot Integration	Miyapur Bus Station, Dilsukh Nagar & MGBS	Jubilee Bus Station, Charminar Bus Station.		



## GLOSSARY OF TERMS

**Appointed Date** The date which determines the various milestones to be achieved during the life of the project. It may be before, after or concurrent with the Financial Closure.

**BOT** a project where the Concessionaire may Build, Operate and Transfer, but may not necessarily Finance the Capital Expenditure.

**CA (Concession Agreement):** The agreement which lays down the framework of the PPP agreement

**Commercial Development:** The right given under the Concession agreement to develop and use a portion of the Government/project property for Offices/shops etc, which can be leased out for earning revenue, enabling the improvement of financial viability of the project. Same as TOD.

**Concession:** The grant of right to a private party to develop a project under PPP.

**Concessionaire:** The Private party associating with the Govt. to Develop a Project.

**Concessioneing Authority:** The Authority which grants and regulates the Concession to the private party in a PPP. In this case the Govt. of Telangana the successor to Govt. of Andhra Pradesh.

**Concession Period:** The total period available to the Concessionaire for Developing as well as running the Project. In this case 35 years.

**FBOT:** Finance Build Operate and Transfer. The framework under which the concessionaire Funds and Builds an Infrastructure project, operates and earns Revenues for a specified no of years and finally transfers the assets in working order back to the Govt. Agency.

**Financial Closure:** The event of the Private party to the CA finalizing the private funding for the project through Bankers/ Financial Institutions.

**HMRL:** Hyderabad Metro Rail Limited the Govt. body to oversee the project on behalf of the State Govt.

**Independent Engineer (IE):** typically and Internationally renowned consultancy firm appointed to a project to oversee the safety and quality in construction, ensure conformance of the provisions of the CA by both the Concessioneing Authority and the Concessionaire. The IE being an independent body also typically steps in to resolve any disputes between the two parties to the CA.

**LTHMRL:** Larsen & Toubro Hyderabad Metro Rail Limited, the Special Purpose Vehicle created by I&T to Execute the project.

**PPP Public Private Partnership:** A mode of funding where the private parties put their money in partnership with Govt. for infrastructure Development

**R&R Relief and Rehabilitation:** Pertains to Governments responsibility/onus to rehabilitate the project affected persons.

**TOD :** Transit oriented Development. Same as Commercial Development but specifically along the Corridor.

**VGf Viability Gap Funding.:** A part of the cost of the PPP project borne by the Govt. to seek to make the project financially viable for the Private Party. Occasionally this is shared between the State and Central Govt.