Transporting The Earth
Heavy Haul by Rail

Worldwide experience dictates a higher axle load for India

Hyderabad Metro & L&T: new benchmarks for private investment

Formations are critical to longterm track health

Resurrection of the long freight trains

Wide options for track machines
Hyderabad: a rainbow cooperation

Hyderabad Metro: a rainbow cooperation

Hyderabad, with its twin city Secunderabad, is choked by transport growth. Not unlike other major Indian cities. Relief could be just a couple of years away, with the dream of mass rapid transport through an elevated 68 km metro network expected to begin operations in 2014. But then again, this project is just more than another metroicity metro: it is a nearly Rs 20,000 Cr projects with more than 80% investment (build and operate) from the Indian private sector major Larsen & Toubro (L&T). Hyderabad metro needs to succeed to be a role model for enhanced private sector investments in the Indian rail sector. A negative report would be a long term damper.

"Before and after the Metro"

NVS Reddy, MD, Hyderabad Metro Rail (HMR) is passionate about both the city and rail transport as he enumerates the advantages, the need and the models followed for this project. He believes that HMR is the most modern and state-of-the-art 21st century metro system.

NVS Reddy conceptualises the metro as a catalyst for urban connectivity.

"A treasured path was naturally not available and developing model documentation involved multiple experts, ably aided by G Haldea from the Planning Commission; the structure of the agreement was later appended by inputs from expert groups. HMR was able to develop its own policies and procedures including manual of standards and specifications. Here experience of smaller projects came in. Reddy recounts that having worked earlier on smaller public projects in Hyderabad municipality, he had built a confidence for this prove out venture. The bidding centered about suitability of the bidding consortia and the lowest viability gap funding required and L & T offered 10%. The agreement in Sep 2010 and a financial closure in March 2011 set a record speed for a pioneering project. The project is to be billed even 5 years after commissioning, with a project IRR expected to be around 17%. A consortium of 10 public sector banks led by SBI is financing the project. GoAP will spend another Rs 1,980 Cr towards land acquisition, R&R package, shifting of utilities, etc. (this does not form part of the project cost as per VGF guidelines of GoI).

Project contours

"Appointed Date" (a contracted start date) for the HMR project was declared as July 05, 2012 jointly by Andhra Pradesh and the Concessionaire L&T Metro Rail Hyderabad Ltd. Concession period of 35 years including the Construction Period of 5 years will be counted from this date.

-Govt. approved project cost of Rs 12,132 Cr (updated cost approved by lenders: Rs 14,133 Cr.)
- Viability Gap Funding by GoI and balance by the concessionaire (L&T)
- Additional Rs 1,980 Cr. by GoAP for land acquisition, shifting of utilities, relief and rehabilitation, pedestrian facilities, etc.
- Concession Period 35 years (incl. 5 for construction), extendable by another 25 years.
- 269 acres of land for 3 Depots and passenger/commercial areas at 25 stations.
- Scope for property development through air space use – property cannot be sold.
- Lease rentals during concession to cross subsidize losses.
- Property + rail system to revert to government at the end of concession.
- The initial studies and project reports were carried out by Delhi Metro. The project will involve three corridors:
  - Miyapur (Terminal) – LB Nagar 24.9 km, 27 stations.
  - Secunderabad – Falaknuma, 14.8 km, 16 stations.
  - Nagole – Shilparamam, 27.5 km, 23 stations.
- A station every km plan indicates the high population activity in the areas served.

Construction features

- Elevated twin line rail tracks on a deck erected on piers generally in central median stations at an average interval of 1km (total: 66 stations).
- Adequate parking space & circulat ing area at stations for modal integration.
- Max speed: 80 kph; Average speed: 34 kph

- Air conditioned coaches with automatic door closures & other safety features.
- Sophisticated signalling system based on ATP, ATC, ATO.
- A maximum service frequency of 3 minutes during peak hours.
- Carry about 1.5 million passengers per day by 2017 and 2.5 million by 2022.
- Smart ticketing with contact less cards.

Business model and tariffs

HMR fare structure involves slabs from ₹ 8 to ₹ 19 with 5% increase per year for the first 15 years & 60% of WPI-based inflation. HMR has strategized a more practical approach to face revisions so that private investors could realistically compute the long term returns. By contrast the Delhi Metro adopted a model with a fare success committee that has faced resistance and interference.

The system has prioritised revenues from the urban transport system with 300 m on both sides of the rail system having been declared for special incentives for transit oriented development. HMR has acquired 269 acres of government land at 25 different locations for revenue generation schemes including parking and circulatory shopping. Reddy stresses that the private sector involvement has helped better investments and faster technical decision making.

Diverse needs for urban transport investment

From the railway’s standpoint, the foremost concern stems from operational losses suffered on these services and capacity constraints. Railway networks in urban areas were primarily built for long-distance intercity transport. Only with segregation of suburban and long-distance passenger/ freight traffic, efficient provision of commuter service is possible. MRVC in Mumbai and MMTS in Hyderabad are two successful models for financial participation and cooperation with State Governments. Other states need to be engaged for similar initiatives.

Viable cost sharing arrangements for both infrastructural and rolling stock management and investment of commuter operations need to be configured. It envisaged that over the next 20 years IR’s share of expenditure (at 50%) in augmentation of urban networks would amount to ₹ 3000 Cr. per annum or roughly ₹ 60,000 Cr.

In addition, two electric rail corridors are using the existing right of way of railways in both Western and Central Railways in Mumbai (Churchgate-Virar and Mumbai VT to Karjat) costing approximately ₹ 40,000 Cr. could be implemented through PPP along with Viability Gap Funding. Similar other projects in Mumbai and other cities will come up in future. It is estimated that an investment of the order of ₹ 2, 60,000 Cr. would be required on this account.


Ahead on an uncharted path

Heading the largest PPP sector Metro rail project in the world comes easy to NVS Reddy. With about 30 years experience of various government positions and his prior work as Additional Commissioner of Hyderabad Municipal Corporation, Director (Finance) of the state’s power distribution company and the mega Konkan Rail project, he has all contributed to bridging the divide with the private sector. One can see that he speaks a language called ‘can do’ even in the archaic government setups that he has to confront regularly. Successful management of a large PPP project needs leaders of such understanding and ‘can do’ attitude.

Reddy is known for his financial acumen, managerial ingenuity, open minded approach and leadership. He has built on his early years in IR’s Accounts Service, with experience acquired in diverse positions in Rail Transportation, Power, Urban Transportation, Urban Governance and Project Management. Reddy is always willing to share and learn, speaking regularly in engineering, management and professional institutes in India and abroad.
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Before and after the Metro

NVS Reddy, MD, Hyderabad Metro Rail (HMR) is passionate about both the city and rail transport as he enumerates the advantages, the need and the models followed for this project. He believes that HMR is the most successful city metro project in India. He adds that for Hyderabad (that traces its roots to the 15th-century Golconda fort and includes the diamond mines), history could be defined as "Before and After the Metro" with the commissioning of the elevated Metro. HMR is expected to answer the burgeoning traffic problems and redefine the cityscape making it the most livable city in India. Besides, it could be a game changer for railway investments.

In the late 1990s, initial efforts of converting the long distance railways to serve intra-urban needs were, rather sketchily, addressed through the concept of MMTS (see accompanying report). The existing railway lines were not designed to serve the work or residential centres deep within the city; MMTS addressed the problem rather superficially, more in hope than in plan. The 72 km HMR network, planned for completion in 2015, will end up costing nearly ₹20,000 Cr that includes ₹2000 Cr from the Central government's viability gap funding. This would be a major project where a railway system has been provided with such a large VGF, even as IR has not been able to get such funding for any other project.

The local state government decided to go to the PPF route early. The first bidding effort, though completed in 2007, was vitiated with the collapse of the Satyam group. The private investment has been made by L&T, a ₹60,000 Cr Company and L&T is one of the largest and most respected among India's Corporates, with interests in engineering & construction and footprints in manufacturing, IT, financial services and a growing international presence. Just 5 metro projects the world over are in PPF mode, indicating the faders that had to be crossed. It has not been a very easy process for a major private sector investment in an urban transport. The initial hurdles have included suspicion, legal hurdles and NGO activities which have fortunately been overcome broadly.

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The system has prioritised revenues from the urban transport fare with over 300 m on both sides of the rail system having been declared for special incentives for transit oriented development. HMR has acquired 269 acres of government land at 25 different locations for revenue generation schemes including parking and circula tory shopping. Reddy stresses that the private sector involvement has helped better estimations and faster technical decision making.

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In addition, two electric road rails are using the existing right of way of railways in both Western and Central Railways in Mumbai (Mumbai Suburban and Taken VT to Karjat) costing approximately ₹40,000 Cr. could be implemented through PPF along with Viability Gap Funding. Similar other projects in Mumbai and other cities will come up in future. It is estimated that an investment of the order of ₹ 60,000 Cr. would be required on this account.

Road sector integration

The peak load traffics in Indian cities can be overwhelming. HMR steps in to address this concern with a master plan for pedestrian facilities, estimated to 1160 km. A multi-modal road sector integration will be the focus around the areas of bus terminals, MMTS local train stations and metro gom road bases with residential colonies. Interchanges are provided at 3 points: Amberpet, Park Road Grounds and MG Bus besides IR interchanges at Nampally, Secunderabad and Begumpet. In effect a lot of thought was given to the transport experience rather than just a A to B service on rail.

An international MRTS consultant major, Louis Berger, the Independent Engineer, will oversee designs & drawings, monitor progress & quality of construction and systems. AECCOM, another international consultant major, is the General Consultant, assisted by a number of smaller agencies like Parsons Brinckerhoff, Hochtief, TurnerCon, CRN and L&T Ramboh for detailed engineering designs etc. 9 well experienced MRTS ex-IR Chief Engineers from the MRTS Experts Panel for technical guidance, scrutiny & review.

A pioneering effort of this magnitude does require extensive contractual documentation, a process not rendered easy due to involvement of the number of governmental agencies. Reddy detail a series of acronyms for all the documents: RFQ, RFP and RFSP etc. DCA, MSS, RFP, SHA, MSA etc. The contract negotiations had to be based on certain key bases like being ‘technology neutral’, ‘input based and output oriented’, ‘performance specification’, scope for design innovation and reduction in life cycle costs. A key support was the need for builtability of the project that allows for proper development of properties 260 acres. Extensive consultations with all stake holders were critical to make financial closure easier.

Reddy, who started his career as a finance manager with IR, looks back on key components of the negotiation process. The allocation & management of risks is a key to success of a PPP, with the risk to be borne by the party of the three players viz., authority, concessionaire and lender) best able to manage it. He delineates the main risks for the project.

Project risk allocation

Reddy clearly demarcates of risks for a project of this nature.

Authority side: Provision of Right of Way to the Site; Fere and Fare escalation formula prefixed, scope for differential fare, notification; Praising permission from Railways, NH etc for Right of way; Acquisition of lands; Police help during construction; Permiss for utilities (electricity, water, municipal permission etc.); Shifting of utilities.

Commercial risk

No traffic guarantee – extension of Concession Agreement in case of full failure. Management Risk

Concessionaire to hold 51% of Equity up to 2 years from COD; Arm’s length from Govt.; IE supervise & monitor; Change in scope pre-defined; Key performance indicators; Obligations by Government and Concessionaire.

Present status

A steady pace of physical progress has been achieved with over 800 expat & Indian engineers. Surveys, soil investigations & most of the design works have been completed. Work on the selected 15 stations, the precast yard works in full swing, ground works including piee construction works on road commenced in April 2012.

Geotechnical investigation and most of the engineering design works for the other parts of the Metro rail system have been completed. Engineers of the Concessionaire and its various consultancy agencies are working on designs and at several project locations in the city.

Order for gaucermation of coaches (17 coaches, about ₹ 1,800 Cr) has been placed with the Concessionaire on Hyundai Rotem, South Korea, the first supplier for Delhi metro coaches. Rotem won the contract over other reputed companies including Bombardier, Spain’s CAF and China’s CSR.

With the preparatory works having been completed and engineering design work in advanced stage of completion, other ground works are going on at a brisk pace. Depot works at Uppal & Miyapur depots and pillar construction works between Nagole & Metgodina (8 km; stage 1 of the Project) and between Miyapur & SR Nagar (11km; stage 2) are in full swing. So for 139 pillars, 268 foundations and 548 viaduct segments have been completed.

The award of ₹ 700 Cr. signalling and communications systems contract to Thales India has recently been announced. Thales will install communications-based train control and integrated communications and signalling systems on the future Hyderabad. Thales will design, build, deliver and manage the installation of its SelTrac CTST signaling technology.

IR 501-101 package will comprise data transmission, public address, passenger information display, fault reporting facilities, office automation and information technology, CCTV, access control and intrusion detection, master clock, telephony, voice recording and radio tetra systems.

French firm Keolis, an SNCF company, will brand and operate the contract in 2012 to operate and maintain the new metro system for eight years. The international expertise on view in the project should help build Indian expertise and confidence for the future.

CSR efforts

Reedy, given involvement and appreciation of the cities is a core value, leading to HMR initiating a series of CSR efforts, including: mass tree plantation and distribution of free saplings, Hyderabad Bicycling Club and heritage conservation work, creation of three heritage structures i.e., Paigah Palaces, AP State Museum, and MJC Market.

Better planning for suburban services

The Multi-modal Transport Project (MTPS) for Hyderabad is a step in the right direction in addressing some of the issues. SelTrac CTST signalling technology.

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