

Replies to the queries of Mr J.T.Prakash, #70 Lavelle Road, Bangalore-560001, under Right to Information Act.

1. Why was the entire Metro rail System not proposed as an underground system since cost of acquisition is very high and moreover, Bangalore has more than 50%rocky strata, which is conducive for tunneling with minimum encasement?

The underground metro has the following demerits and problems

- Additional cost of the project for 26.30 km of elevated corridor, if taken underground, will be Rs 4707 Crs.making the project more unviable, calling for increased financial assistance and a prohibitive and unaffordable fare structure. Though the properties are not required for corridor, an area of 230mX20m is required for each underground station. Thus for 24 (Elevated) stations an area of 1,10,400 sqm (27 acres) of land is required.
- Even for underground stations, some land is required at the surface for entry / exit arrangements, ventilation shafts, etc. The underground stations spaced about 1 Km about, are constructed by cut and cover method which involves the buildings above the underground portion on the surface to be razed to the ground. Alternate arrangements will have to be made for the building occupiers to shift to other location and also provide relief / compensation for the inconveniences caused/ make up business losses etc. The completion of underground station will take about 3 to 3½ years and due to this long period of disturbance, the building occupiers may not find it worthwhile and attractive enough to come back after this period and construct residential / commercial building and start business again. So heavy compensation may have to be given here also.
- Even in case of underground corridors, for depots huge areas of land on surface is required. This cannot be avoided. Even now out of the total acquisition of 228 acres, 152 acres (66%) is for depots and balance 76 acres (34%) is for stations and at bends.
- Surface corridor is more visible and any undesirable, sabotage activity can be more easily spotted. So underground portions pose more security risks.

- It has to be remembered that in the underground portions, the operation and maintenance costs go up considerably for providing illumination, ventilation, air-conditioning, etc.
- The time and cost of underground construction go up when compared to the elevated construction. Logistics of movement of materials and disposal of muck become much more difficult. Safety precautions and measures will have to be of higher order.
- Land acquisition in the elevated portions is only at elevated stations, bends and depots as the corridor mostly follows the road. No acquisition on surface is involved for most of the corridor. Also 88% is Government lands and private lands are only about 12%. So cost of acquisition is also low.
- Even now, the 6.70 km underground tunneling is planned with concrete lining of minimum safe thickness.

Hence considering all the above issues, Bangalore metro is being constructed as 'Elevated corridor' in most of the reaches and in underground only in Central Business District, where it is not possible to put up elevated structures. The project implementation is as per approval given to the DPR by Government of Karnataka and Government of India, the joint promoters

2. What is the total cost including acquisition for Elevated and Underground type of Metro?

The cost of Bangalore Metro is estimated at Rs 157 Crs/km for elevated and Rs 336 Crs/km for under ground including property acquisition, escalation, interest during construction etc.

3. Why the 'Standard Gauge' has been proposed when the entire country has adopted/converted to Broad Gauge.

Standard Gauge has been adopted for Bangalore Metro for the following main reasons.

- It is a stand alone system

- City roads narrow with very sharp bends. Building line very close to the roads.
- Signaling of mainline and Metro are entirely different.
- Inter-operation of trains not possible, even if it is Broad Gauge
- SG permits sharp curves with min radius of 120 m resulting in less property acquisition. Land & properties are prohibitively expensive in Bangalore.
- Overall length of turnouts on SG is less resulting in shorter yard length and saving in costly land acquisition in the urban areas.
- SG Metro with 2.88m wide coach adequate to cater to the required PHPDT of 40,000. Coach width & Gauge should complement each other for optimum utilization of resources.
- SG axle load and gross weight are less resulting in savings in infrastructure & recurring energy cost.
- Adopting BG increases cost of project with no concomitant benefits
- As most of the Metros world over operate on SG, benefits of continued technological up gradation would be readily available
- All Metros that have come up during the last decade world over operate on SG except Delhi Metro.
- Majority of countries have SG for their Metros albeit a few of them have different gauges for their mainlines

4. *What is the rate of interest on loan approved by Karnataka Government?*

The share of Government of Karnataka and Government of India for this project is 30% and 25%. Out of Balance 45%, 30% of the loan will be taken by Japan Bank for International Co-operation(JBIC) @ 1.30% interest and remaining 15% will be raised from domestic financial institution.

5. *Copy of agreement entered into with Financial Institution.*

As on date no agreement has been entered in to with Domestic financial institutions. The external funding is being done by JBIC for which necessary agreement has been done by Government of India and Government of Japan.