Bangalore can't have underground railway

City's geology leaves no scope for one, states special study

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BANGALORE: The promoters of the Elevated Light Rail Transit System (ELRTS) have received a shot in the arm with a geotechnical study ruling out the possibility of an underground metro rail system in Bangalore.

The study, conducted by L&T Ramboll, Chennai, and commissioned by the Bangalore Mass Rapid Transit Ltd (BMRTL), has revealed that Bangalore's subsurface geology does not suit an underground rail system. This revelation has effectively laid to rest all disputes concerning the implementation of the ELRTS.

The report, made available to *The Times of India* on Thursday, states that the city's sub-surface profile shows large variations in thickness of subsoil layers.

According to the study, the cost of constructing an underground rail system will be four to six times that of making ELRTS possible. The study also states that the ELRTS can be completed much faster.

A study of Bangalore's geological conditions has revealed the following facts:

An artist's vision of the Bangalore Elevated Rail Transit system on M.G. Road in Bangalore.

- The geology consists of a top few metres of silty sand. In some areas, the top soil consists of clay silt within layers of stiff clay.
- Weathered rock is seen at relatively shallow depths; at many locations, the thickness of the layers varies from 0.5 metre to 18 metres.
- Hard granite with occasional pieces of amphibiolite is seen below the weathered rock.
- No rock of sedimentary origin was seen. Hence, soft rock was not encountered in any of the bore holes dug during the study.

L&T Ramboll said if the authorities went in for an underground rail system, excavations through weathered rock would be difficult. Minor blasts would have to be resorted to. Weathered rock and stray boulders are not self-supporting and excavations would require extensive shoring.

"At locations where hard rock appears at shallow depths, there is no alternative to blasting. Blasting would result in vibrations, which would affect the structures nearby. This is not advisable because the alignment traverses through the busiest stretches in the city," the report observed.

"The minimum depth required for the rail track portion would be 10 metres, and that for a station 15 metres. At these depths, the rock would invariably be weathered and hence excavations would be difficult," the BMRTL- commissioned study noted.

An underground metro will involve either a cut-and-cover method or a bored tunnel. Bored tunnels through weathered rock will require additional support measures in the form of rock bolting or steel arches. This would further escalate the already high cost of construction, the report stated.

"In areas where the water table is high, seepage through soil and weathered rock would be excessive."

"Although an underground metro has an inherent advantage of occupying very little or no surface space, Bangalore's geology would make this proposition exhorbitantly expensive and difficult to execute," the report added.

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