

Hebbal tunnel could create new choke points, trigger queues inside tunnel: IISc study

Published – August 26, 2026 09:21 pm IST – Bengaluru

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The study has found that the short tunnel would provide only localised relief, with congestion continuing on the roads before vehicles enter the tunnel and after they emerge from it. | Photo Credit: ALLEN EGENUSE J.

The under-construction 2.2-km short tunnel between Hebbal flyover junction and the Veterinary College may ease congestion at Hebbal Junction, but it would only shift traffic jams to choke points near Veterinary Hospital and Esteem Mall, according to a new study.

The study, conducted by Ashish Verma, convener of the IISc Sustainable Transportation Lab (IST Lab), found that the short tunnel would provide only localised relief, with congestion continuing on the roads before vehicles enter the tunnel and after they emerge from it. An underground metro is projected to bring a much sharper reduction in traffic pressure across the network.

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The study was submitted to the Governor on Wednesday.

As part of the study, the six-lane tunnel was assessed against an underground metro alternative for 2027, 2031, and 2041. The study compared the existing roads with scenarios in which the tunnel or metro is added.

To compare three scenarios — Business as Usual (BAU), BAU with the short tunnel, and BAU with a metro instead of the tunnel, the study used a four-stage travel demand model. It measured the impact using the Volume-to-Capacity (V/C) ratio — a measure of how much traffic a road is carrying compared with what it can handle. A ratio below 1 is generally desirable, while a ratio above 1 means traffic demand exceeds available capacity.

Under the existing road network, the report said that the traffic demand is already several times the available capacity at some points. For instance, the V/C ratio at Hebbal Junction for traffic towards the airport is projected to reach 2.42 by 2041. In the opposite direction, at the tunnel entry, it is projected to reach 3.31.

The study found that the entry/exit points would have the same V/C ratios even after the project is implemented, suggesting that vehicles may move faster through the tunnel but would still encounter the same capacity constraints once they reach its ends. This, the study said, could create new choke points and that the resulting queues could spill back towards Hebbal Junction and Mekhri Circle. In the Bengaluru-bound direction, the queue could eventually extend into the tunnel itself.

The study pointed out that the intervening stretch would continue to operate at Level of Service ‘E’ for Bengaluru-to-airport traffic, while the opposite side and the tunnel entry and exit could remain at Level of Service ‘F’ - both indicating highly congested or breakdown conditions.

Metro, the study highlights, gives a much bigger reduction and produced a dramatically different result in the study. With the Metro, the V/C ratio at Hebbal Junction for Bengaluru-to-airport traffic is projected to fall to just 0.05 in 2027, compared with 1.06 with the tunnel. In the opposite direction, it falls to 0.03 compared with 0.82 under the tunnel scenario.

The study said while the tunnel creates more road capacity over a short stretch, the Metro can reduce the number of vehicles using the road in the first place by shifting commuters from private vehicles to public transport. The proposed Metro connection would also help passengers using BMRCL’s Line 3A reach the airport, the study said, pointing that tunnel costs six times more per passenger and that cost comparison also favours Metro.

The study also questioned the DPR’s assumption that 50% to 80% of traffic would shift to the tunnel. It says these diversion figures are arbitrary and are not backed by standard empirical methods such as commuter preference surveys or a comprehensive assessment of capacity across the corridor.