Notification No.               :        COE/Ph.D./(Notification)/248/2023

**Date of Award/Notification  :        06-11-2023**

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**Topic of Research            :        Performance Optimization of Urban Metro Transit System**


### FINDINGS


1.      The perception responses revealed that users are generally satisfied in terms of overall acceptance of Delhi Metro in terms of efficient PT system with good security and safety both at stations and coaches. The perception index of such parameters ranged between 7-9 out of 10. This had impacted the acceptability of Delhi Metro in positive manner had attracted the commuters. However, the positive perception towards functional and operational performance indicators and financial and economic performance indicator was quite low. The corresponding values for Blue line are 5.26 and 2.99 respectively. The values for Violet line were 6.66 & 3.30 and for Magenta line are 5.77 & 2.76 respectively which revealed a gap in efficient functional & operational system and unsatisfaction towards fare.

2. The descriptive analysis revealed that commuters are mostly satisfied with frequency, speed of Delhi Metro whereas a significant proportion reported 156 unsatisfaction towards delays due to unexpected stoppage and breakdown. The mean access-egress time for all the three lines was in the range of 12-13 min. and 11-13 min. respectively. For all the three lines the mean transfer time to reach concourse from station entry was in the range of 7-9 minutes whereas the mean transfer time to reach exit of station after deboarding was in the range of 4-5 minutes. The mean transfer time of interchanging of metro lines was in the range of 6-8 minutes. The results indicated that the ratio of (access time+egress time)/MHT was 0.58, 0.594 and 0.509 for Blue, Violet and Magenta lines respectively which was quite high. The above information revealed that main issue lied outside metro system in form of OVTT and transfer times.

3. The average access-egress distance was found to be considerable, which posed a barrier to the use of the Delhi Metro as a PT mode. The three lines' average access and egress trip distances were 1.8 km. and 1.72 km. respectively and their average access and egress times were 11.85 minutes and 11.96 minutes respectively. With an average main haul time of 42.36 minutes, the median and average main haul distances across three lines were 12–21 km and 21–19 km, respectively.

4. It was important to note that a significant proportion over 28% and 43% of respondents reported an increase in their total travel time by 15-30 minutes and 0-15 minutes between the same origin-destination using Delhi Metro post-COVID-19 respectively.

5. The interconnectivity ratio noted for Blue, Violet and Magenta lines is 0.312, 0.289 and 0.274 respectively. The Running Index value noted for Blue, Violet and Magenta lines was 0.794, 0.761 and 0.752 respectively whereas the Level of Service value noted for Blue, Violet and Magenta lines was 0.775, 0.751 and 0.718 respectively. These high LOS values makes the entire metro system less attractive due to high OVTT with respect to IVTT. One of the potential causes was the poorly planned access and egress facilities, as most stations lack designated parking areas for access-egress mode.

6. The Service Time Ratio of 0.114, 0.143, and 0.153 for the Blue, Violet, and Magenta lines, respectively, showed that time is spend in waiting and transfer areas. As a result, the concourses for the transfer areas may be redesigned to save passengers' time during peak hours. The Passenger Waiting Index value noted for Blue, Violet and Magenta lines is 0.868, 0.976 and 0.666 respectively which was still higher than desired.

7. The average access and egress trip fare for the Blue, Violet, and Magenta lines, respectively was Rs. 27.15, Rs. 34.52, and Rs. 38.58. The average main haul fare per trip was Rs. 40. Consumers were noted to spend more than Rs. 73 on each journey between the starting point and the final destination. It was further inferred that the consumer spent roughly Rs. 150 on round trips every day.

8. It was observed that decreasing order of satisfaction factors influencing the performance of the Blue line was efficient service/service availability, infrastructure & comfort, passengers ease and comfort, seamless connectivity and financial & economics. The increasing order of the sub factors influencing seamless connectivity needed smaller number of interchanges, needed an easy network and a greater number of metro trains in the network. The increasing order of the sub factors influencing passengers ease and comfort was ease of standing space in metro coach, ease of seating space in metro coach, lesser egress distance and time. The increasing order of the sub factors influencing infrastructure and comfort was ease of parking facility offered by Delhi Metro and ease of ticketing/token at stations. The increasing order of the sub factors influencing efficient service/service availability was frequency of trains, time required to deboard the train and exit from the station (transfer time3), time required to enter in the station to board the train (transfer time1). The increasing order of the sub factors influencing Financials and Economics was total fare per trip, metro fare was high comparing other PT, metro fare per trip and access & egress fare per trip. The increasing order of critical subfactors of operator KPIs influencing the performance of Blue line was Service time ratio (STR), Level of service (LOS), Running Index (RI) and Total travel ratio (TTR). It was very interesting to note that other two lines Violet and Magenta have significant different satisfaction factors and subfactors influencing the performance of the respective lines. It gave a very vital insight that the three lines had different user satisfaction factors which influenced the metro performance. Further, the three lines had different set of issues, challenges and set of possible and suitable remedial measures.

9. Few remedial measures may be explored to improve the performance indicators like common mobility card, redesigning and provision of parking facility for accessegress modes, design modifications of concourse area to reduce waiting and transfer lag. Rationalization of metro fare specifically for short MHD was noted to be critical for sustained metro performance