CHAPTER EIGHT

SUMMARY, CONCLUSION & RECOMMENDATIONS

The introduction of the metro rail service in Delhi has changed the face of transportation in the city. Specially designed keeping in mind the comfort of the passengers and the traffic on the road the metro rail services in Delhi have been appreciated all over the world. As expected the metro railway network has almost covered the entire city and with continuous endeavours of expansion most of the neighbouring areas and suburbs will be covered by the metro railway by the end of 2020.

The metro service, which has come as a boon for the people of the city, is expanding in leaps and bounds. The best thing that has happened since the introduction of the Delhi metro is the reduction in the city’s traffic and pollution level. Expansion plans of the Delhi Metro started especially for the 2010 Commonwealth Games. After the Commonwealth Games were over the construction of other important lines are still under progress and three new lines have been recently added.

Delhi Metro as a commercial organization operates with the objective of maximizing the profit. Only Phase I and Phase II have been considered for this study. The relevant cost and revenues data has been obtained from the annual reports of the Delhi Metro. In order to conduct the CVP analysis, certain assumptions were made with the help of data provided by Delhi Metro. While Delhi Metro incurs a day-to-day O&M cost, the major portion of the investment is the infrastructure cost which is a one-time fixed investment. Delhi Metro earns revenue from traffic earnings, real estate, and external & consultancy projects. With increase in connectivity, Delhi Metro expects a continuous increase in traffic earnings annually. These numbers are projected based on the trend of the last few years. While Delhi Metro is able to cover its O&M cost from its annual revenue, it will take some time to cover the huge initial investment cost. A detailed analysis of the projected costs and revenues has been done and it is projected that Delhi Metro will achieve its breakeven point in the year 2037.

At the Break-even Point, the annual ridership of Delhi Metro will be 154.59 crore and revenue will be Rs. 15204.97 crore. Thus, from a purely financial point of view, Delhi Metro is a feasible investment.

Another section of the study focuses on analyzing the factors which are influencing people towards Delhi Metro. For this, a questionnaire was framed and administered to 650 respondents out of which 601 were valid responses. The questionnaire was given to all age group commuters comprising of both males and females. Factor analysis was done on the filled questionnaires through SPSS software to extract the most important factors. There were 41 items, each item was a variable which were counted as a individual factor
important for commuters. After running the SPSS software, these 41 items were clubbed into 9 factors which were considered important along with their weightage.

These factors were:

1. Travelling Convenience which explained 10.632% of the variance, which included sufficient seating arrangements for commuters, reduces overall time of journey, escalator available at stations, easy parking facility, and adequate feeder bus service and is economical mode of transport.

2. Facilities for Commuters which accounted 10.453% of variance, like proper mobile network, good lost and found services, maintains good standards of cleanliness, and AC in the coaches are very effective.

3. Safety Measures for Commuters which carried variance of 9.957%, which included route maps are well displayed, proper lighting in the coaches and at stations, separate coaches for women, frisking at stations give commuters the feeling of safety, and CCTV cameras at stations have full control check.

4. Ease of Travel (9.777%). These included seats are reserved for senior citizens, seats are reserved for handicapped people, and announcements are made both in English and Hindi language, and have proper sheltered areas for waiting.

5. Automates Services which contributes 8.115% of weight age. The examples of this factor included smart card facility, automatic fare collection system, display screen in the coaches, provides correct information and automatic doors are very convenient.

6. Extended availability which carried variance of 5.111%, like Delhi Metro is available on weekends.

7. Connectivity which carried weight age of 5.099%, which included connectivity to airport which makes ease to commuters, and stations are near to their homes.

8. Friendly Staff which accounted 5.074% of variance. Like, staffs is friendly and informative, there are sufficient number of token counters at the stations.

9. Frequency (3.480%) which included frequency of Delhi Metro is sufficient and less prone to breakdown.
Next, was to analyze the influence of demographics characteristics of consumers on their preference towards Delhi Metro.

For demographics more than two categories like age – One Way ANOVA is applied to test whether there is significant difference between mean scores of various categories. Independent sample t-test is used for comparing the difference between the groups of gender i.e. Males and Females.

With the ANOVA test, result was that travelling convenience and automated services differs significantly on the basis of age. Further, with the post hoc analysis, it was reflected that people in the age group of 18-30 years give more importance to travelling convenience and automated services as compared to their older counterparts.

Now, Independent sample t-test was to run to compare the preference of using Delhi Metro between males and females. This test revealed that metro offers convenient, comfort and safe mode of travel to people. It helps in saving the time of the commuters. As such there is no major difference in the reasons which push males or females to use Metro instead of other modes of transportation.

Having already looked into the financial costs and benefits, we next delved into the social benefits provided by Delhi Metro to the commuters & the general population of Delhi city. With the coming of Delhi Metro there has been a drastic reduction in the number of vehicles on road. In 2011-12, it is estimated that 97493 cars and jeeps have gone off the road because of people shifting to Metro. Similarly, it is estimated that 458116 two-wheelers and 2871 buses have been taken off Delhi roads as the commuters shift to Delhi Metro. With the reduced traffic on roads, there has been reduction in the travelling time of the commuters. There has been savings of travel time of passengers travelling by the metro instead of by road & for those also who all are travelling on roads because of decongestion on roads. We estimate the monetary value of this time saved to be Rs. 4105 million.

Another social benefit arrived with the coming of Delhi Metro is savings in fuel consumption. There are savings in fuel consumption (inclusive of both CNG and petrol) due to diversion of a part of the Delhi road traffic to Metro and reduced congestion for the vehicles still operating on the roads. There is an inter-fuel substitution of petrol and CNG to electricity that result in savings of foreign exchange and reduction of air pollution. Overall, there is an estimated total savings of Rs. 1981 million due to reduction in fuel consumption because of decongestion.
The next social benefit is reduction in air pollution. Fewer vehicles and the decongestion for the residual traffic on Delhi roads due to Metro lead to reduced air pollution. In monetary terms, there is a saving of Rs. 19 million because of reduction in pollution due to diverted traffic.

Another important benefit for commuters is fewer accidents. Less number of vehicles means fewer accidents. The monetary value in savings due to fewer accidents and total savings in compensation paid due to fatalities, injuries and damage caused to vehicles is estimated to be Rs. 216 million. So, while the commuters have to bear the extra cost of travelling in Metro as compared to buses, Delhi Metro provides a lot of social benefits which compensate for it. Similarly, the government’s huge upfront investment in infrastructure will not only provide a solution to the problem of congestion on Delhi roads but will also help in reducing its Current Account Deficit by lowering its fuel import bill.

Having analysed Delhi Metro from both economic and social standpoint, it is safe to say that Delhi Metro is indeed a jewel in the crown of Delhi. However, similar studies need to be done on the upcoming phases of Delhi Metro. With new regulations coming with regards to diesel vehicles and Delhi government’s Odd-Even policy, Delhi Metro will get a new push in increasing its ridership. Its impact needs to be studied in further details.

The factor analysis suggests that the young population gives a lot of importance to travelling convenience and automated services while choosing their preferred mode of transportation. Delhi has a large population in the age-groups of 18-30 (with a lot of migrant population in search of better jobs and better lives), Delhi Metro should use this population dividend to its advantage by continuing to innovate and adapt latest technology. Extending Delhi Metro’s service through the night, running an express service, recharging Smart cards online etc could be some important steps in that direction. With the current government’s emphasis on Digital India, Delhi Metro should try to remain on the forefront by launching and upgrading Metro tracking apps, providing Wi-Fi services at the stations and in its coaches. Delhi Metro can also earn a very loyal set of commuters in terms of elder commuters if it provides better sanitation and toilet services in its coaches.