ASSESSING METRO RAILSYSTEM AS A MEANS OF MITIGATION STRATEGY TO CLIMATE CHANGE

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Foreword

Bengaluru famed as the garden city has gained global acclaim for development in Information technology and Biotechnology. Due to its fast development and urbanization in recent years, the city, which was an air conditioned city around two decades back has slowly warmed up and with exponential increase in automobiles in the city roads, it has also gained the tag of being a highly polluted city. To reduce the vehicular density and increase the commuter comforts and also to bring in climate resilience in the city, the first Metro rail project in Bengaluru was planned in two corridors. The East-West Corridor (18.10km) from Baiyappanahalli (East) - Mysore Road (West) was commissioned in 2016. As per The Times of India report, August 4th, 2017, Bengaluru Metropolitan Transport Corporation (BMTC) has seen a drop of 2-3% in its revenue after Phase 1 of Namma Metro became fully operational in June, 2017. The Metro ridership has also increased to 34% from June 2016 to July 2017.

The study entitled, "Assessing Metro Rail System as a means of Mitigation Strategy to Climate Change" conducted by the Centre for Climate Change in EMPRI during 2016-17 has assessed the utility and benefits from a commuter perception angle especially with reference to the economic and social perspectives. The commuter's methods of reaching to the station are also evaluated. Time saved in travel and reduction in exposure to polluted air in the road are the major gains but there are some teething problems in relation to last mile connectivity. Through GIS the buses plying from different metro stations in east west corridor to majestic and other stations are mapped to depict the extent of connectivity to the metro station. The analysis of commuter perceptions points to many of the benefits of metro rail and at the same time pointing out some of the aspects which needs further facilitation for realizing the full potential of this venture both from a public facility aspect and a climate friendly initiative for the fast growing city of Bengaluru. EMPRI deserves appreciation for conducting such timely studies to analyze the relevance and reliability of such developmental initiatives in the Bengaluru city.

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Preface

EMPRI being the nodal agency for climate change in the state is endeavouring to tackle current environmental issues by analyzing the background, identifying current realities and finding feasible solutions for recommending policy actions. The most important environmental issue confronting us currently is the climate change which affects all sectors of life. It is scientifically established that emissions of greenhouse gases by anthropogenic activities play a major role in climate variability and climate change. In cities like Bengaluru, the emissions by automobiles are increasing day by day and pollution levels are very high with increased concentrations of green houses. BMRCL has established metro rail in the city in 2016 connecting the east west corridors. EMPRI has initiated many climate change projects under the support of the Govt of Karnataka schemes and Department of Science and Technology programmes during 2016. The project "Assessing Metro Rail System as a means of Mitigation Strategy to Climate Change" is one of the important projects which was undertaken with the objective to assess the socio-economic aspects of this mass transit system.

The basic objectives of metro rail are to reduce the traffic congestion and reduction of pollution and greenhouse gases. In the survey based study, the commuter's perspectives were assessed through a structured questionnaire using specific factors related to transport sector. The survey covered around 1059 passengers across 17 metro stations along the East-West corridor of the Metro rail. Ninety five percent of the commuters stated that Metro rail is the most convenient mode of transportation in Bengaluru city. Factors such as connectivity, frequency and parking facility are the major areas that require improvement. The GIS mapping of the BMTC networks from the metro station reveals the connectivity status, which may help in policy decisions to expand the utility of metro rail services. This study indirectly indicated that usage of metro rail as against other modes of transport can serve as an effective strategy to reduce emissions of many Green House Gases and thereby mitigate climate change to a great extent. In this study, we could not estimate the real reduction in pollution and emission reductions as it requires more quantified information on the current levels of pollutants and GHG gases in the city. More intensified studies are required to make precise computations and interpretations. However, this is a curtain raiser study giving first hand information on the maiden venture of introduction of metro rail in Bengaluru city which has very high prospects as a measure for climate change mitigation. It is expected that this survey based study will reveal the realities and potential of this progressive venture of the government for further expansion and creation of a climate smart Bengaluru city.

Smt.Ritu Kakkar, IFS
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Executive summary

The metro rail commuters were surveyed about their satisfaction with various features of rail services, including mode of transport, frequency of usage, preference of public transport, cost and travelling time, traffic flow, parking facility, safety aspects, areas of improvement, pollution, health and significant aspects of metro. Ninety five percent of the commuters opined that Metro rail is the most convenient mode of transportation in Bengaluru city. There was 68% reduction in travel cost after shifting from a previous mode of transport to the metro rail. These figures were supported by increase in ridership figure to 34% from June 2016 to July 2017. Forty three percent of the commuters said that the travel cost was reduced by Rs.21-50 per trip. Ninety nine percent of the commuters stated that using Metro rail reduces travel time when compared to other means of transport. Commuters who use metro rail daily or occasionally opined that there was 100% safety while travelling in metro rail. Another significant aspect of the survey was that about forty one percent of the commuters reach metro station by walk. As per this, there are more number of commuters opting to walk rather than use a vehicle to reach the metro station. Sixty percent of the commuters travelling occasionally stated that there was partial reduction in vehicle density after introduction of the metro rail. Most commuters (96%) opined that they did not experience any health related issues while travelling in metro rail. Fifty five percent of the commuters mentioned that there was partial reduction in pollution levels and 48% opined that there was partial improvement in air quality after introduction of metro rail. A greater proportion of the commuters (65%) opined that there was improvement in flow of traffic of Bangalore city after introduction of metro rail. Overall, aspects such as connectivity, frequency and parking facility are the major areas that require improvement. This study serves as a preliminary investigation to know the commuters perspective on metro rail services and would help us to understand the probable increase in projected ridership in the future.

Metro has become preferred choice for daily commuters due to the fact that it can avoid urban traffic and timely transport to destinations. From the environment point of view metro is serves as Green Mass Rapid Transit System (MRTS) and low-greenhouse gas emitting vehicles Technology. The increase in users of MRTS demonstrates reduction in GHG emissions from road transport. However, public can use metro services only if the

outermost last mile destinations are easily and directly accessible to metro stations. Issues with connectivity from home or destinations to access metro can lead to choice of modal shift from metro to road transport, thus increases vehicular traffic and pollution. In this regard, last mile connectivity study is undertaken to evaluate the last mile problems.

"Last mile" has also been used to define the difficulty in getting people from a transportation hub to their final destination. When users have difficulty getting from their destination to a transportation network, the scenario may alternatively be known as the "last mile problem". In this study, the problems associated with last mile connectivity of Bengaluru's Mass Rapid Transit System named as "Namma metro" is evaluated using geospatial techniques.

The study comprehends evaluation of Last mile connectivity through analysis of metro station wise connected Last mile destinations, number of buses operating in the metro station nearest bus stops, total distance covered by buses, number of wards which can access metro services, the density of buses in different stretches of the transport route.

Geospatial tools related to network analysis and Survey123 for ArcGIS field data collection mobile app are used in achieving the objectives of Last mile Connectivity analysis. The GIS database is prepared with spatial layers such as Metro rail route, Metro stations, Metro station Bus stops, Bus routes, Destinations, Road network, Route density with necessary attribute information of Bus numbers, spatial location, running length, Bus stop names, Bus route numbers, origin point names, destination point names. Using the outputs of all the above mentioned analysis the Last mile connectivity is evaluated.

1. INTRODUCTION

Among the innumerable issues being faced by metropolitan cities across the world, air pollution is of utmost concern that has been aggravated by developments such as rapid industrialization, high influx of population to urban areas, unplanned urban development, increasing traffic, rapid economic development and higher levels of energy consumption (SoER India, 2011). Currently, in urban areas air pollution is widespread as vehicles are the major contributors to the atmospheric pollutants. Vehicular emissions are of particular concern, since these are ground level sources and thus have the maximum impact on the general population (SoER India, 2011). Similar issues are being faced in Bengaluru and the solution to the problem is an efficient public transportation system.

Bengaluru is one of the fastest growing cities in India and expanding vastly in all directions (Kashyap, 2011). The city houses many of the reputed Information Technology companies and is known as Silicon Valley of India. As a result of larger floating population with increasing existing population of the city, there has been increase in vehicular population adding to extreme congestion and air pollution on the city roads. Mumbai with a population of 18.41 million has 25.71 lakhs vehicles registered whereas Bengaluru with a population of 11.5 million has 67.22 lakhs vehicles registered. Bengaluru, with one third the population of Mumbai, has 62% more vehicles registered. Thus, an efficient and reliable public transport system is the way forward in tackling the issue. Hence, the mass rapid transit system was implemented in the year 2011 by Bengaluru Metro Rail Corporation Limited (BMRCL). Main objective behind introduction of metro rail in Bengaluru was to ease the traffic pressure off the roads. The mass rapid transit system (MRTS) was encouraged, so that commuters could start using public transport more and more, instead of using private vehicles. Metro rail system in the city is considered to be a complementary transit mode rather than a competitive one (Map Unity, 2017). In this context, the present study was taken up to assess the metro rail system as a means of mitigation strategy to climate change.

Mass rapid transit system projects like metro rails are expected to improve traffic and road safety conditions (reduced vehicular traffic, traffic congestion, road accidents etc.) and environmental conditions (air and noise pollution) in urban areas (Sharma et al

2010). Therefore, the present study was conceived to assess the overall potential and efficiency of the metro rail in terms of easing the traffic scenario in Bengaluru city through commuter perception. The use of metro services by public is known to decongest urban traffic. Public can use metro services when the outermost destinations are directly accessible to metro stations. Issues with connectivity from home or destinations to access metro can lead to choice of modal shift. In this regard, last mile connectivity study is undertaken to evaluate the last mile problems.

"Last mile" is described as the movement of public and goods from a transportation centre to a final destination such as home or workplace. This is usually used in telecommunications, supply chain management and transportation planning describing the transportation efficiency. "Last mile" has also been used to define the difficulty in getting people from a transportation hub, especially railway stations, bus depots, and ferry slips, to their final destination. When users have difficulty getting from their starting location to a transportation network, the scenario may alternatively be known as the "first mile problem". Vice versa Last mile problem refers to difficulty getting conveyance from transportation network to the user's destination. This problem can be evaluated using Last mile Connectivity analysis using geospatial techniques.

This study is taken up to evaluate the Last mile connectivity of Bengaluru's Mass Rapid Transit System named as "Namma metro". The study encompasses various aspects of Last mile connectivity such as metro station wise connected Last mile destinations, number of buses operating in the metro station nearest bus stops, total distance covered by buses, number of wards which can access metro services, the density of buses in different stretches of the transport route.

A wide range of Geospatial tools and GIS based data collection mobile app are used in achieving the objectives of Last mile Connectivity analysis. Several GIS layers such as Metro rail route, Metro stations, Metro station Bus stops, Bus routes, Destinations, Road network, Route density are created progressively containing necessary attribute information of Bus numbers, spatial location, running length, Bus stop names, Bus route numbers, origin point names, destination point names and eventually the Last mile connectivity is evaluated.

1.1.   **Need for the study**

With increasing traffic congestion coupled with unprecedented growth of private vehicles, road accidents and issues of road safety and increasing air pollution, the urban planners and policy makers consider metro rail project as inevitable for efficient transport system in urban environment. In this context, the focus of the present study was to assess the overall performance of the Metro Rail in terms of its impact on easing the traffic congestion, reduction in vehicular count, accessibility options and its influence on commuters. The findings can be useful for improving ongoing metro rail services in the study area and other metropolitan cities.

1.2.   **Objectives**

The objectives of the current study are as follows,

1) **Evaluate the socio-economic and environmental impacts of introduction of mass rapid system on the commuters of the Metro Rail in Bengaluru city** – The survey was undertaken with an intent to understand the behavioural attitudes and perceptions of the metro rail commuters. The opinions and suggestions obtained as part of the study would be formulated as recommendations to Bengaluru Metro Rail Transport Corporation (BMRCL).

2) **To evaluate the last mile connectivity from the metro rail system and accessible BMTC bus stops from metro stations.** The last mile connectivity analysis would provide details of the well-connected and less connected localities of Bengaluru city. The outcome of the analysis also provides the total coverage of bus routes, last mile destinations, density of buses, possible stretches of routes which can be analysed to reduce traffic congestion, pollution and Greenhouse Gases.

1.3.   **Limitations of the study**

The limitations for this study are as listed below,

1) As the sample size for the survey was 1067, it is not necessary that it truly represents the complete commuter population.

2) Few commuters have not given an accurate response, which affects the results of the study.

3) Some commuters have not responded to all the questions and hence, those questionnaires were discarded.

4) This study has been carried out for only BMTC transport. However, it is also necessary to consider other modes of public transport and private transport which are operating in the vicinity of metro station bus stops.

5) The frequency of buses and number of trips by BMTC and occupancy of commuters of BMTC needs to be considered for detailed research in analysing time based density of buses operating in the congested routes.

6) The two metro stations Kempegowda Station and Sir M Visveswaraya Station were not considered in this study since they are located in the central part of Bengaluru city where the bus stops in 500m buffer zone operate and cover almost complete Bengaluru.

7) Traffic diversion limitations such as one-ways, narrow roads and shorter paths are not considered in this study. This may lead to longer passenger trip route by BMTC or sometimes even shorter routes achieved by walk or private transport to reach last mile destination.

1.4. Transportation scenario in Bengaluru

1.4.1. Growth of Motor Vehicles

The vehicle population in Bengaluru started growing rapidly since later part of 1980's. It has always known to have more two wheeler users. With the rapid growth of Information Technology sector in Bengaluru, the affordability of larger segment of employees increased for ownership of vehicles, more so for two wheelers. Coupled with inadequacy of comfortable and efficient public transport system, more and more commuters shifted to cars and two wheelers for their commuting in the city. As a result, there has been unprecedented growth in the vehicle population in the city. The growth of motor vehicles is shown in Table 1.1. The number of registered motor vehicles has reached 61.12 lakhs in the year 2016 and the increase in number of vehicles during the last 10 years has been found to be about 33.51 lakhs. The two wheelers, constituting about 69% of the total registered vehicles (in 2016), have grown at an average rate of about 10% per annum during the last few years. Lately, growth rate of cars have been found to be faster (19%) than two wheelers. The trend is likely to continue. This will result in

higher usage of private modes of transport unless extensive and convenient public transport system is provided (CTTP, 2011).
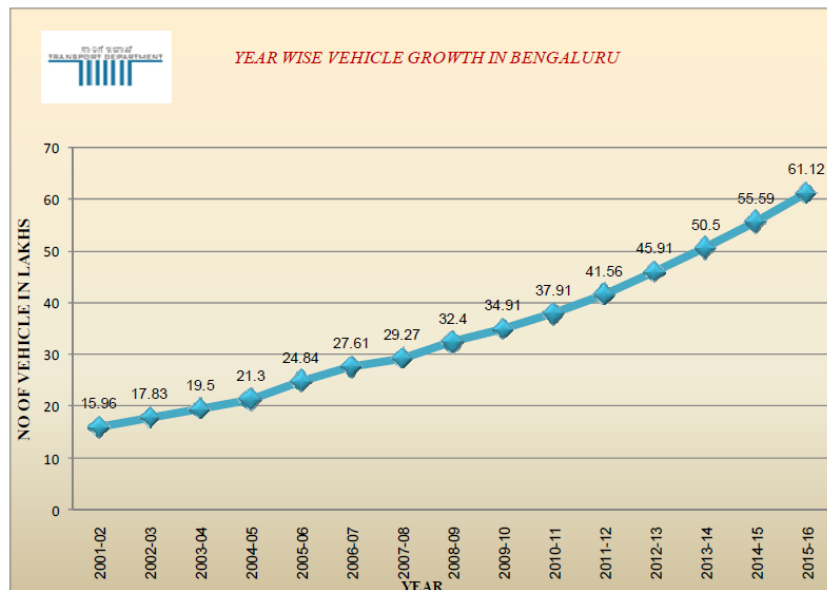
Figure 1.1 Vehicle growth in Bengaluru

Source: Annual report 2015-16, Transport Department, GoK
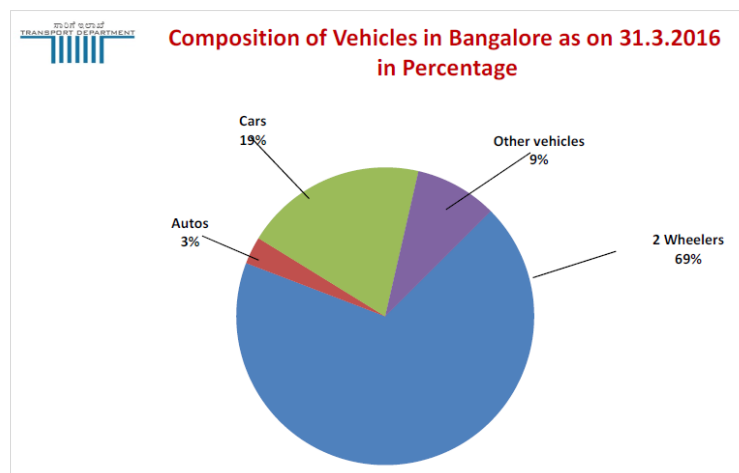
Figure 1.2 Composition of vehicles in Bengaluru

Source: Annual report 2015-16, Transport Department, GoK

1.4.2. Public Transport System

Buses, auto rickshaws and taxis are the various modes of transport available in the city. Bengaluru Metropolitan Transport Corporation operates the buses with a fleet size of 6,159 buses as on March 13, 2017 (BMTC 2017). Since the city is expanding in all directions, and roads are already congested, buses alone are not capable of coping with the heavy commuter demand. Buses carry about 2.4 million passengers per day

i.e., modal share of about 45%. But bus service is not adequate and it is overcrowded and not fully reliable for commuters (CTTP, 2011). Hence, an efficient public transport system is required to ease the traffic scenario in Bengaluru. Rail based MRTS are generally characterized by high efficiency, high volume capacity transportation through low levels of energy usage and minimal land requirements.

1.4.3. Issues of Urban Transport in Bengaluru

Bengaluru city has seen exponential growth over the last 50 years. In the year 2001, the city's population crossed 5 million and as a result the city has expanded horizontally. In the last three decades, the vehicular population is growing at an average rate of 25% per annum. While the population and number of vehicles have increased by several folds, expansion of roads has not kept pace in core areas of the city. This has resulted in traffic congestion and low vehicular speed (DPR, 2003). Various other factors have led to transport problems in the city. Narrow roads heavily congested with a mixed type of traffic, and no widening of the roads, no laying of new roads to accommodate newer vehicles, frequent traffic jams at road intersections are some of the major issues of concern. Seventy five percent of the composition of traffic consisting of low occupancy vehicles, large number of two-wheelers and three wheelers causing heavy air and noise pollution, high parking demand due to proliferation of personalized vehicles, overcrowded buses with long routes and slow average speed 10-12 Km/hour on roads, high atmospheric pollution levels and high rate of road accidents are among other unaddressed issues (CTTP, 2011).

1.5. Scenario of Air Pollution in the City

The air pollution levels in the city are quite alarming. Official ambient air quality monitoring has shown 57% increase in particulate matter (PM10) in just 4 years (2010-2014) and 23% in one year (2013-14- 2014-15). The NO_x levels, though generally low, have also begun to increase. In more than 85% of monitoring locations the levels have exceeded standards. Center for Science and Environment (CSE) exposure monitoring has provided clinching evidence of alarming dose that an average Bengaluruan breathes on a daily basis in different parts of the city – 3 to 12 times higher than the ambient level recorded by official monitors.

As per the 2016 monitoring data by Karnataka State Pollution Control Board (KSPCB), the measured SO_2 values were well within the national limit (50.0 µ g/M3) in all 16 monitoring locations of Bengaluru city. The measured NO_2 values were well within the national limit (40.0 µ g/M3) in all measured places except at City Railway Station. The measured PM10 values have exceeded the national limit (60.0µ g/M3) in 15 locations excluding S.G.Halli. The measured PM2.5 values have exceeded the national limit (40.0µ g/M3) at 10 locations excluding stations namely University Visveshwaraiya College of Engineering, K.R.Circle, Victoria Hospital and National Institute of Mental Health and Neuro Sciences. The measured Ammonia and Lead concentrations at all the locations are well within the national limits. The measured CO concentration at 2 Continuous Ambient Air Quality Monitoring (CAAQM) stations are well within the national limit. The levels of PM10/PM 2.5 are attributed to the vehicular emissions/movement, re-suspension of road dust and construction activities (KSPCB, 2016a).

Air pollution arises from different sources such as industrial activities, open burning, fuel combustion, evaporation, etc. One of the major sources of air pollution is from transportation sources such as the exhaust gas from the tail pipe, mainly due to incomplete combustion of fuels. Key air pollutants, also referred as Common Air Pollutants (CAP) are emitted due to the vehicular traffic. Health effects of air pollution are already well known. For example, carbon monoxide (CO) slows the delivery of oxygen to the body's organs and tissues. Exposure to CO aggravates heart disease and can cause headaches and visual impairment. CAP include Total Particulate Matter (TPM), Particulate Matter less than or equal to 10 microns (PM10), Particulate Matter less than or equal to 2.5 microns (PM2.5), Sulphur Oxides (SOx), Nitrogen Oxides (NOx), Volatile Organic Compounds (VOCs), and Carbon Monoxide (CO). Emissions of CAP contribute to smog, poor air quality and acid rain (Kashyap, 2011).

1.6. Profile of Bengaluru Metro Rail

The Bengaluru Metro project, popularly known as "Namma Metro", was being implemented by the Bengaluru Metro Rail Corporation Limited (BMRCL) - a joint venture of the Government of India and the Government of Karnataka. The Bengaluru Metro project was undertaken in 2007.

The Delhi Metro Rail Corporation (DMRC) prepared the Detailed Project Report (DPR) for Phase I of the project. Metro started its operation in October 2011. The metro network consists of two colour-coded lines, with a total length of 42.3 kilometres serving 41 stations.

The Bengaluru Metro project has been developed in two phases. The Phase I network of the Namma Metro consists of two corridors – East-West and North-South.

- The East-West corridor is 18.1 km long, and starts from Baiyappanahalli in the East and ends at Mysore Road terminal in the West with 17 stations.

- The North-South corridor is 24.2 km long, from Nagasandra in the North to Puttenahalli in the South with 24 stations.

The East-West corridor is named the Purple Line and the North-South corridor is the Green Line. The two corridors intersect at Kempegowda station, which is a two level interchange station. The system has a mix of underground, at-grade, and elevated stations using standard-gauge tracks. Services operate daily between 06:00 and 22:00 running with a headway varying between 8-10 minutes. The travel time from end to end on the E-W corridor is 33 minutes and on the N-S corridor is 28 minutes. The trains are composed of three cars. The Metro has been designed for a capacity of 40,000 Peak Hour Peak Direction Traffic. The number of passengers expected to travel on the metro every day was estimated at 12 lakhs in 2013 and 19 lakhs in 2021. The metro has an average daily ridership of 140,000 passengers (BMRCL, 2017).

1.6.1. Ridership trend

Ever since the inception of the metro rail, there has been increase in ridership of passengers. Although the metro rail was operational since 2011, only parts of the East-West corridor were functional until 2015, when the complete stretch was fully operational. As per the data obtained from BMRCL, in July 2016 the ridership was 35, 22,412 which saw a fall in September, 2016 by 3, 86,839. Later there was gradual increase in ridership of passengers from October, 2016 to June 2017. The highest recorded ridership (47, 25,648) was seen in the month June, 2017.
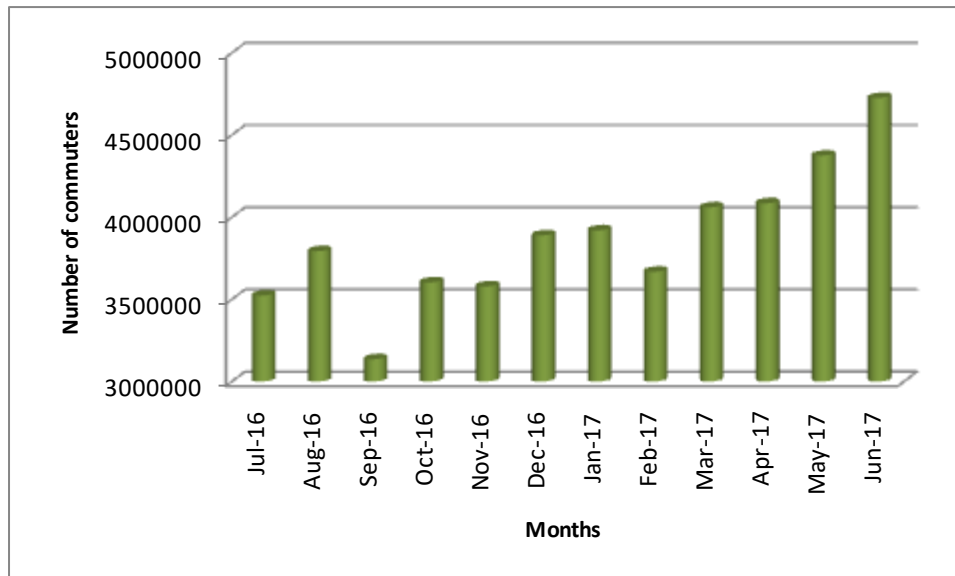
Figure 1.3 Ridership trend across the East-West corridor
Source: BMRCL, 2017

2. REVIEW OF LITERATURE

Metro rails are rail-based, mass rapid transit systems that operate on an exclusive right-of-way, which is separated from all modes of transport in an urban area. Most often, the rails are either underground or elevated above street level. These systems generally operate at an average speed of 20-35 km/h, and are characterized by their high capacity (50,000-75,000 passengers per hour, per direction) and high frequency of operation. The capital cost of construction is between 20-30 times that of the Bus Rapid Transit system, depending on whether the metro systems are underground or elevated (Mohan, 2008).

There has been a growing interest among policymakers about the relevance of rail-based systems in India, to address the mobility needs of the expanding population in the cities. While evaluating different mass transit system options for Indian cities, metro systems are often given preference due to the belief that road-based bus systems cannot cater to capacity requirements as much as metro systems. Also, metro rails are perceived to have higher levels of comfort, speed and efficiency, than bus systems, making them more attractive to both policymakers and potential users of the system.

Promoters of metro systems often claim that one of the benefits of the metro rail is reduced congestion, due to the users' shift from road-based motorized modes to metro systems. This mode shift is then claimed to result in reduced air and noise pollution and road accidents. It requires 1/5th energy per passenger km compared to road-based transport system. The other benefits include, reduced travel time for commuters, reliable and safe journey, reduction in atmospheric pollution, accidents, fuel consumption, minimal vehicle operating cost, cost effective and increase in the average speed of road vehicles (Mohan, 2008).

A study by KSPCB, Bengaluru mentioned that there was significant dip in air pollution after launch of Metro. The findings of the study stated that there was significant reduction in air pollution levels in the stretches around two metro stations in the aftermath of the launch of the East-West Corridor. This was as per the readings recorded and compared during April and May, 2016. The Respirable Suspended Particulate Matter (RSPM) values have decreased by 6% at Victoria Road, which is near M.G.Road Metro Station in May. RSPM has also gone down by 31% at City railway station during the same

period. The values showed that there was clear difference in pollution levels compared to the previous month (KSPCB, 2016b).

There have been some studies being carried out related to metro rail system in India and world over. The significant findings are discussed below:

Zhu and Liu (2004) studied the impact of the mass rapid transit (MRT) network on accessibility in Singapore using an integrated GIS tool. Four types of accessibility were assessed, including the accessibility to the central business district, to working population, and to industrial and commercial establishments. It also analysed the changes in accessibility brought about by the new MRT lines. The accessibility analyses showed that, a location closer to the central area of Singapore and the East-West MRT line is, the higher accessibility it attains, and the new North-East MRT line has greatly improved accessibility of the north-eastern areas, but has insignificant impact on accessibility of the northern, north-western and eastern part of the country.

Advani and Tiwari (2005) evaluated the public transport system in the context of Delhi metro rail. The study analysed Delhi metro in terms of capacity, travel time and accessibility to the system and evaluation indices reflecting commuter's perspective.

Tangphaisankun et al (2009) investigated the potential of paratransit as a feeder for mass transit system as well as the influence of commuter perceptions on paratransit service to the attitudes on mass transit connectivity and the behavioral intention in usage of mass transit and paratransit as a feeder. Satisfaction of commuters had a positive influence on mass transit connectivity attitudes and the future use of both paratransit and mass transit. The studies concluded that improvement policies regarding paratransit service should be carefully drawn with the purpose of enhancing the performance of mass transit.

A study on the estimation of CO_2 reduction from mass transit system projects was carried out by **Sharma et al (2010).** The proposed methodology was effectively used to estimate savings in CO_2 emissions, expected from mass transit system based on ridership data. Sensitivity analysis was carried out to know the impact of CO_2 emissions with different combination of input parameters (fuel type, engine technology, occupancy rate, emission factors, trip length and vehicle kilometres travelled). The findings provided only

a gross estimation of CO_2 gains from mass transit system based on ridership data and do not account for CO_2 emission produced at source for running of metro rail and their utilities.

Tangphaisankun et al (2010) investigated the present choice consideration, influences of personal behavior, and attitudes towards the services of paratransit and public transport on the commuter choice selection. Empirical results revealed that car users prefer to continue driving, while patronage of paratransit combination is decreasing. Car preference and dissatisfaction with comfort and convenience of public transport and paratransit also significantly influence the choice to drive. The pessimism about difficulties and the combination of paratransit and public transport modes potentially discourage usage of public transit and paratransit. The risks of using the combination between paratransit and public transport, especially on traffic accidents and crimes, were found to be a driving factor for selecting public-transport-only and private vehicle alternatives.

A study done by the Centre for Science and Environment on pollution levels in Delhi illustrates that in 2001, the annual average level of respiratory suspended particulate matter (RSPM, or PM10) in residential areas stood at 149 microgram per cubic metre. After registering a drop in 2005, the level rose to 209 microgram per cubic metre in 2008. The concentration is approximately three times higher than safe levels. Similarly, the eight-hourly maximum current level of carbon monoxide (CO) was touching 6,000 microgram per cubic metre - way above the safe level of 2,000 microgram per cubic metre - though the annual levels have registered a drop. Overall, these figures illustrated that the operation of the Delhi Metro has not led to a reduction in pollution levels in the city **(Randhawa, 2012).**

An exploratory study to evaluate accessibility to Bangkok metro systems using multi-dimensional criteria across user groups was carried out **Prasertsubpakij and Nitivattananon (2012).** The work highlights accessibility considerations to scrutinize how user groups access metro services based on Bangkok metro systems empirical case. Individual passengers at various stations were asked to rate the questionnaire that simultaneously considered accessibility aspects of spatial, feeder connectivity, temporal, comfort/safety, psychosocial and other dimensions. The findings gathered by user

disaggregated accessibility model showed that, the lower the accessibility perceptions, related uncomfortable and unsafe environment conditions, the greater the equitable access to services. The study suggested that, to balance the access priorities of groups on services, policy actions should emphasize acceptably safe access for individuals, cost efficient feeder services connecting the metro lines, socio-economic influences and time allocation.

Bag and Sen (2012) conducted an empirical study on Kolkata metro railway and customer satisfaction. The research consisted of the data collected through a structured questionnaire from a sample of 250 respondents. The survey analysis indicated that the male passengers who availed the metro services outnumbered that of female passengers. Majority of respondents travelling by metro rail belonged to the age group of 26-35 years. Most of the respondents opted for metro as a mode of transportation due to the promotional offer. The availability of extended Multi Ride scheme helped the commuters to avail minimum cost for their journey.

Jain et al (2014) analysed the public preferences using multi-criteria decision making for assessing the shift of urban commuters from private to public transport. The study used pair-wise weighing method (i.e. Analytical Hierarchy Process) to derive priorities for different criteria for shifting urban commuters to the public transport system based on their opinion. The primary survey was conducted from nearly 50 locations using a stratified random sampling technique from nine districts of Delhi to collect the data under four criteria: reliability, comfort, safety and cost. The results suggested safety as the most important criteria (36%) for encouraging the urban commuters to shift from private vehicles to public transport and then reliability (27%), cost (21%) and comfort (16%). The commuters were found to be happy with Delhi metro services compared to other modes of public transportation due to more frequency, adherence to schedule, less travel time, comfort and safety. Commuters were willing to pay more for better public transport service since the travel cost was not considered to be one of the important criteria. The results also showed that 96% commuters were willing to shift to public transport if above criteria or services are considered for providing an efficient public transport system.

Hamre et al (2014) evaluated the relationship between commuter benefits and mode choice for the travel to work using revealed preference data on 4,630 regular commuters,

including information about free car parking, public transportation benefits, showers or lockers, and bike parking at work in the Washington, DC region. Multinomial logistic regression results showed that free car parking at work was related to more driving. Commuters offered public transportation benefits, showers or lockers, or bike parking, but no free car parking, were more likely to either ride public transportation, walk, or cycle to work. The joint provision of benefits for public transportation, walking, and cycling is related to an increased likelihood to commute by all three of these modes and a decreased likelihood of driving. The inclusion of free car parking in benefit packages alongside benefits for public transportation, walking, and cycling, seems to offset the effect of these incentives. Benefits for public transportation, walking, and cycling, seemed to work best when car parking was not free.

Ding and Zang (2016) carried out a study on travel mode choice model using individual grouping based on cluster analysis. The study estimated travel behaviors by dividing individual travelers into several groups based on their personal characteristics. The individual grouping was achieved using the cluster analysis with the aid of the statistical analysis system (SAS) software. The trips to the central business district (CBD) in Nanjing City of China were taken as a case study. Two travel mode choices were investigated: the transit (bus and metro) and car. Travelers' personal information and travel information were collected through a reveal preference (RP) survey and a stated preference (SP) survey. The personal information included gender, occupation, income, and car ownership, while the travel information included the mode choice, walking time, waiting time, in vehicle time, fare, comfort, etc. There were 524 valid respondents in the RP/SP survey and the individuals were categorized into three groups using cluster analysis based on their personal information. It was found that people from the three groups had very different characteristics, indicating the cluster analysis worked well. Six travel scenarios were designed for each respondent to ask their travel mode choice. Then, the travel mode choices were estimated using a discrete choice model and compared with the mode choices in the RP/SP survey for each group. It was found that the accuracy rate of the mode choice estimation using individual grouping were remarkably higher than that without grouping, indicating that the individual grouping improved the travel behaviour estimation.

Kumar A (2015) carried out a study on systems approach to assess and improve the last-mile access to mass transits. This research attempts to understand, assess and improve the last-mile access of transit stations in order to improve the problems in Delhi. The study promotes the use of cycling for the last-mile access to transit stations and also developed framework to choose and prioritize a range of policies to promote commuter cycling under the given constraints. The study adopted a practice-oriented approach, first, by using case studies with actual field data and surveys; and second by adopting a systems perspective in the research to deal with the complexity. A comparative study on findings about commuter cycling policies and use of fare card data to estimate commuter cycling demand and to suggest policies to promote last-mile as well as end-to-end cycling in Singapore was carried out. Based on the demand the study suggested three main policy recommendations to promote commuter cycling in Singapore. These recommendations include creation of more cycling-oriented towns, developing cycling regions and advocating the concept of school cycling enclaves.

Chidambara (2012), studied on Last Mile Connectivity for enhancing accessibility of Rapid Transit Systems. The findings of the study were based on a small sample survey in the context of Delhi metro. The survey was conducted during morning and evening peak hours and included metro commuters on different routes, some on-board, some at metro stations and commuters in private transportation system. The survey primarily targeted regular commuters and as such only work/education related trips were included. The study indicated that 65% of current metro users expressed issues related to Last Mile Connectivity. Only a small percentage of transit commuters used private modes for last mile connectivity, the majority relied on para-transit modes or walking and cycling.

3. SOCIO-ECONOMIC AND ENVIRONMENTAL IMPACTS SURVEY TO ASSESS THE PERCEPTIONS OF THE COMMUTERS OF THE METRO RAIL

3.1.   Methodology

The methodology of the study is as shown in Figure 3.0(a)
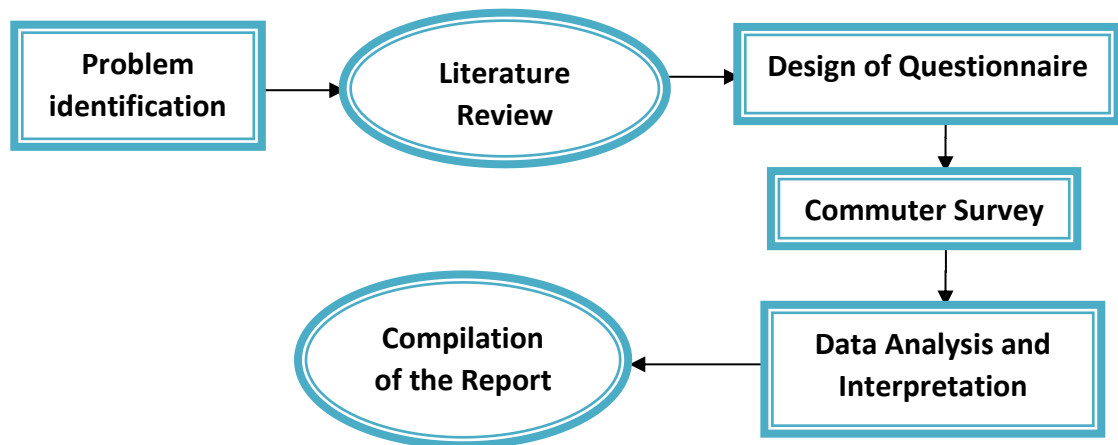
Figure 3.0(a) Methodology adopted in the study

3.2.   Study Area

The study area was the East-West corridor of the metro rail, also known as purple line which stretches across 18.10 km from Baiyappanahalli in the East and terminates at Mysore Road terminal in the West. It consists of 17 stations, the names of which are listed in Table 3.0 The entire stretch of East-West and North-South corridor of metro rail is represented in Figure 3.1 (Map Unity, 2017). The Baiyappanahalli metro station is located at Latitude: 12°59'27" N and Longitude: 77°39'09" E on the eastern side of the Purple line corridor. The Mysore road metro station is located at Latitude: 12°56'48" N and Longitude 77°31'48" E on the western side of the Purple line corridor.

Table 3.0.Metro stations along the East-West Corridor

Sl.No.	Name of the station	Type
1	Baiyappanahalli	Surface
2	Vivekananda Road	Elevated
3	Indiranagar	Elevated
4	Halasuru	Elevated
5	Trinity	Elevated
6	M.G. Road	Elevated
7	Cubbon Park	Underground
8	Vidhana Soudha	Underground
9	M.Visveshwaraya	Underground
10	Majestic	Underground
11	City Railway Station	Elevated
12	Magadi Road	Elevated
13	Hosahalli	Elevated
14	Vijayanagar	Elevated
15	Attiguppe	Elevated
16	Deepanjali Nagar	Elevated
17	Mysore Road	Elevated
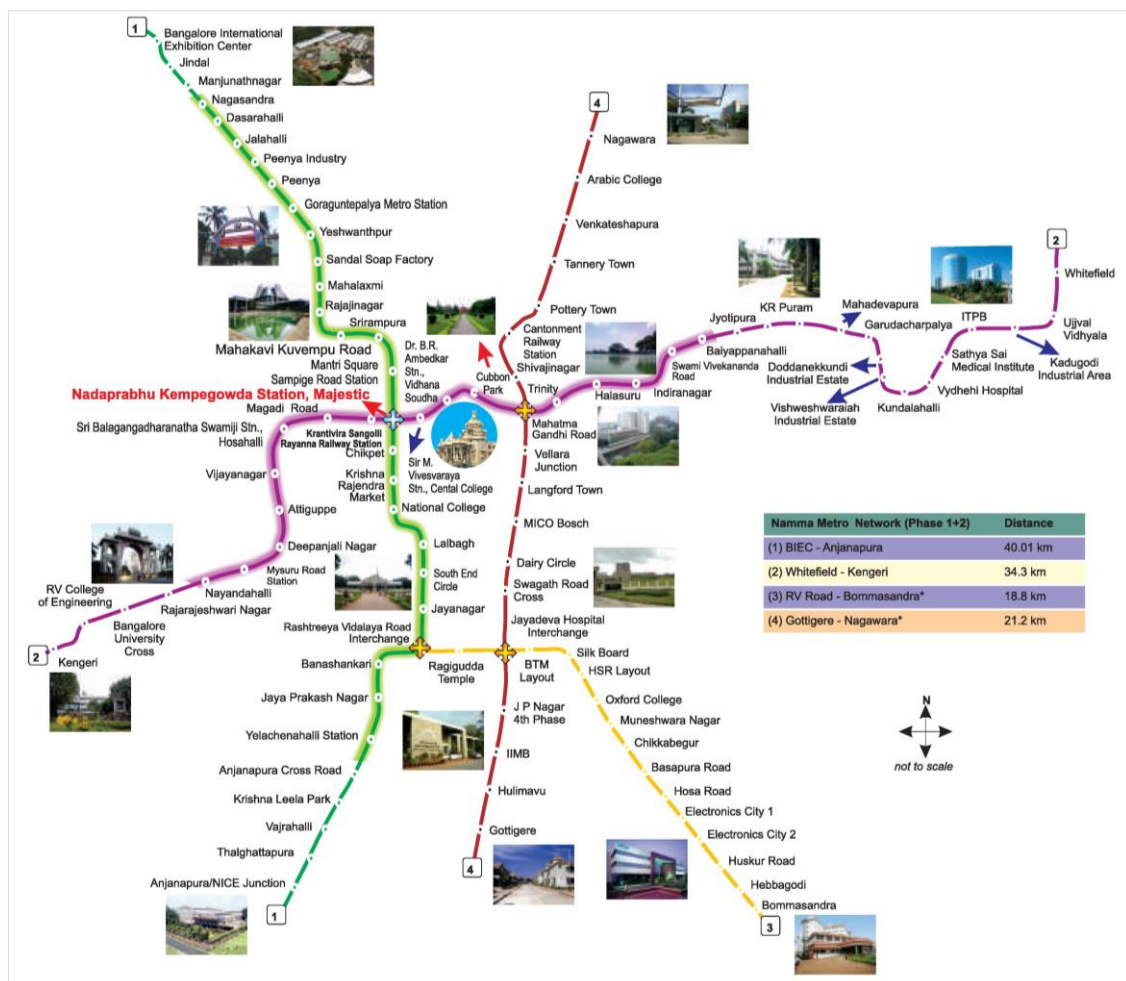
Figure 3.0(b) Metro route map

Source: Map Unity, 2017

1. **Design of Questionnaire**

   The questionnaire was designed into four parts consisting of 28 questions; the first part covered the socio-economic profile of the commuters such as age, gender, education, occupation and annual income, the second part covered the mode of transport and usage characteristics followed by the third component-environmental and economic perceptions of the commuters and the fourth part consisting of general suggestions/concerns of the commuters.

2. **Training of pollsters**

   The in-house pollsters (EMPRI research staff) were selected and trained to carry out the survey. Pilot survey was carried out to obtain the response from the commuters and certain instructions were given to the pollsters based on the learning from the pilot study.

3. **Commuter Survey**

   The commuters were surveyed along each of the 17 stations of the East-West corridor of the Metro rail. A stratified random sample was adopted for the study. The survey was scheduled for duration of 12 hours between 8.00 a.m–8.00.p.m. The commuters' perspectives were assessed through a structured questionnaire using specific factors related to transport sector.

4. **Data Analysis**

   The raw data generated after the survey were subjected to numerical coding and re- arrangement as per the requirement of the statistical software. The processed data were subjected to univariate, bivariate, multivariate analysis along with the Classification and Regression Tree analysis and represented accordingly.

5. **Statistical Interpretation**

   The chi square test is used to determine whether there is a significant association between the two variables. The p value or calculated probability is the estimated probability of rejecting the null hypothesis of a study question when that hypothesis is true.The p-value helps in determining the significance of the results (Montgomery, 1997). A p value is the indicator of the significance of the test, whose value below 0.01 indicates that the test parameter is highly significant (symbol**), value between 0.01-0.05 is significant (symbol*) and value between 0.05-0.1 (symbol+) indicates suggestive significance.

3.3. Results and Discussion

A survey on socio-economic and environmental impacts of the metro rail system on the commuters along the east-west corridor of the metro rail was undertaken. Stratified random samples of 1067 commuters were surveyed across the seventeen stations of the east-west corridor of the metro rail.

3.3.1. General characteristics of metro rail commuters

Among the total commuters surveyed, 35% (350) belonged to the age group 25-35 followed by 25% (255) of the age group 35-45. Therefore, 60% of the commuters using metro rail were under the age group of 25-45. As per the study, we can opine that, the large majority of the commuters belonged to the age group 25-45 who were mostly students and working professionals. About 1% of the commuters were above the age of 66 years. Considering the gender of the commuters, 57% were male and 43% female. Even though a slightly higher percentage was constituted by male commuters, this does not necessarily indicate that there were more number of male commuters travelling in metro rail as compared to the female commuters. These figures (Table 3.1) are indicative of the survey. The analysis depicts that, Bachelor's degree holder used less of metro services (6%) as compared to commuters who had qualification either below/above

Table 3.1 General characteristics of metro rail commuters

Individual characteristic	Category range	Respondents	
		Number	Percentage
Age	< 25	203	20
	25 to 35	350	35
	35 to 45	255	25
	45 to 55	117	12
	55 to 65	67	7
	>66	13	1
Total		1005	100
Gender	Male	585	57
	Female	450	43
Total		1035	100
Education	Below Bachelor's Degree	225	29
	Above Bachelor's Degree	514	65
	Bachelor's Degree	50	6
Total		789	100

Bachelor's degree. About 65% of people commuting in metro rail had qualification above Bachelor's degree indicating that most of them were working professionals. Table 3.1 depicts the general characteristics of metro rail commuters.

3.3.2. Mode of transport and usage characteristics

The metro rail commuters are highly dependent on a particular mode of transport to reach the metro station. As per the survey analysis, most commonly used mode of transport by commuters to transit from home to metro station were bus (22%) and two wheeler (19%). A large majority of the commuters opted to walk (41%) from home to the metro station. This shows that the metro stations were in proximity to the residential areas, due to which greater number of commuters felt it was convenient to walk and travel using metro rather than opt for some other mode of transport. The remaining commuters transited by car (5%), taxi (3%), cycle (2%) and auto rickshaw (8%). A slight variation was seen in the time taken to transit from metro station to home. This could have been due to the variation in traffic density during the early hours of morning and late evening. Greater number of commuters preferred to walk (41%) to the home from the metro station. The rest of the commuters transited by bus (22%), two-wheeler (19%) and bicycle (2%). As only few commuters used bicycle to reach the metro station, we need to promote usage of bicycles by providing the cycle lanes along the stretches of the metro rail (Table 3.2).

The time taken by the commuters to reach the destination is an important factor in determining the usage of mass rapid system. Fifty percent of the commuters reach from home to metro station within ten minutes and 42% of the commuters reach within 10-30 minutes. The remaining 8% of the commuters took more than 30 minutes to reach their destination. The time taken to reach the metro station by walk was much lesser when compared to other modes of transport (Table 3.2).

The mode of transport and frequency characteristics of metro rail commuters is an important component to assess the behavioural perspective of the commuters. Among the commuters, 70% use metro on a daily basis as against 17% who use metro on a weekly basis (Table 3.2) The remaining commuters travelled fortnightly (5%), monthly (2%) and occasionally (6%). Commuters in the Hosahalli station were seen to have the highest daily usage rate of metro (88%), followed by Magadi Road (82%), Attiguppe

(81%), Mysore Road and Majestic (80%) when compared to other stations of East-West corridor. Stations namely M.Vishveshwaraya (28%) and M.G.Road (26%) were seen to have maximum commuters transiting on a weekly basis. The Indira Nagar station had 8% of commuters travelling by metro on a monthly basis.

Table 3.2 Mode of transport and frequency characteristics of commuters

Individual characteristics	Category range	Respondents	
		Number	Percentage
Mode of transport to station	Bus	234	22
	Car	49	5
	Taxi	29	3
	Cycle	20	2
	Auto rickshaw	84	8
	Walk	430	41
	Two-Wheeler	202	19
Total		1048	100
Travel time to station (Minutes)	0-10	500	50
	10-30	421	42
	30-60	71	7
	60-90	12	1
	>90	5	0
Total		1009	100
Mode of transport to home	Bus	234	22
	Car	46	5
	Taxi	30	3
	Cycle	21	2
	Auto rickshaw	84	8
	Walk	430	41
	Two-Wheeler	203	19
Total		1048	100
Travel time to home (Minutes)	0-10	495	50
	10-30	419	41
	30-60	76	8
	60-90	15	1
	>90	4	0
Total		1009	100
Frequency	Daily	735	70
	Weekly	175	17
	Fortnightly	55	5
	Monthly	25	2
	Occasionally	67	6
Total		1057	100

Reduction in travel time (Minutes)	Yes	1048	99
	No	9	1
Total		1057	100
Reduction in travel cost	Yes	717	68
	No	334	32
Total		1051	100
Cost per trip (Rupees)	21-50	208	26
	51-70	106	14
	No change	295	38
	71-100	15	2
Total		783	100

Table 3.3 shows the relationship between the modes of transport used to reach the metro station and time taken to travel. Chi square test was applied to find the association between the above mentioned parameters. Most of the commuters who travelled by bus, car, taxi, auto rickshaw and two-wheeler took 10-30 minutes time to reach the station. Seventy one percent of the commuters reached the metro station within 10 minutes by walk whereas 25% of the commuters took 10 minutes by bus to reach the station. There is significant difference between the modes of transport they used and the time taken to reach the station. This is because, as the modes of transport opted by the commuter's changes, the time taken to reach the station also changes.

Table 3.3 Association between modes of transport used to reach station and travel time

Mode of Transport	Time travel to station (Minutes)					Chi square	p value
	0-10	10-30	30-60	60-90	>90		
	Response (Percentage)						
Bus	25	49	19	5	2	242.7	0.00
Car	32	51	15	0	2		
Taxi	35	52	13	0	0		
Cycle	53	41	6	0	0		
Auto rickshaw	29	64	6	0	1		
Walk	71	29	0	0	0		
Two-wheeler	45	49	6	0	0		
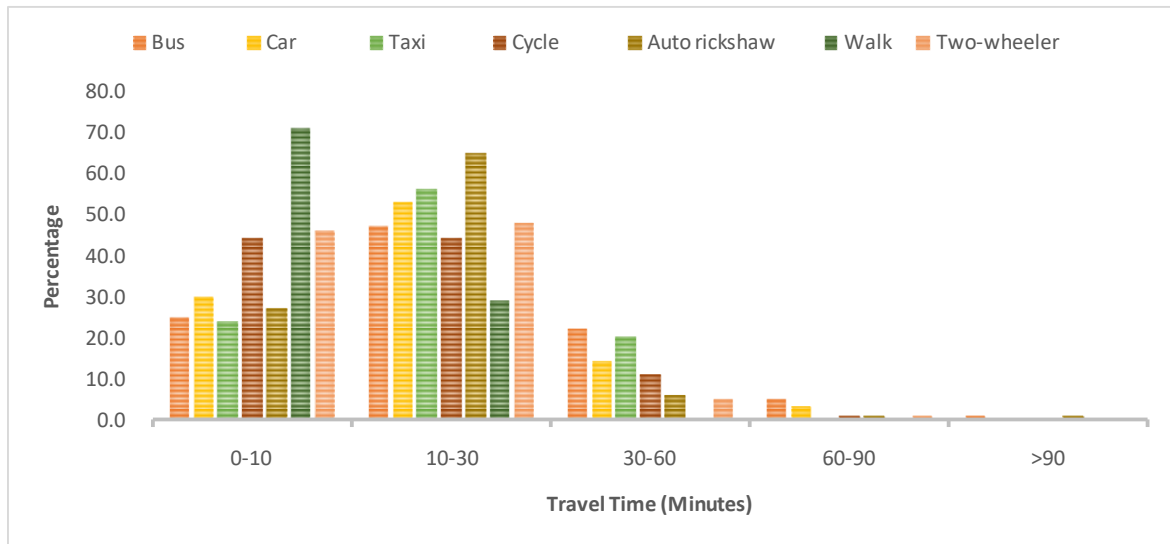
Figure 3.1 Mode of transport to station v/s travel time

Table 3.4 shows the relationship between the modes of transport used to reach home and time taken to travel. Chi square test was applied to find the association between the above mentioned parameters. Most of the commuters transiting by bus, car, taxi, auto rickshaw and two-wheeler took 10-30 minutes time to reach home from metro station. Seventy one percent of the commuters reached the metro station within 10 minutes by walk whereas 27% of the commuters took 10 minutes by auto rickshaw to reach home from metro station. Twenty nine percent of the commuters took 10-30 minutes by walk to reach home from metro station. During the 30-60 minutes travel time, there were no commuters walking home from metro station. This is indicative of the fact that, nearer the metro station to the proximity of residential area, more commuters prefer to reach the station by walk. Further away from the metro station, the commuters prefer to transit by bus, taxi, auto rickshaw or cycle.

Table 3.4 Association between modes of transport used to reach home and travel time

	Travel time to home (min)					Chi square	p value
Mode of Transport	**0-10**	**10-30**	**30-60**	**60-90**	**>90**	264.2	0.00
Response (Percentage)							
Bus	25	47	22	5	1		
Car	30	53	14	3	0		
Taxi	24	56	20	0	0		
Cycle	44	44	11	1	0		
Auto rickshaw	27	65	6	1	1		
Walk	71	29	0	0	0		
Two-wheeler	46	48	5	1	0		
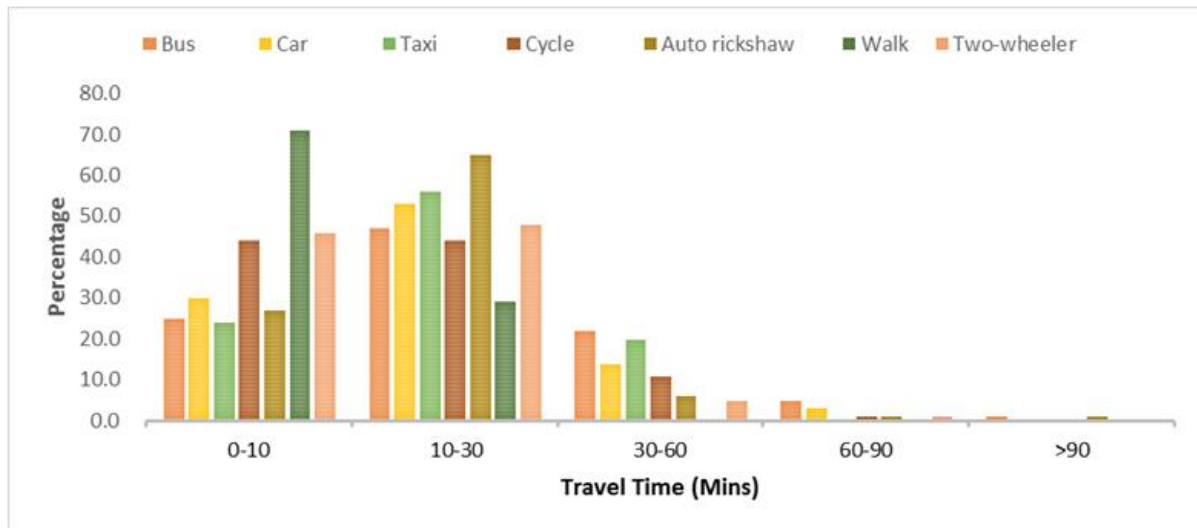
Figure 3.2 Mode of transport to home v/s travel time

Ninety nine percent of the commuters opined that there was reduction in transit time by usage of metro rail when compared to other modes of transport as shown in Table 3.2. As per the survey analysis, 91.8% of the commuters reached their destination within 30 minutes. Sixty eight percent of the commuters opined that there was reduction in travel fare after shifting from a previous mode of transport to metro rail whereas 32% felt there was no reduction in travel cost inspite of commuting in metro rail. Thirty eight percent of the commuters felt that there was no change in the travel fare per trip inspite of shifting from a previous mode of transport to the metro rail. This indicates that, overall the travel fare of metro rail is not very economical as compared to other modes of transport. Twenty seven percent of the commuters spent between Rs.21-50 per trip for commuting in metro rail whereas 20% of the commuters spent between Rs.10-20. Further, 14% of the commuters spent between Rs.51-70 and only 2% of the commuters spent about Rs.71-100 to commute by metro rail. Appropriate reduction in travel fare could promote more usage of metro rail services by commuters.

Reduction in travel cost per trip

As per the analysis, 43% of the commuters stated that there was Rs.21-50 reduction in travel cost/trip. Thirty three percent of the commuters saw Rs.10-20 reduction in travel cost/trip. Twenty one percent of the commuters saw Rs.51-70 reduction in travel cost/trip. This data clearly indicates that there is large amount of potential savings in terms of travelling cost. Shifting from a previous mode of transport to metro rail has helped the commuters to save both money and time (Figure 3.3).
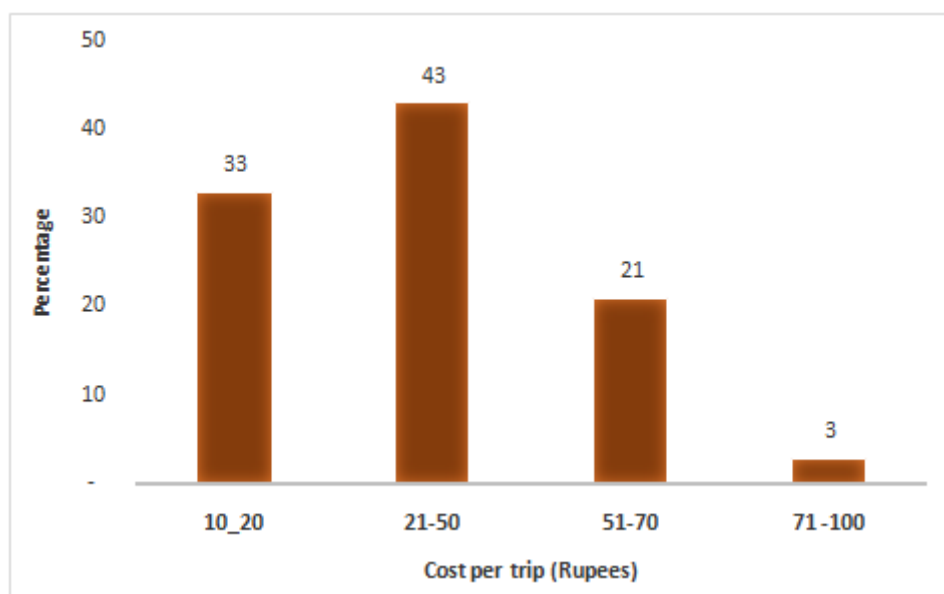
Figure 3.3 Reduction in travel cost per trip

Table 3.5 shows the association between the frequency of usage and age of commuters. The association was estimated using chi square test. Thirty seven percent of the commuters of the age group 25-35 travelled daily using metro. Under the age of 25, 27% of the commuters travelled occasionally using metro. In the middle age group (35-45), 43% of the commuters travelled once a month. Commuters using metro once in a fortnight are more in the age group of 25-35 and 45-55 (28%). From the above analysis, it was known that the most frequent users of metro are in the age group of 25-45 and commuters of the age 55 were not using metro frequently.

Table 3.5. Association between Frequency of usage and Age of commuters

	Age (Years)						Chi square	P value
Frequency of Usage	**<25**	**25-35**	**35-45**	**45-55**	**55-65**	**>65**		
Response (%)								
Daily	21	37	25	11	5	1	232.76	0.00
Weekly	20	33	27	9	10	1		
Fortnightly	8	28	23	28	7	6		
Monthly	24	10	43	23	0	0		
Occasionally	27	30	19	11	13	0		
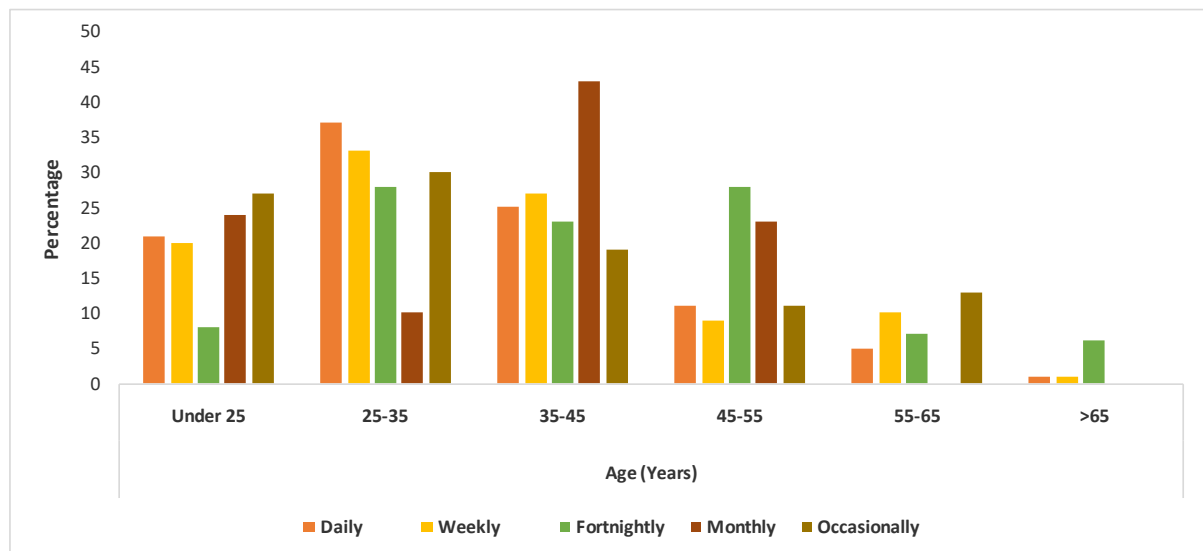
Figure 3.4 Association between Frequency of usage and Age of commuters

Gender as one of the usage characteristics of commuters was taken into consideration to estimate the number of male and female commuters of metro rail. The daily commuters were approximately distributed between the male (53%) and female (47%). There was more number of male commuters (70%) who travelled once a week. There was equal number of male and female commuters travelling once a month (50%) (Table 3.6).

Table 3.6. Association between Frequency of usage and Gender of commuters

Frequency of Usage	Gender		Chi square	p value
	Male	**Female**		
	Response (%)			
Daily	53	47		
Weekly	70	30		
Fortnightly	57	43	18.09	0.64
Monthly	50	50		
Occasionally	64	36		
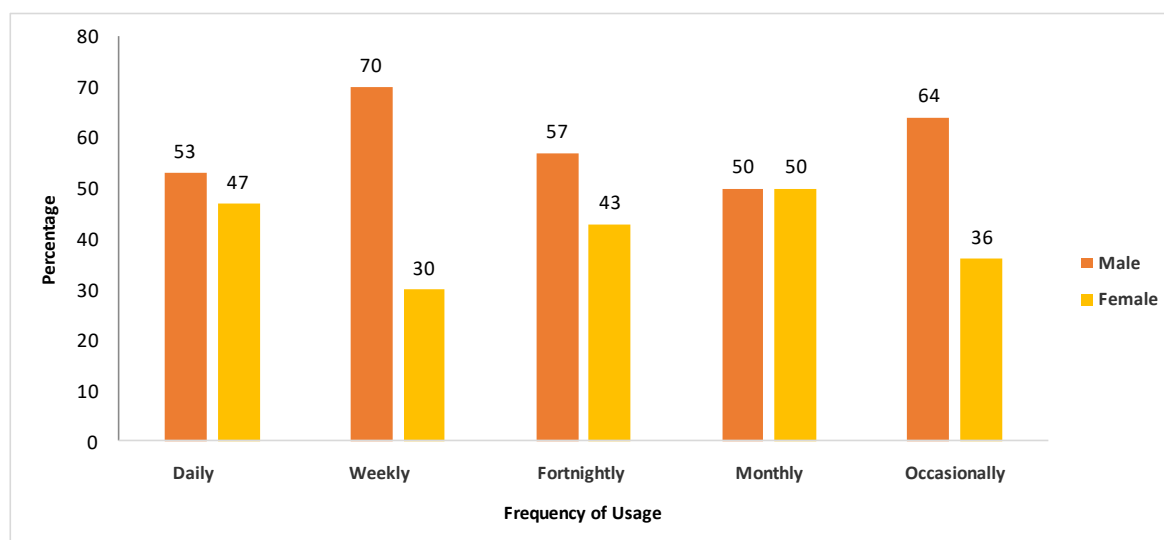
Figure 3.5 Association between Frequency of usage and Gender of commuters

Eighty percent of the commuters with above Bachelor's degree used metro occasionally, whereas 65% used daily and 66% used weekly. There were only 18% of the commuters below Bachelor's degree who used metro occasionally. Most of the commuters using metro daily, weekly, fortnightly and occasionally were above Bachelor's degree and the commuters with Bachelor's degree were not using metro more frequently (Table 3.7).

Table 3.7 Association between Frequency of usage and Education of commuters

Frequency of User	Education Response (%)			Chi square	
	Below Bachelor's Degree	Bachelor's Degree	Above Bachelor's Degree	X squared	p value
Daily	27	8	65		
Weekly	29	5	66		
Fortnightly	39	3	58	17.343	0.03
Monthly	58	0	42		
Occasionally	18	2	80		
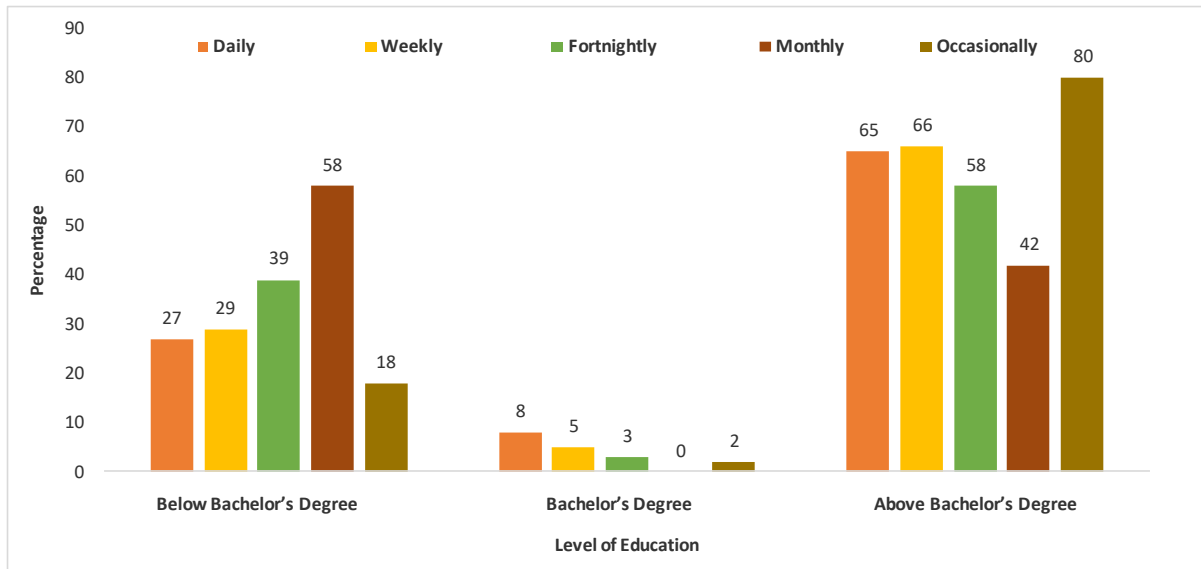
Figure 3.6 Association between Frequency of usage and Education of commuters

Association between Frequency of usage and Mode of transport to station is shown in Table 3.8. Twenty five percent of daily commuters took private vehicle to reach the station whereas 47% of the commuters travelling once in a fortnight took public transport to reach the station. About 42% of the commuters travelling once in a fortnight walked to the metro station.

Table 3.8 Association between Frequency of usage and Mode of transport to reach station

| | Mode of transport | | | | |
| | Response (%) | | | | |
Frequency of Usage	Private	Public	Walk	Chi square	p value
Daily	25	34	41		
Weekly	18	43	39		
Once a fortnight	11	47	42	13.804	0.006
Once a month	16	52	32		
Occasionally	21	39	40		

Association between the two factors, frequency of usage and mode of transport to home was significant, as the associated chi square value was significant. More number of commuters who walk back home from station are the ones who travel daily or occasionally. Lesser number of commuters use private mode of transport to reach home. From the analysis, it is evident that most of the commuters used either public transport or preferred to walk to reach their home.
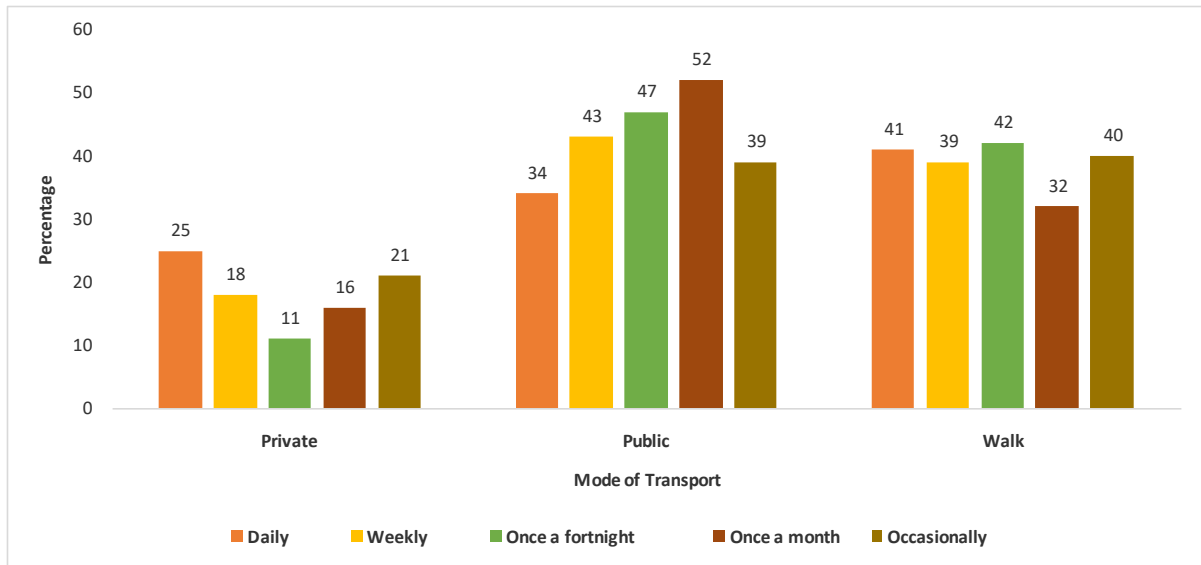
Figure 3.7 Association between Frequency of usage and Mode of transport to home

Relationship between Mode of Transport to the station and Parking facility

According to the analysis, 64% of the daily commuters who are using private vehicles to reach the station expressed that they have been provided parking facility at metro stations (Figure 3.8). The commuters who were travelling once a month and occasionally also stated that they did not have any parking facility at the metro stations. Among the commuters who reached home by walk from the metro station, 69% of them opined that they did not have any parking facilities at the metro stations. Fifty six percent of the commuters who were using public transportation to reach home from metro station opined that there was no parking facility provided at metro station (Figure 3.9). If BMRCL improves parking facility at metro stations, there would be an increase in ridership of metro rail. Figure 3.10 shows the association between frequency of usage with parking facility. Fifty eight percent of the daily commuters and 71% of the monthly commuters opined that the parking facility was provided at the metro stations.
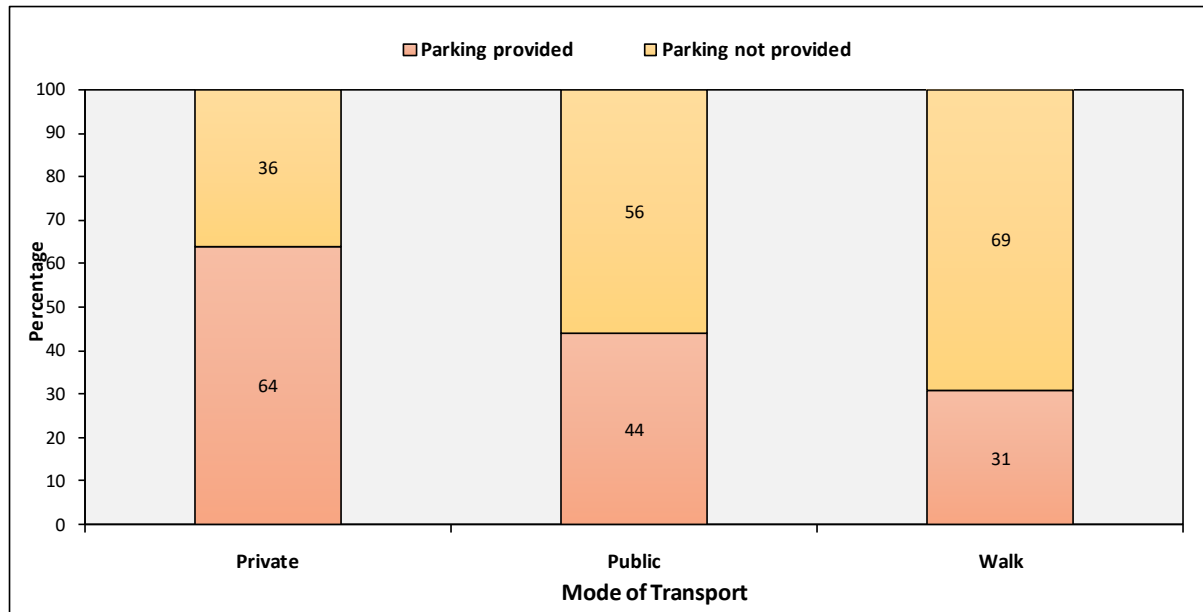
Figure 3.8 Association between Mode of Transport to station and Parking facility
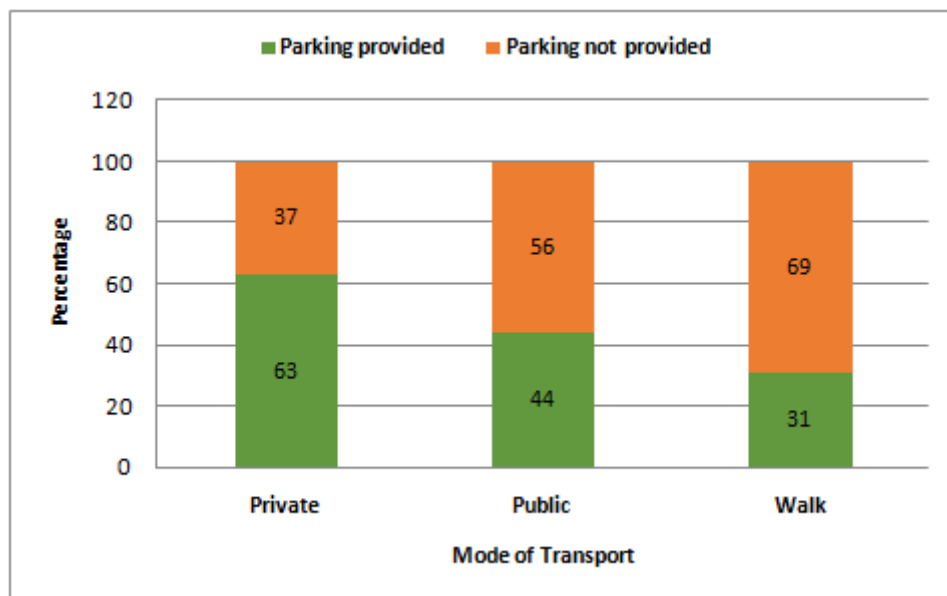
Figure 3.9 Association between Mode of Transport to home and Parking facility
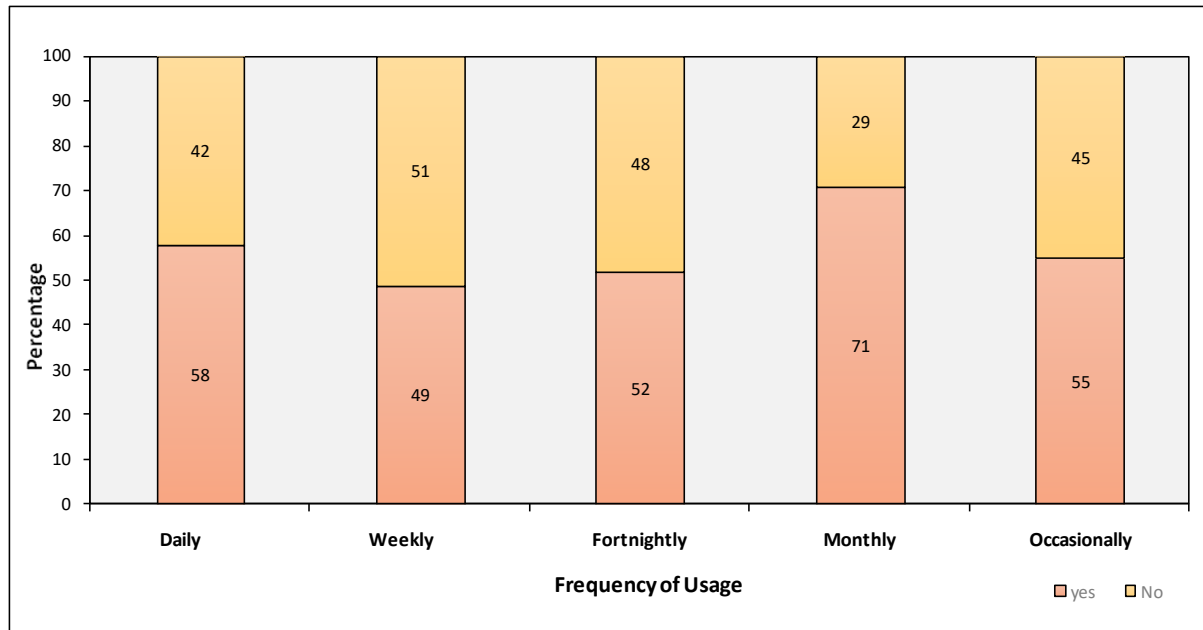
Figure 3.10 Association between Frequency of usage with Parking facility

Relationship between Frequency of Usage with reduction in Vehicle Density

Commuters were asked to express their views on reduction in vehicle density in Bengaluru after introduction of metro rail. Most of the commuters opined that there was partial reduction in vehicle density after introduction of metro. Sixty three percent and 60% of monthly and occasional commuters opined that there was only partial reduction in vehicle density in Bengaluru city. Thirty seven percent of the weekly commuters stated that there was moderate reduction in vehicle density whereas 3% of occasional commuters said that there was complete reduction in vehicle density (Figure 3.11)
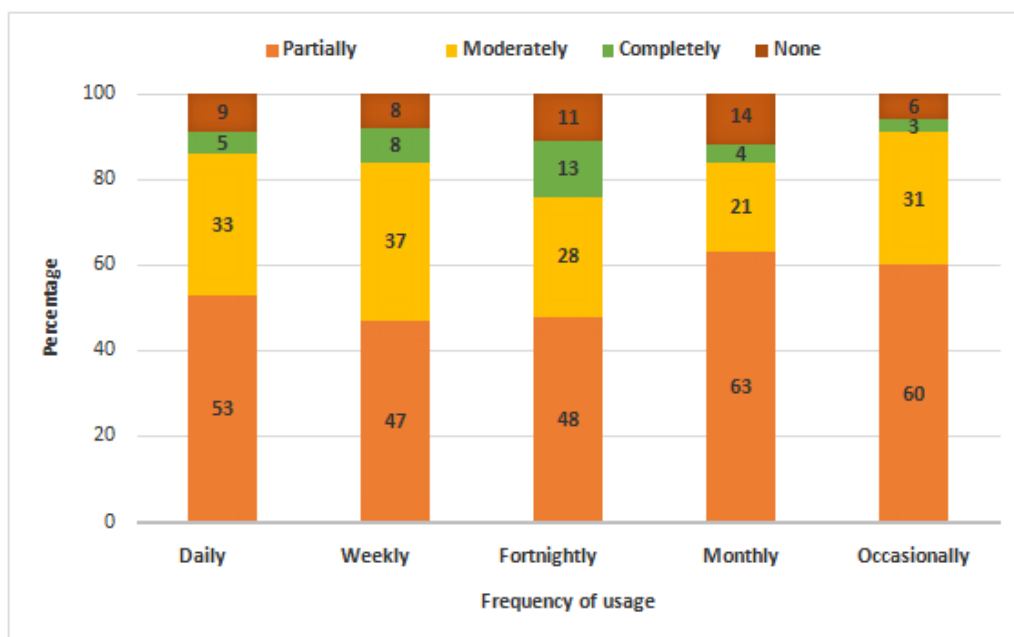
Figure 3.11 Association between Frequency of Usage with Vehicle Density

Commuters were sought information on mode of transport they prioritized and the most convenient mode of transport they preferred to transit (Table 3.9 and Table 3.10). Among the total commuters surveyed, 88% prioritized metro rail for day-to-day travel, whereas 4% and 2% of the commuters prioritized bus and private vehicle respectively. Ninety four percent of the commuters felt that metro rail was most convenient mode of public transport to transit, whereas 5% of the commuters opined that bus was the convenient mode of public transport.

Table 3.9 Mode of transport prioritized by commuters

Mode of transport	Respondents	
	Number	Percentage
Bus	40	04
Auto rickshaw	54	05
Cab	13	01
Metro	935	88
Private vehicle	25	02
Total	1067	100
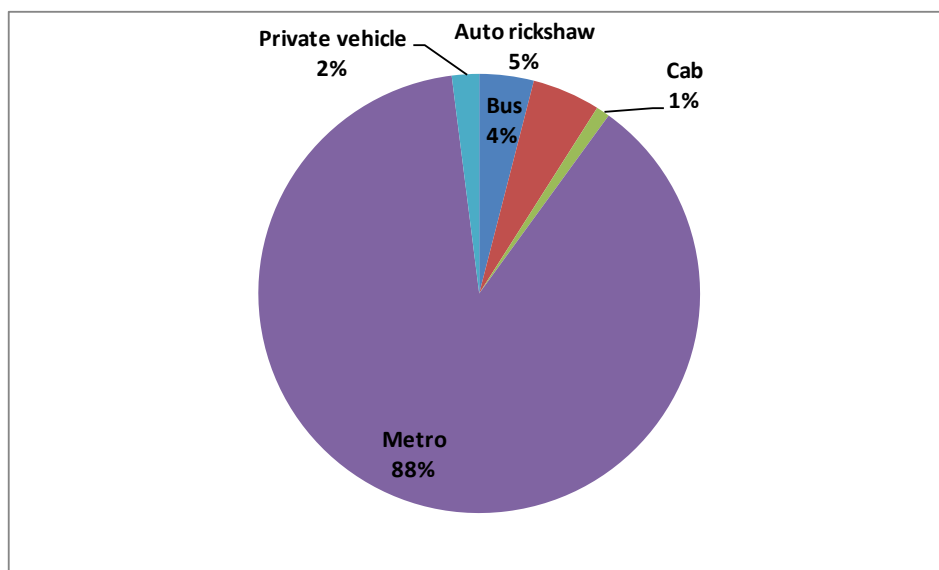
Figure 3.12 Mode of transport prioritized by commuters

Table 3.10 Mode of public transport convenient to commuters

Mode of transport	Respondent	
	Number	Percentage
Bus	51	5
Metro	1002	94
Train	12	1
Total	1065	100
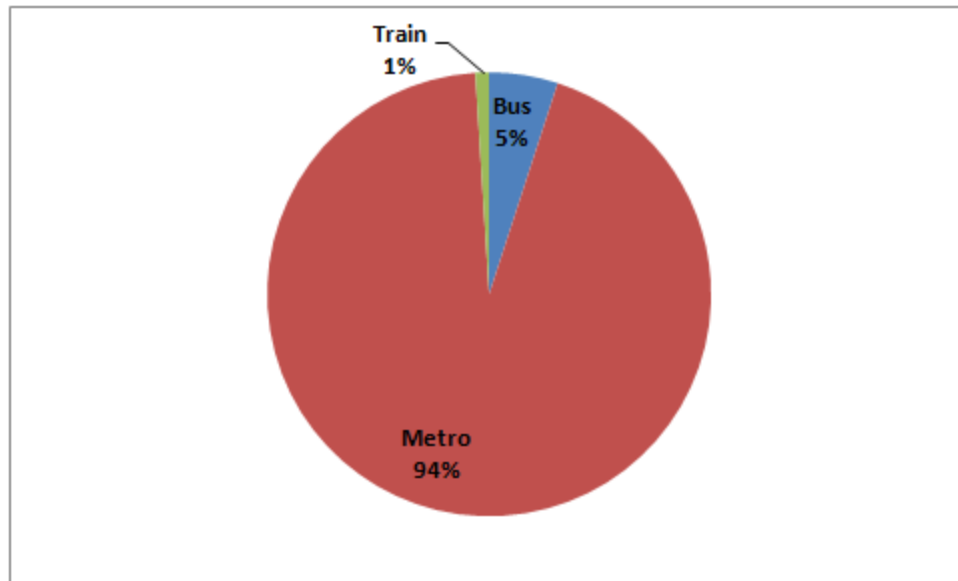
Figure 3.13 Mode of public transport convenient to commuters

Ninety nine percent of the commuters opined that the metro rail was safe to travel, as against the other modes of transport such as bus, train and private vehicle. Ninety four percent of the commuters felt that metro rail was safe in terms of accidents not happening when compared to other modes of transport. Almost all commuters opined that metro rail was the safest mode of transport as compared to other modes of transport. It was observed that there was no significant relationship between safety in metro and frequency of metro usage (Table 3.11).

Table 3.11 Safety aspects of metro rail

Characteristic	Respondent	
	Number	**Percentage**
Safe	1042	99
Safe through the following aspects		
Accident	996	94
Vehicle theft	450	42
Fire	344	32

3.3.3. Areas of the metro that needs improvement

Commuters were sought opinion on the areas of improvement needed in the metro rail system. As indicated in this study, the introduction of the metro rail has clearly helped improve the transport scenario of the city. **In terms of the areas of improvement, 62% of the commuters opined that connectivity was a major issue,**

followed by frequency (33%), parking (23%), travel cost (18%) and ticketing (4%) (Figure 3.14). The frequency was another issue to be considered, as there was variation in frequency of metro rails plying in the early morning, noon and late evening. At times, commuters spend more time waiting at the stations which would result in unnecessary delay in reaching their destination. In order to avoid this inconvenience, there needs to be an increase in frequency of the metro rail during the peak hours of travel. Provision of parking facility at the stations would attract more number of commuters to travel by metro. Presently, due to non-availability of parking facilities, many commuters refrain from using metro services and instead opt for other modes of transportation. Considering the travel cost of other modes of public transportation, metro travel fare was found to be slightly expensive. This could also de-motivate the commuters from using metro. Therefore, comparing the fare of other modes of public transportation, the metro fare could be made more affordable and economical, which would thereby increase the usage of the services by larger number of commuters. Increase in ticketing counters at the stations could also ease the delay caused to the commuters while procuring the ticket.

Table 3.12 Commuters response on areas of improvement

Areas of improvement	Respondent	
	Number	Percentage
Connectivity	659	62
Frequency	351	33
Vehicle parking	242	23
Travel cost	195	18
Ticketing	43	4
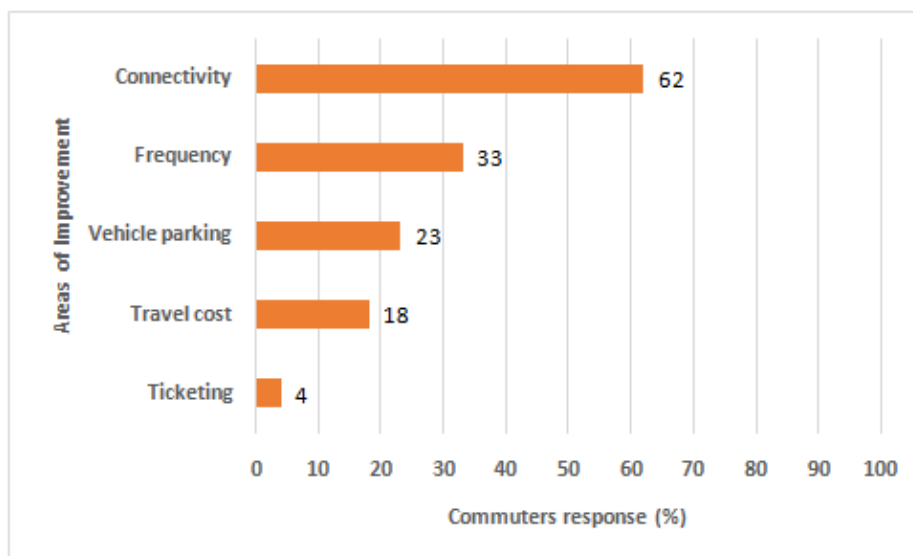
Figure 3.14 Commuters response on areas of improvement

Table 3.13 Commuters response on parking facility at the metro station

Characteristic	Response	Respondent	
		Number	Percentage
Parking facility	Yes	400	43
	No	522	57

Forty three percent of the commuters stated that there was parking facility at the metro stations as against 57% who said that there was no parking facility (Table 3.13).

Station wise opinion of the commuters about the availability of vehicle parking facility at the different metro stations was compiled. This would give a clear insight of the status of parking facility at the different metro stations of the East-West corridor. There was good parking facility at Baiyappanahalli station (74%) followed by M.G.Road (69%) and Mysore Road station (65%). Least parking facility was provided at Hosahalli station (13%) (Figure 3.15).
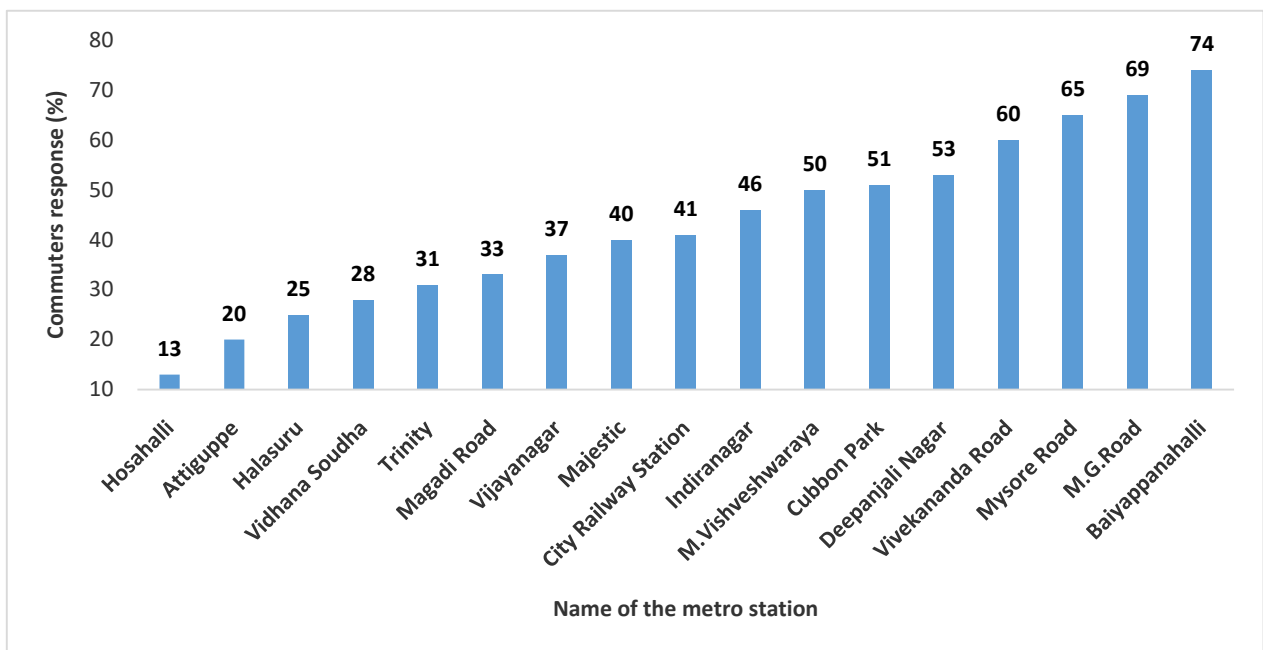
Figure 3.15 Station wise opinion of commuters about provision of parking facility

Station wise opinion of the commuters about the connectivity aspect was compiled, to a give a clear insight as to which of the metro stations need improvement in connectivity. As per the analysis, 84% of the commuters at Mysore Road and Baiyappanahalli metro station said that connectivity to the rest of the city needs to be drastically improved. M.G. Road and M.Vishveshwaraya metro station seem to have least number of people complaining about connectivity issues (Figure 3.16).
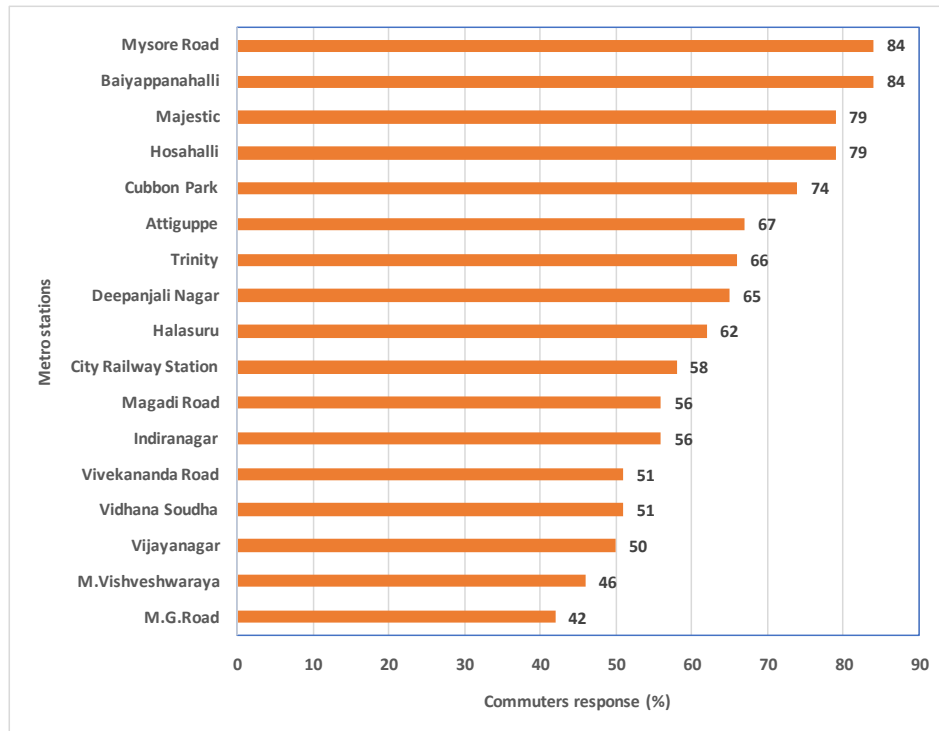
Figure 3.16 Station wise opinion of commuters about connectivity of metro rail

Frequency of metro rail was another area of improvement which needs immediate action. Fifty five percent of the commuters at Hosahalli metro station and 49% of commuters at Mysore Road and Baiyappanahalli stations felt that there should be frequent rails plying within a short gap. Cubbon Park (14%) and Vijayanagar (18%) metro stations had least issues about frequency as opined by the commuters (Figure 3.17).
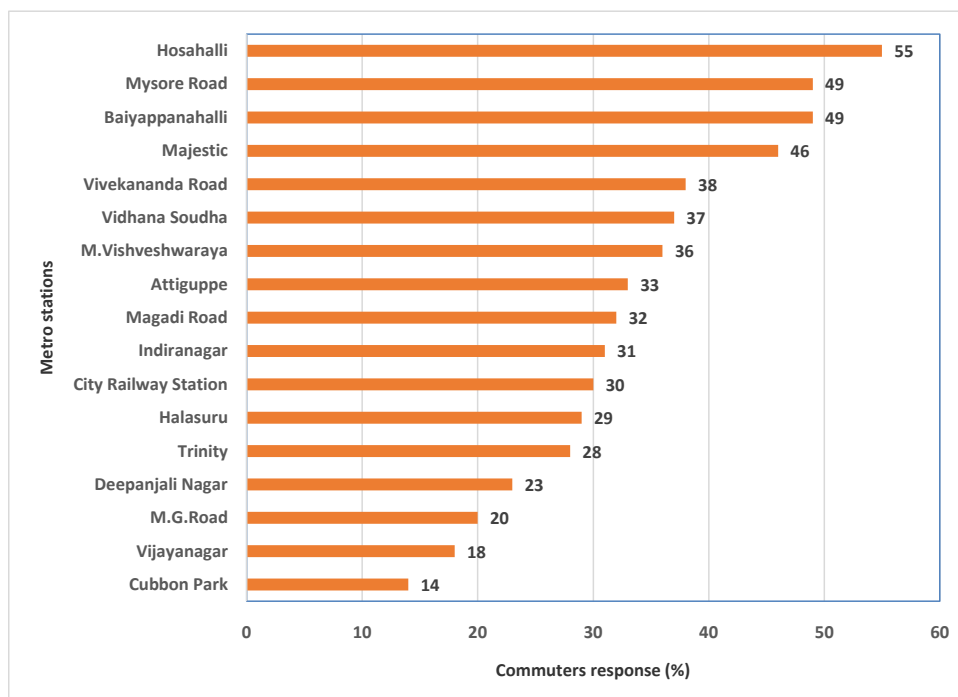
Figure 3.17 Station wise opinion of commuters about frequency of metro rail

3.3.4. Commuters perspective on environmental impacts of metro rail

The commuters were asked to express their opinion about the impacts of introduction of mass rapid system on the environment. All major factors having an effect on the environment such as reduction in vehicle density, pollution levels and sound levels, improvement in quality of air and traffic flow, health effects while commuting in metro were assessed.

As per the analysis, 53% of the commuters opined that there was partial reduction in vehicle density on road whereas 33% felt that there was moderate reduction in vehicle density. About 8% opined that there was no reduction in vehicle density in spite of many commuters plying in metro rail. The perceptions of the commuters varied tremendously as there are no quantifiable and verifiable figures available to claim that there has been significant reduction in the vehicle density.

Fifty five percent of the commuters felt that there was partial reduction in pollution levels and 28% opined that there was moderate reduction in pollution levels. Lesser number of commuters (9%) opined that there was complete reduction in pollution levels. To ensure reduction in pollution levels, particularly the Green house Gases (GHGs), we need to encourage more number of commuters to shift from other modes of transport to metro rail. To achieve this objective, we need to establish connectivity, increase frequency and parking facility at the stations which would see an increase in ridership of metro services over a period of time. This would directly affect the vehicle population on road there by bringing in reduction in GHG emission in the environment.

As opined by the commuters, there was partial improvement (48%) in air quality followed by moderate improvement (26%). Eighteen percent of the commuters felt that was complete improvement in air quality (Table 3.14).

Sixty five percent of the commuters mentioned that there was partial improvement in flow of traffic and 23% of the commuters felt that was moderate improvement in traffic flow (Figure 3.20).

Table 3.14 Commuters response on impacts of metro rail on environment

Characteristic	Response	Respondent	
		Frequency	Percentage
Reduction in vehicle density	Partially	546	53
	Moderately	340	33
	Completely	62	6
	None	86	8
		1034	100
Reduction in pollution level	Partially	570	55
	Moderately	290	28
	Completely	90	9
	None	85	8
		1035	100
Improvement in air quality	Partially	492	48
	Moderately	266	26
	Completely	184	18
	None	81	8
		1023	100
Health effects while commuting in metro	Headache	20	2
	Nausea	4	0
	Dizziness	7	1
	Sleepiness	6	1
	None	1016	96
		1053	100
Reduction in sound level	Yes	840	83
	No	175	17
		1015	100
Improvement in traffic flow	Partially	665	65
	Moderately	232	23
	Completely	44	4
		941	92
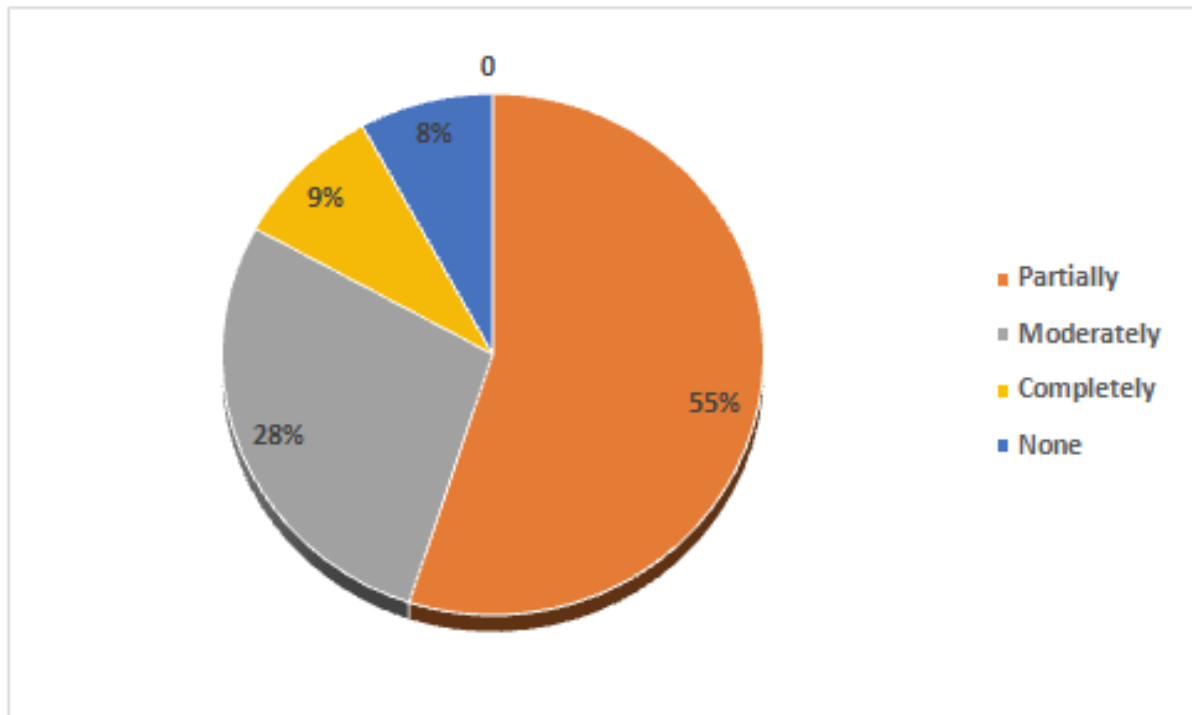
Figure 3.18 Commuters response on reduction in pollution levels
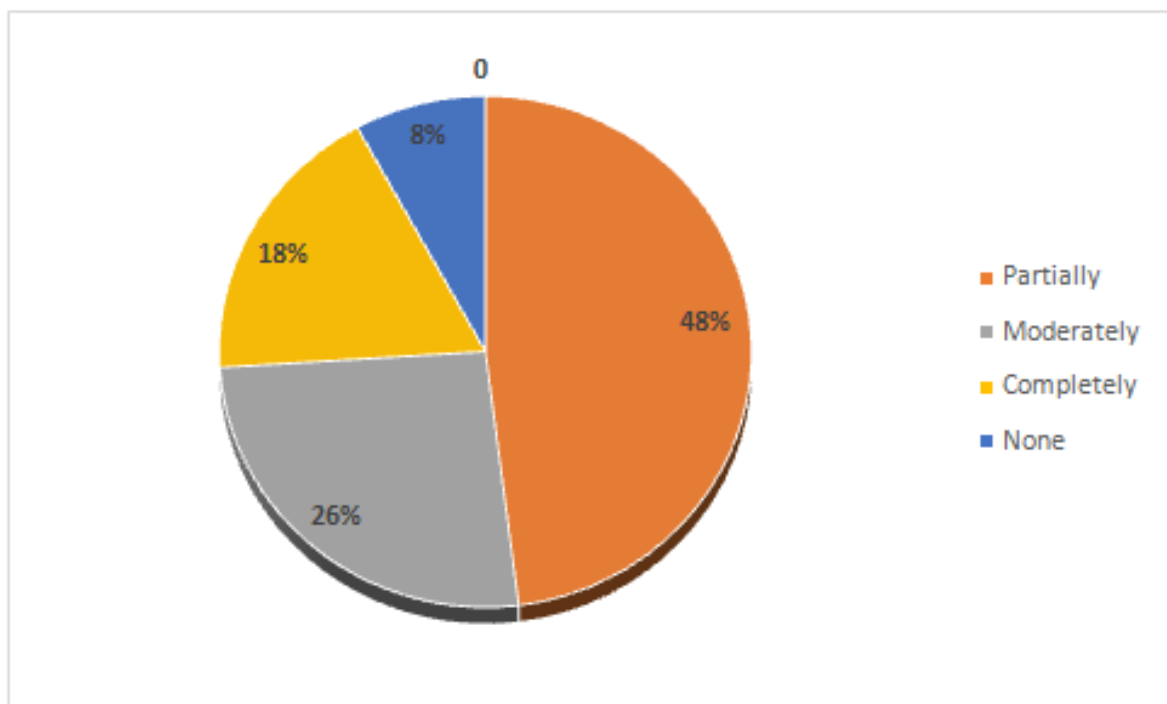
Figure 3.19 Commuters response on reduction in air pollution
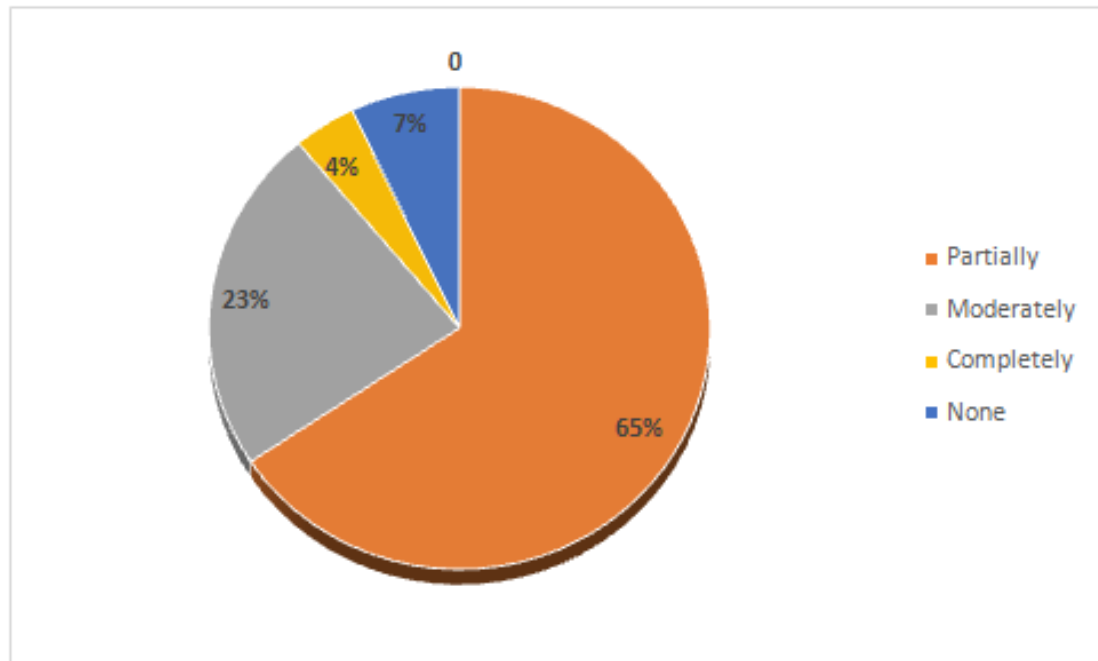
Figure 3.20 Commuters response on improvements in flow of traffic

Commuters revealed about the likely impact on health caused while commuting in metro rail. Ninety six percent of the commuters mentioned that they did not experience any health problems. Two percent of the commuters suffered from headache and 1% each from dizziness and sleepiness (Figure 3.21). Therefore, we could conclude that travelling by metro does not result in any health effects on the commuters and is one of the safest modes of public transportation system.
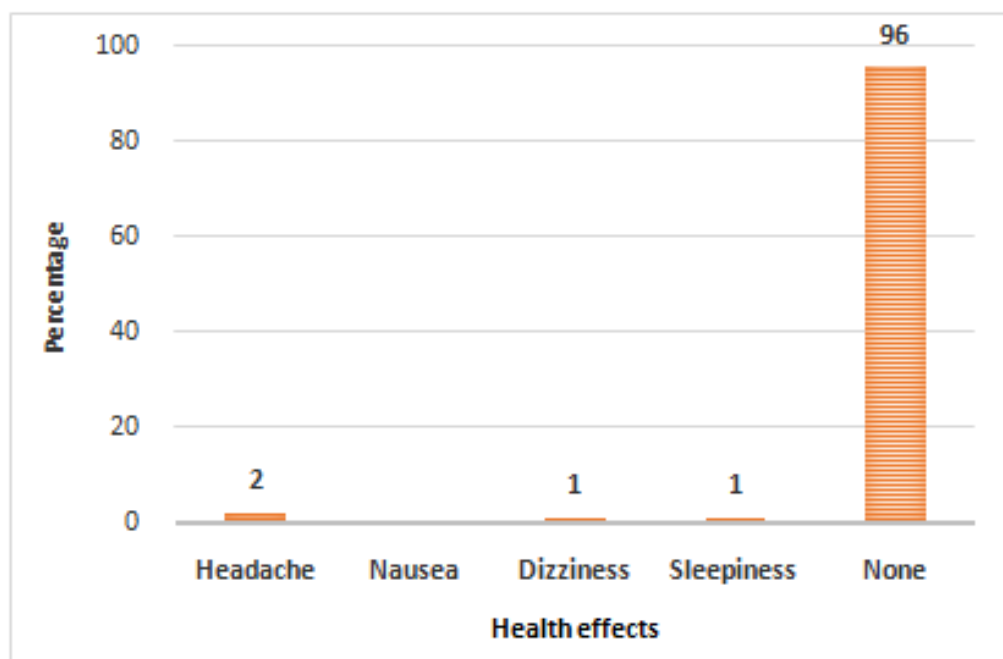
Figure 3.21 Commuters response on health effects due to travel in metro

Eighty three percent of the commuters stated that there was reduction in sound levels whereas 17% felt that there was no change in the present sound levels (Figure 3.22). A larger percentage of commuters opined that there was significant reduction in sound levels due to replacement of larger number of vehicles on road. From this it is evident that, there is considerable modal shift from a previous mode of transport to the metro rail.
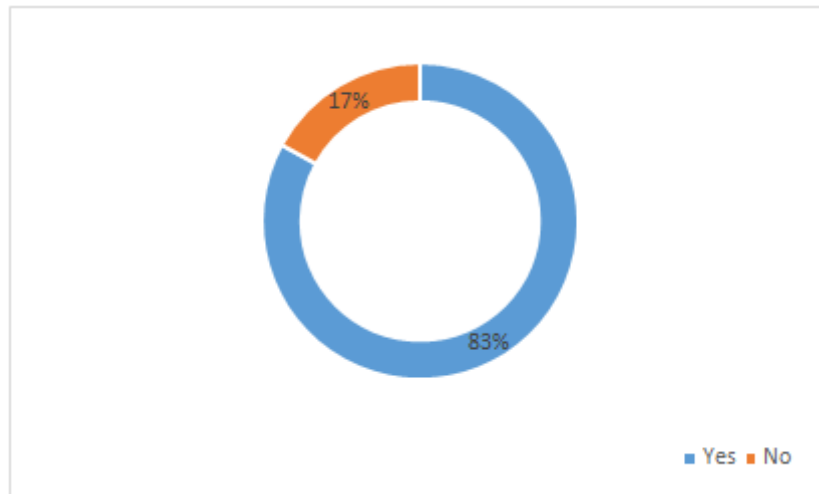
Figure 3.22 Commuters response on reduction in sound levels

The commuters were sought response about one significant factor of metro rail services that made them to shift from a previous mode of transport to metro. About 87% of the commuters stated that reduction in transit time was a significant factor for them to opt for modal shift. Prior to usage of metro, the commuters spend several hours commuting to their destination. The time saved in travelling could be constructively spent doing other works. Therefore, a larger population of the commuters felt that time was the most important factor for them to opt for metro. The other commuters opted to transit by metro rail as it was found to be comfortable (40%), convenient (36%) and have good ambience (10%) (Figure 3.23).

Table 3.15 Commuters response on significant factor of metro rail

Significant factor	Respondent	
	Number	Percentage
Time	926	87
Comfort	419	40
Convenience	377	36
Ambience	101	10
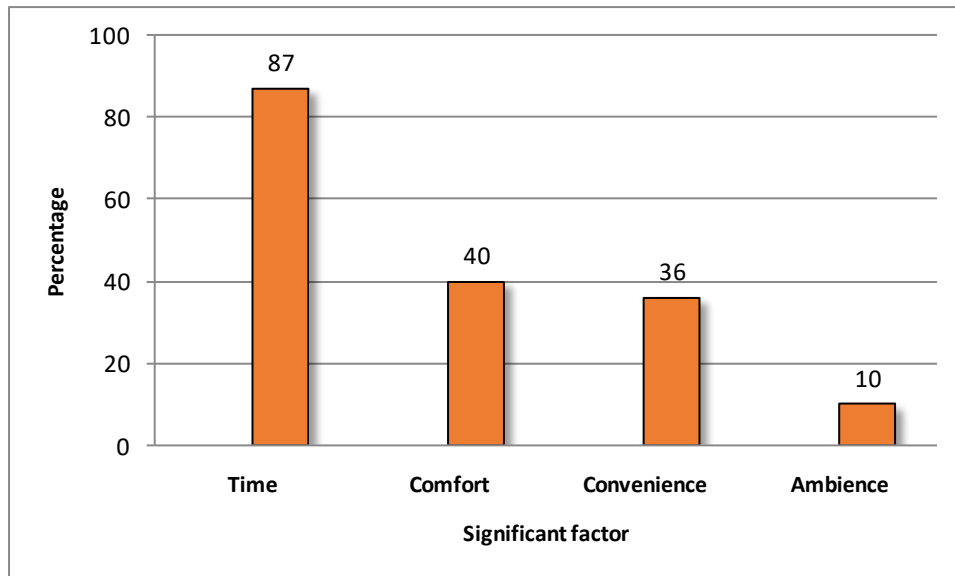
Figure 3.23 Commuters response on significant factor of metro rail

The CART (Classification and Regression Tree) analysis to identify the attributes that are driving to use metro rail

The Classification and Regression Tree analysis is a powerful analytical tool that helps to determine the most 'important' variables in a particular dataset and which helps build a potent explanatory model (Jake Morgan, 2014). In the present study, the model is used to identify the factors that compel the commuters to travel in metro most frequently.

- ✓ The constructed model shows that cost per trip is the most significant factor among all the other variables considered for the study. If cost per trip is economical (<100), it leads to more frequent travel by the commuters. If the cost per trip is less than Rs.90/-, then around 89% of the commuters travel frequently by metro rail.

- ✓ The second most important factor is age of commuter. It shows that commuters of younger age group prefer to travel most frequently by metro rail (83%). If cost per trip is greater than Rs.100/- and age of commuter is less than 45 years, then there is greater probability of the commuter travelling more frequently using metro rail.

- ✓ The third most important factor is the parking facility at the metro stations. If parking facility is available at metro stations, then there is greater probability of commuters travelling using metro rail. If cost per trip is more than Rs.100/- and age of commuter is greater than 45 years and parking facility is available at the metro station, then 90% of the commuters travel most frequently by metro rail (Figure 3.24).
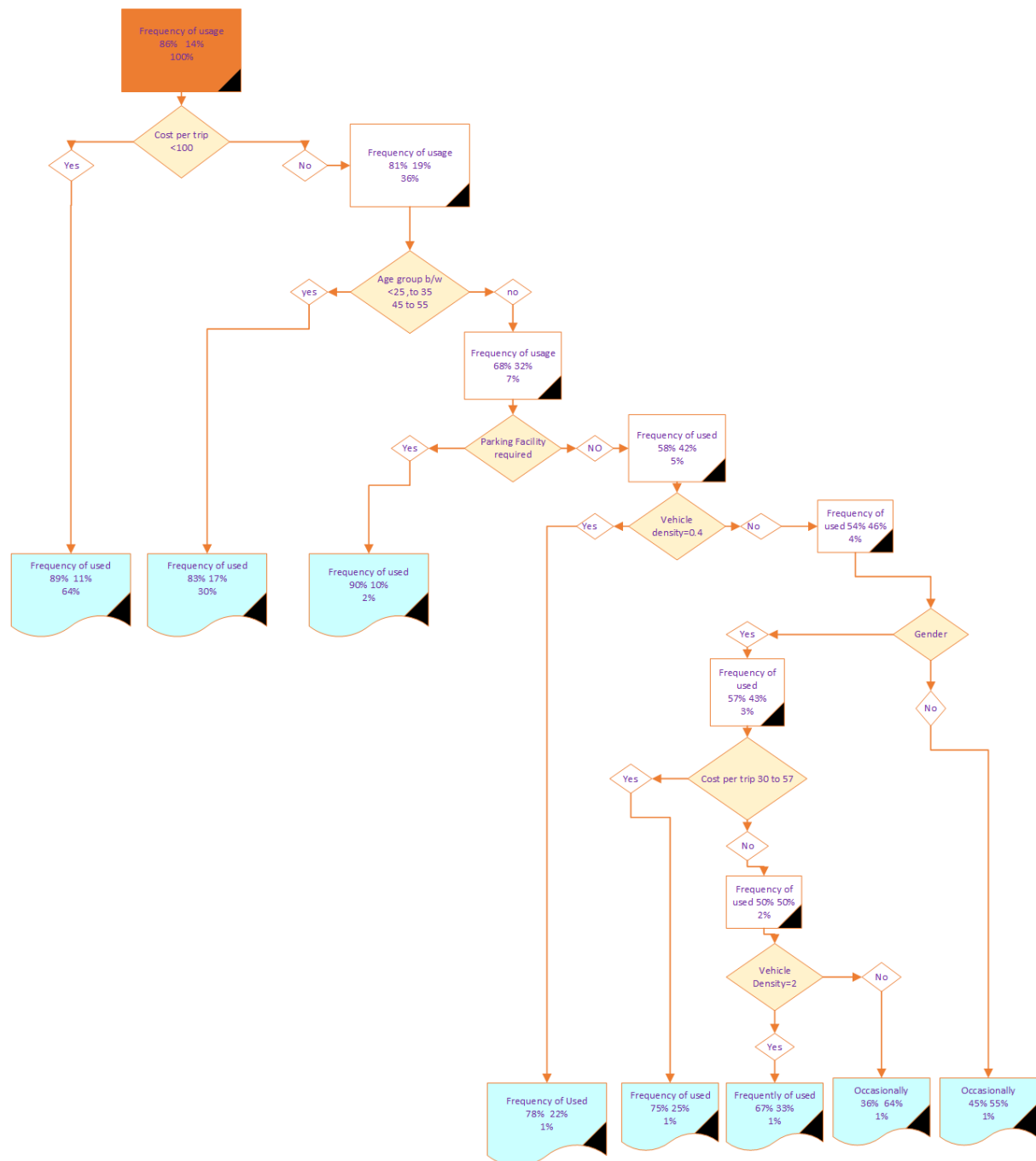
Figure 3.24 Machine Learning Model to identify attributes driving to use metro rail

4. LAST MILE CONNECTIVITY ANALYSIS

4.1.   Methodology
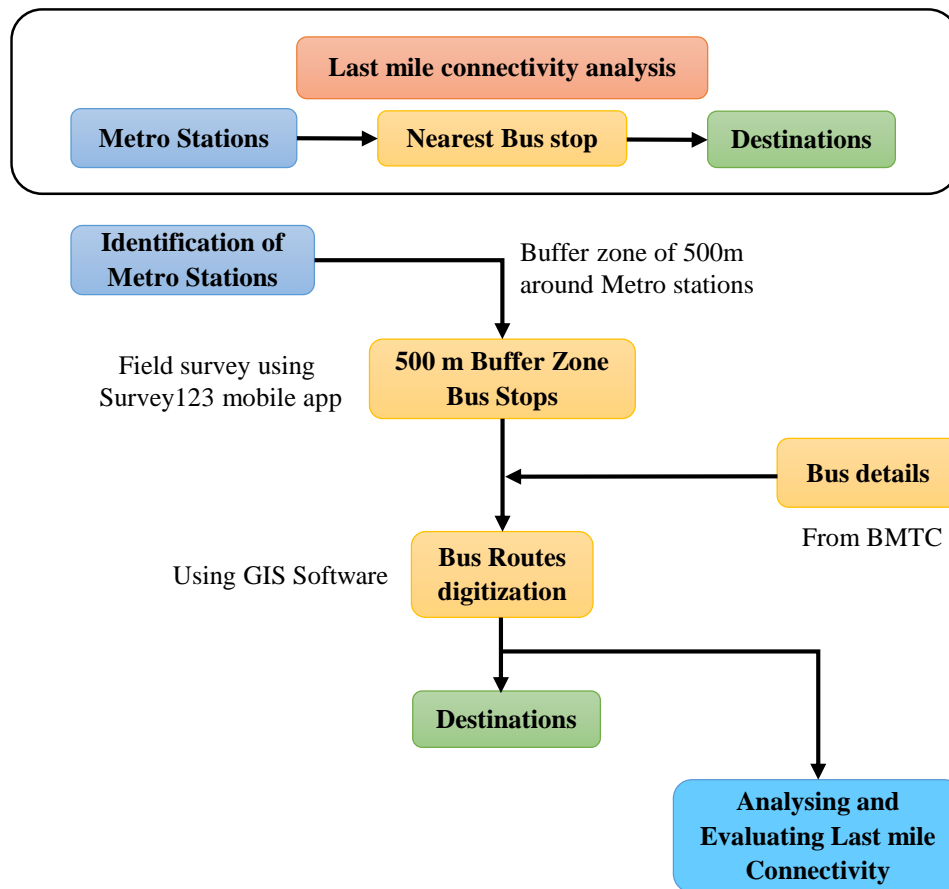
Figure 4.1. Methodology flow chart for Last mile Connectivity Analysis

The methodology for analysing Last mile connectivity is as shown in Figure 4.1. The metro stations were initially located on the GIS map and was verified during field survey using Survey123 for ArcGIS mobile app. For getting people effectively commuted from their home / destination to the nearest transit stop / station, the bus stops are desired to be located within 500m of walking distance from each metro stations. To achieve this objective a 500m spatial buffer zone was created around the Metro stations using buffer tool available in ArcGIS software. This facilitates in identifying the Bus stops within 500m of metro transit stations.

The spatial buffer zone of 500m created around the metro stations location was integrated into Survey123 mobile app. The field survey was then carried out using Survey123 mobile app to locate the metro stations and nearest bus stops in the vicinity of respective metro stations. Survey123 for ArcGIS is a simple form-centric data

collection GIS app. Using ArcGIS organizational account of EMPRI "smart form" was developed and used for field survey. The field survey and data collection is started by

| Screenshot 1 | Screenshot 2 | Screenshot 3 | Screenshot 4 |

Figure 4.2: Field Data collection using Survey 123 for ArcGIS mobile app
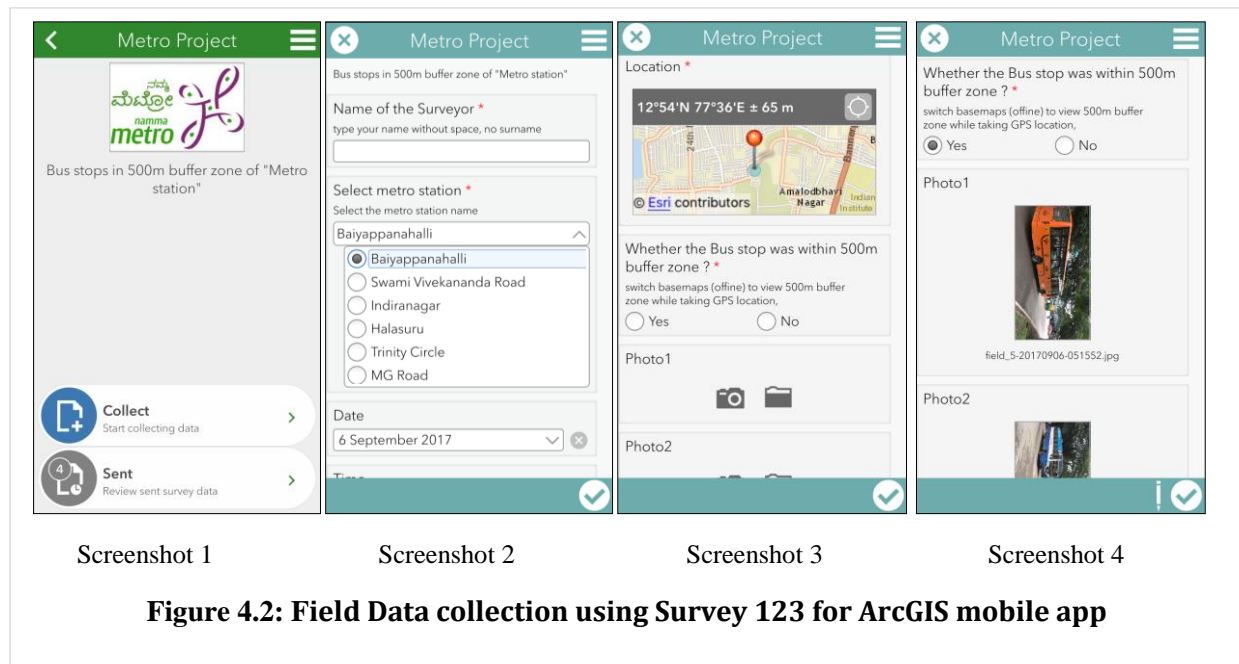
downloading "***Metro project***" smart form developed by EMPRI. This smart form inside the mobile app contains the GIS layers like locations of Metro stations, 500m buffer zone and street maps around them which can be used in identifying nearest bus stops.

The EMPRI field surveyor walked up to the nearest bus stops from each metro station and the mobile app displayed whether the bus stops fall within the range of 500m or not. If the bus stops were within the range the survey details were collected and recorded (refer figure 4.2). This mobile app, if working offline, the completed survey forms will be saved locally. When mobile is connected with internet data service, the survey details is submitted back to ArcGIS Server. This information is retrieved in the GIS server of the mobile app at EMPRI and re-validated for location with respect to 500m buffer zone of metro station. Finally the number of bus stops in the 500m range of metro stations were finalised and used for further exploration.

The finalised metro station bus stops were communicated to BMTC and the bus route numbers operating in each of the surveyed bus stops were obtained. The details of bus route numbers fetches details of all the connecting bus stops of individual buses operating from origin to destination via metro station connecting bus stops. The bus route details against respective bus route numbers were obtained from BMTC website (www.mybmtc.com).

The route wise details of bus stops from origin to destination were examined and metro station bus stops were identified. From the metro station bus stops the operating routes of buses were digitized for each bus connecting the metro stations to its last mile destinations. A spatial geodatabase was created for each metro station containing digitized bus routes as road network layer, origin, last mile connected destinations, bus route number, running length and nearest connected metro stations.

The spatial geodatabase of bus routes containing all the above mentioned details was utilized for creating a complex road network GIS layer. This was used to compute the number of last mile destinations connected (excluding the duplicates), total distance coverage, Kilometre run, ward wise connectivity, density of buses operating on road segment to segment basis(refer figure 4.3).

Ex: Individual digitized bus routes   Planarized lines   Route density map

Figure 4.3: Illustrative sample showing bus route density map process flow.
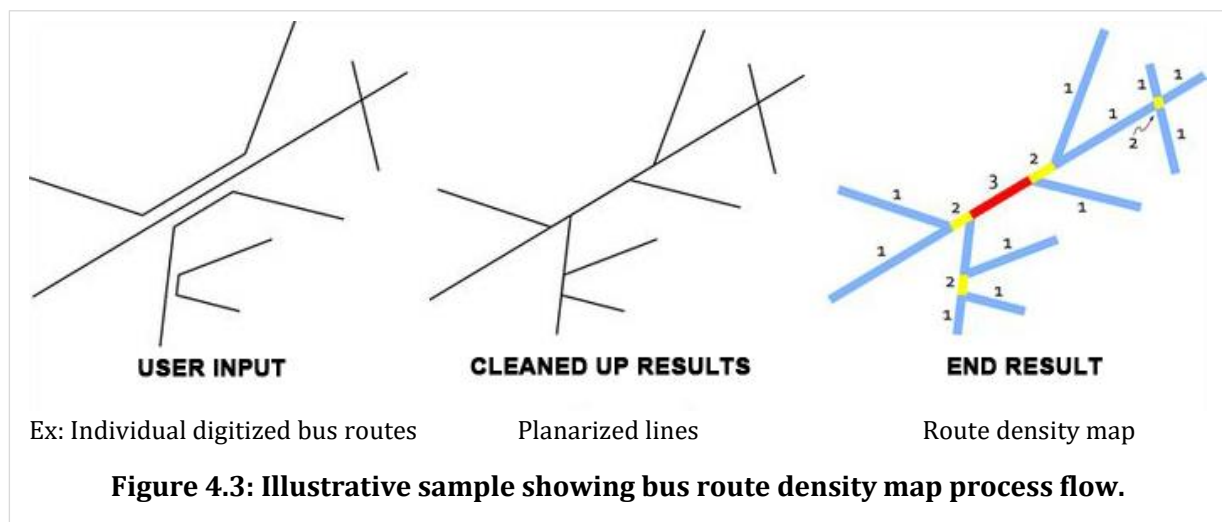
Various digitized bus routes were planarized and road network topology is built. This created road segments with attribute information of number of buses plying in each road segments. The end result of the planarized road network along with attribute information was the route density map. All the above details were analysed in evaluating last mile connectivity, assess the existing gaps and suggest mitigative measures.

4.2.   Results and Analysis

4.2.1 Identifications of spatial locations of Metro stations in purple line corridor

The metro stations was identified in the Phase-1, Purple line stretch of East-West corridor. There are total number of 17 metro stations(refer table 4.1) in the Purple line[1] starting with Baiyappanahalli Metro station in the East and Mysore Road Metro station in the West.

Table 4.1: Metro stations in East-West corridor is named Purple Line

Purple line			
Sl.no.	**Metro station**	**Latitude**	**Longitude**
1.	Baiyappanahalli	77°31'48" E	12°56'48" N
2.	Swami Vivekananda Road	77°32'13" E	12°57'08" N
3.	Indiranagar	77°32'01" E	12°57'43" N
4.	Halasuru	77°32'14" E	12°58'15" N
5.	Trinity	77°32'44" E	12°58'27" N
6.	Mahatma Gandhi Road	77°33'19" E	12°58'32" N
7.	Cubbon Park	77°33'57" E	12°58'33" N
8.	Vidhana Soudha	77°34'22" E	12°58'32" N
9.	M Visveswaraya Station	77°35'03" E	12°58'28" N
10.	Kempegowda Station	77°35'30" E	12°58'44" N
11.	City Railway Station	77°35'47" E	12°58'54" N
12.	Magadi Road	77°36'24" E	12°58'32" N
13.	Hosahalli	77°37'01" E	12°58'23" N
14.	Vijayanagar	77°37'36" E	12°58'35" N
15.	Athiguppe	77°38'19" E	12°58'42" N
16.	Deepanjali Nagar	77°38'42" E	12°59'09" N
17.	Mysore Road	77°39'09" E	12°59'27" N

4.2.2 Buffer zone of 500m from metro stations

The above metro stations and metro route was plotted in GIS platform and the spatial locations of 17 metro stations were identified. A 500m spatial buffer zone was created around the Metro stations using proximity tool called "Buffer" available in ArcGIS software. The input for this tool is the "metro stations" and the output is a polygon layer containing the buffer zone of 500m around the metro stations (refer map 01). This facilitates in identifying the Bus stops within 500m of metro transit stations using Survey123 for ArcGIS mobile app.

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[1] http://english.bmrc.co.in/ProjectProfile accessed during Dec-2017

Map 01 : Map Showing 500m buffer zone around metro stations and bus stops in East-West corridor
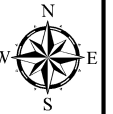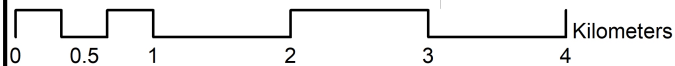
4.2.3   GIS based Field survey in 500m buffer zone of metro stations

To identify accessible Bus stops within 500m walking distance of commuters, a GIS based field survey was carried out by EMPRI. To carry out this survey on GIS platform Survey123 for ArcGIS mobile app – smart form was used. Various details such as name of the surveyor, bus stop name, GPS location, confirmation of bus stop lying in 500m buffer zone, photographs of the bus stop and surroundings and other relevant information is collected through the mobile app and retrieved in GIS sever (refer figure 4.4).

A total of 15 metro stations out of 17 were considered for the nearest bus stops survey. The two metro stations Kempegowda Station and Sir M Visveswaraya Station were excluded since it forms the Central hub for city buses which originates from these locations and connect to various parts of Bengaluru. The total number of 48 bus stops were found from the GIS based survey in the 500m buffer zone of 15 metro stations. The details of the nearest accessible bus stops for each of the metro stations were tabulated (refer Table 4.2). These finalized metro station bus stops are considered for collecting bus route details for further study.
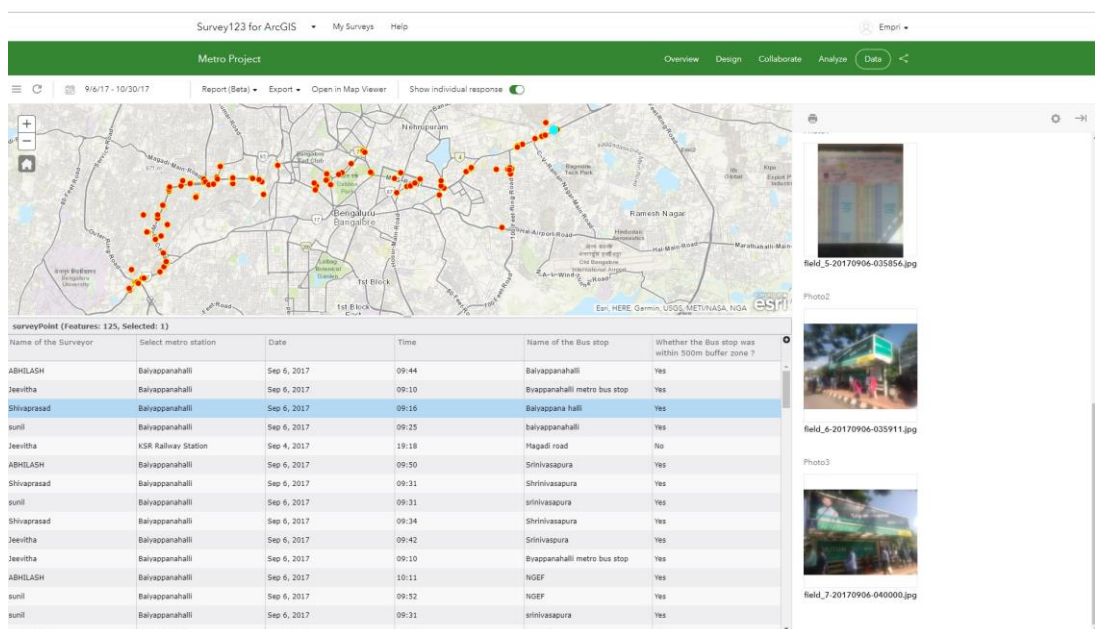
Figure 4.4: Completed survey of metro station bus stops received from mobile app, viewed in GIS server

Table 4.2: Metro station nearest bus stops in 500m Buffer zone

Sl.no	Metro Station		BMTC bus stops within 500m	Latitude	Longitude
1	Baiyappanahalli	1	Baiyappanahalli Metro Bus Stop / Srinivasapura	77°39'14" E	12°59'23" N
		2	Baiyappanahalli Back Gate	77°39'06" E	12°59'31" N
2	Swami vivekananda	1	Swami Vivekananda Metro Bus Stop / Sadananda Nagara	77°38'41" E	12°59'08" N
3	Indiranagar	1	CMH Double Road	77°38'12" E	12°58'42" N
		2	Indiranagar KFC 100 feet road	77°38'29" E	12°58'42" N
		3	Indiranagar Police Station/ Indiranagar KFC (Towards Domlur)	77°38'27" E	12°58'44" N
		4	Indiranagar KFC (Towards Chinmaya Road)	77°38'29" E	12°58'42" N
4	Halasuru	1	Halsuru Metro Stop /Adarsha Bus Stop	77°37'45" E	12°58'44" N
		2	CMH Road Lakshmipura	77°37'44" E	12°58'43" N
5	Trinity circle	1	Manipal Center	77°36'50" E	12°58'32" N
		2	Begum Mall	77°37'12" E	12°58'30" N
		3	Lido Mall	77°37'15" E	12°58'22" N
		4	Airforce Office Trinity Circle	77°37'11" E	12°58'15" N
6	M G road	1	MG Road Metro Stop	77°36'22" E	12°58'32" N
		2	MG Road Back Station	77°36'29" E	12°58'38" N
		3	Mayohall	77°36'35" E	12°58'24" N
		4	Brigade Road	77°36'24" E	12°58'17" N
7	Cubbon park	1	Balakundri circle	77°35'50" E	12°59'00" N
		2	Indian Express	77°35'47" E	12°59'02" N
		3	Indian Express (Towads Cunnigham Road)	77°35'48" E	12°59'01" N
8	Dr.B.R Ambedkar vidhansoudha	1	Vidhanasoudha bus stop	77°35'35" E	12°58'48" N
		2	Telephone Exchange	77°35'35" E	12°58'48" N
9	City railway station	1	Hunsemara 1st Cross	77°33'54" E	12°58'31" N
		2	Magadi Road 1st Cross	77°33'47" E	12°58'33" N
10	Magadi road	1	10th cross magadi road	77°33'25" E	12°58'32" N
		2	Prasanna(towards rajaji nagar)	77°33'09" E	12°58'34" N
		3	Prasanna(towards vijay nagar)	77°33'05" E	12°58'26" N
11	Hosahalli	1	Tollgate (Towards Dasarahalli)	77°33'00" E	12°58'25" N
		2	Tollgate (Towards vijaynagar)	77°32'55" E	12°58'28" N
		3	Tollgate (Towards WOC)	77°32'54" E	12°58'31" N
		4	Manuvana	77°32'40" E	12°58'27" N
		5	M.C.layout	77°31'31" E	12°58'30" N
		6	Binny layout, J.P.Park	77°32'47" E	12°58'13" N
12	Vijaynagar	1	Vijaynagar	77°32'17" E	12°58'19" N
		2	Vijaynagar Water Tank	77°32'17" E	12°58'23" N
		3	Maruthi Mandir	77°32'10" E	12°58'04" N

Sl.no	Metro Station		BMTC bus stops within 500m	Latitude	Longitude
13	Attiguppe	1	Vijaynagar TTMC	77°32'05" E	12°57'54" N
		2	Subbanna Garden	77°31'49" E	12°57'54" N
		3	Hampinagara	77°32'08" E	12°57'31" N
		4	R.P.C Layout 7th Main	77°32'15" E	12°57'44" N
		5	Income Tax Layout	77°31'53" E	12°57'36" N
		6	Attiguppe	77°32'02" E	12°57'28" N
14	Deepanjali nagar	1	Deepanjali nagar / KAVIKA Layout	77°32'14" E	12°57'04" N
		2	BHEL	77°32'12" E	12°56'59" N
15	Mysore road	1	Mysore road metro station	77°31'50" E	12°56'47" N
		2	Nayandahalli signal (Towards Banashankari)	77°31'40" E	12°56'43" N
		3	Nayandahalli signal (Towards Rajkumar Samadhi)	77°31'41" E	12°56'42" N
		4	Gangondanahalli masjid road	77°31'36" E	12°56'56" N

4.2.4 Data collection on Bus routes

The bus route numbers shuttling from these bus stops were collected (refer table 4.3 and Annexure -1) from Bangalore Metropolitan Transport Corporation (BMTC). The bus route details against respective bus route numbers were obtained from BMTC website (www.mybmtc.com) accessed during August – November 2017. The bus route details such as origin, enroute bus stops and destinations were extracted from BMTC website and tabulated (refer Annexure - 2). Using these details, the metro station nearest bus stops were identified in the enroute bus stops list and the last mile connected destinations were also noted for further analysis.

Table 4.3: Number of Buses operational in metro station bus stops.

Sl.no	Metro Station	Total Bus routes	BMTC bus stops within 500m	No. of Bus routes
1	Baiyappanahalli	201	Baiyappanahalli Metro Bus Stop / Srinivasapura	188
			Baiyappanahalli Back Gate	13
2	Swami vivekananda	201	Swami Vivekananda Metro Bus Stop / Sadananda Nagara	201
3	Indiranagar	82	CMH Double Road	27
			Indiranagar KFC 100 feet road	6
			Indiranagar Police Station/ Indiranagar KFC (Towards Domlur)	22
			Indiranagar KFC (Towards Chinmaya Road)	27
4	Halasuru	224	Halsuru Metro Stop /Adarsha Bus Stop	194
			CMH Road Lakshmipura	30

Sl.no	Metro Station	Total Bus routes	BMTC bus stops within 500m	No. of Bus routes
5	Trinity circle	268	Manipal Center	1
			Begum Mall	20
			Lido Mall	224
			Airforce Office Trinity Circle	23
6	M G road	302	MG Road Metro Stop	4
			MG Road Back Station	50
			Mayohall	246
			Brigade Road	2
7	Cubbon park	225	Balakundri circle	114
			Indian Express	45
			Indian Express (Towads Cunnigum Road)	66
8	Dr.B.R Ambedkar Vidhansoudha	50	Vidhanasoudha bus stop	45
			Telephone Exchange	5
10	City railway station	141	Hunsemara 1st Cross	68
			Magadi Road 1st Cross	73
11	Magadi road	257	10th cross magadi road	141
			Prasanna(towards rajaji nagar)	48
			Prasanna(towards vijay nagar)	68
12	Hosahalli	338	Tollgate (Towards Dasarahalli)	101
			Tollgate (Towards vijaynagar)	68
			Tollgate (Towards West of Cord Road)	18
			Manuvana	116
			M.C.layout	30
			Binny layout, J.P.Park	5
13	Vijaynagar	238	Vijaynagar	101
			Vijaynagar Water Tank	35
			Maruthi Mandir	102
14	Attiguppe	255	Vijaynagar TTMC	111
			Subbanna Garden	6
			Hampinagara	14
			R.P.C Layout 7th Main	13
			Income Tax Layout	32
			Attiguppe	79
15	Deepanjali nagar	248	Deepanjali nagar / KAVIKA Layout	77
			BHEL	171
16	Mysore road	210	Mysore road metro station	171
			Nayandahalli signal (Towards Rajkumar Samadhi)	4
			Nayandahalli signal (Towards Banashankari)	33
			Gangondanahalli masjid road	2

(Refer Annexure-1 for Bus route number details)

4.2.5 Digitization of Bus routes

ArcGIS software was used and the bus routes were digitized based on background street maps and open source google maps (refer figure 4.5), starting from metro station nearest bus stops, running through the enroute bus stops up to the last mile destinations. These routes digitized on GIS platform gives comprehensive details of origin, distance and bus stops covered along the bus route and finally the last mile destination connectivity from the metro stations.

Figure 4.5: Digitization of bus routes on open source street maps in ArcGIS software.

This is then transformed into a geospatial database which can be used to perform last mile connectivity analysis.

4.2.6 Location of Last mile destinations.

The geospatial database prepared contains information of Last mile destinations, route details, length of distances covered by buses starting from metro station nearest bus stops to the end point. Using the spatial geodatabase, ArcGIS is used to generate reports from attribute information. Several buses may shuttle to same destination. The duplications of last mile destinations are eliminated using tools available in ArcGIS. Finally, Last mile destinations with respect to each metro station is used for report generation from ArcGIS outcomes.

4.3. Evaluating connectivity

The Last mile connectivity is evaluated based on various parameters such as the number of destinations which is connected to each metro station bus stops, the total distance covered, and the density of buses travelling via different sectors (wards) of the city. The above evaluations are carried out on a spatial analysis and explained in detail in the following sections,

4.3.1. Last mile destinations coverage

The total destinations covered from a particular metro station bus stop signifies that a commuter can access the metro services from the farthest destination or from various localities of Bangalore City. This evaluates the ease with which passengers can access metro services and commute to different parts of the city timely and efficiently. The outermost destination covered by BMTC services in Eastern side of metro corridor is Nelavagilu in Hosakote Taluk and on the west side of the metro corridor is Biskur in Magadi Taluk.

A total of 554 destinations can access the metro services on East – West corridor through the metro station BMTC bus stops, 285 destinations being on the eastern side and 269 on the western side (refer map 02). The details of metro station wise accessible number of last mile destinations has been tabulated below (refer table 4.4) and further details can be referred from annexure -3.

Table 4.4: Number of destinations directly connected by metro station bus stops

Sl.no	Metro Station	No. of destinations
1	Baiyappanahalli	145
2	Swami vivekananda	145
3	Indiranagar	22
4	Halasuru	166
5	Trinity circle	178
6	M G road	198
7	Cubbon park	92
8	Dr.B.R Ambedkar vidhansoudha	44
10	City railway station	103
11	Magadi road	127
12	Hosahalli	156
13	Vijaynagar	94
14	Attiguppe	86
15	Deepanjali nagar	181
16	Mysore road	141

(Refer Annexure – 3 for destination details)

Map 02 : Map showing Last mile destinations covered by metro station bus stops

77°15'0"E 77°30'0"E 77°45'0"E 78°0'0"E

13°15'0"N

Devanahalli

Nelavagilu

Koratagere doddi

Nelamangala

Biskur

Ummalu

13°0'0"N

Sripathihalli

Jayamangala

Alamabadi

Heligeehalli colony

12°45'0"N

Sugganahalli

Attibele

Tataguppe

Annahalli

EMPRI
Environmental Management &
Policy Research Institute
Centre for Geo-informatics

1:250,000
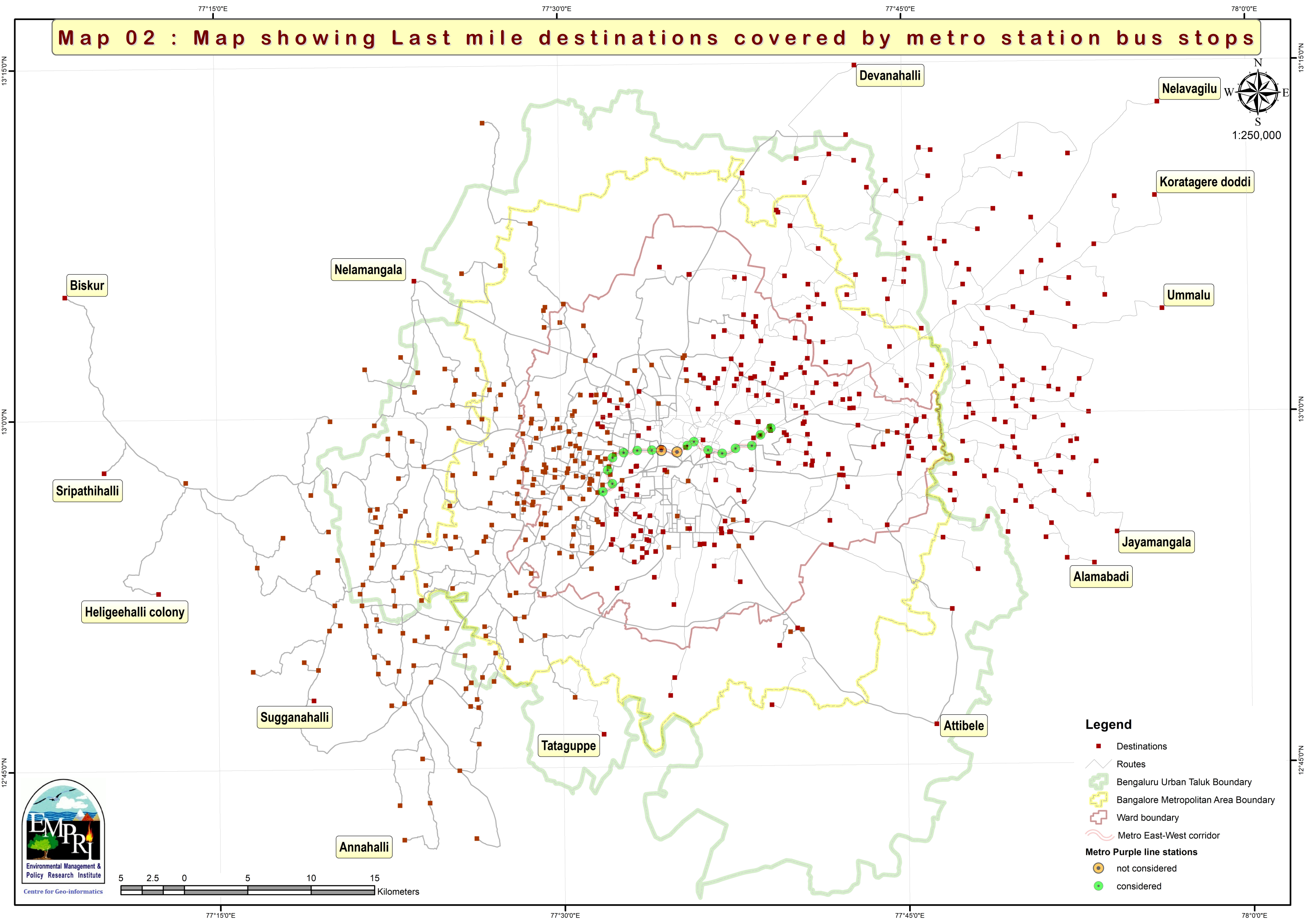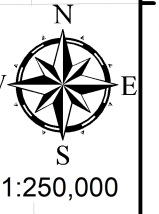
Legend

■ Destinations

╱╲ Routes

▨ Bengaluru Urban Taluk Boundary

▨ Bangalore Metropolitan Area Boundary

▨ Ward boundary

≈ Metro East-West corridor

Metro Purple line stations

⊙ not considered

● considered

5   2.5   0   5   10   15
|___|___|___|_____|_____|_____| Kilometers

77°15'0"E 77°30'0"E 77°45'0"E 78°0'0"E
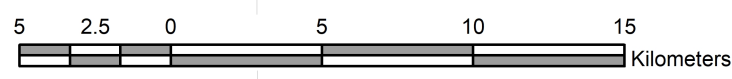
4.3.2. Total distance coverage

The overall distance covered by the BMTC busses in the metro accessible routes is analysed and computed based on the digitized bus routes from spatial geodatabase. The spatial geodatabase contains the bus route numbers, routes of various busses with their distance run in their respective routes. This data can be categorized metro station wise which appraises the longest distance coverage and distribution of accessibility.

The total distance covered is an important outcome of spatial analysis which in turn can be used to estimate the CO_2 emissions. UNDP has published guide on quantitative estimation of reduction in greenhouse gas emissions by individual actions by the use of transport such as public or private transport choices[2]. Any reduction in the distance covered due to modal shift from road transport to metro rail can be identified and corresponding CO_2 emission saving can be estimated. In the current study, the total distance coverage by BMTC busses from each metro station bus stops is calculated from spatial analysis (refer table 4.5). This is useful in computing carbon emissions during further studies.

Table 4.5: Total Distance covered by bus routes from each metro station bus stops.

Sl.no	Metro Station	Total Distance covered by Bus routes in Km	
1	Baiyappanahalli	458.2	Km
2	Swami vivekananda	459.1	Km
3	Indiranagar	67.5	Km
4	Halasuru	984.7	Km
5	Trinity circle	1,052.2	Km
6	M G road	1,230.3	Km
7	Cubbon park	453.1	Km
8	Dr.B.R Ambedkar vidhansoudha	159.1	Km
10	City railway station	430.7	Km
11	Magadi road	478.9	Km
12	Hosahalli	651.0	Km
13	Vijaynagar	405.9	Km
14	Attiguppe	444.9	Km
16	Deepanjali nagar	815.6	Km
16	Mysore road	712.6	Km
	Total	**8,803.8**	**Km**

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[2] UNDP Publication, Environment & Energy, Low carbon lifestyles - a quantitative estimation of reduction of greenhouse gas emissions by individual actions

4.3.3. Density of buses in each stretch of metro route

The density of buses in GIS user interface depicts various stretches of road network which are highly dense where large number of buses operate. These stretches are indications of possible traffic congestions. With the use of ArcGIS software the number of busses operating in each segments of road stretch is generated by spatial joining techniques. The basic inputs for computations of density of buses are digitized bus routes, nodes and junctions created segment to segment of roads in the GIS road network layer.

In this study, certain stretches of road network are identified (refer Map 03 and Map 04) where considerably more buses operate which can be further analysed and suggestive measures can be provided for modal shift from road transport to metro rail services in such stretches. This can reduce carbon emissions in the Central business district (CBD) area and traffic congestions can be mitigated to a greater extent. In other words, commuters from outermost and various localities reaching metro stations bus stops can use metro rail services to reach CBD areas. Accordingly, repetitive BMTC buses operating from various last mile destinations converging towards a common route and shuttling to central bus stations can be operated by use of satellite bus terminals / Metro station bus stops as end point and avoid traffic congestions inside central city areas.

Map 03 : Map Showing number of Buses running parallel to Metro corridor
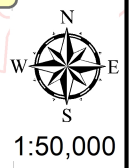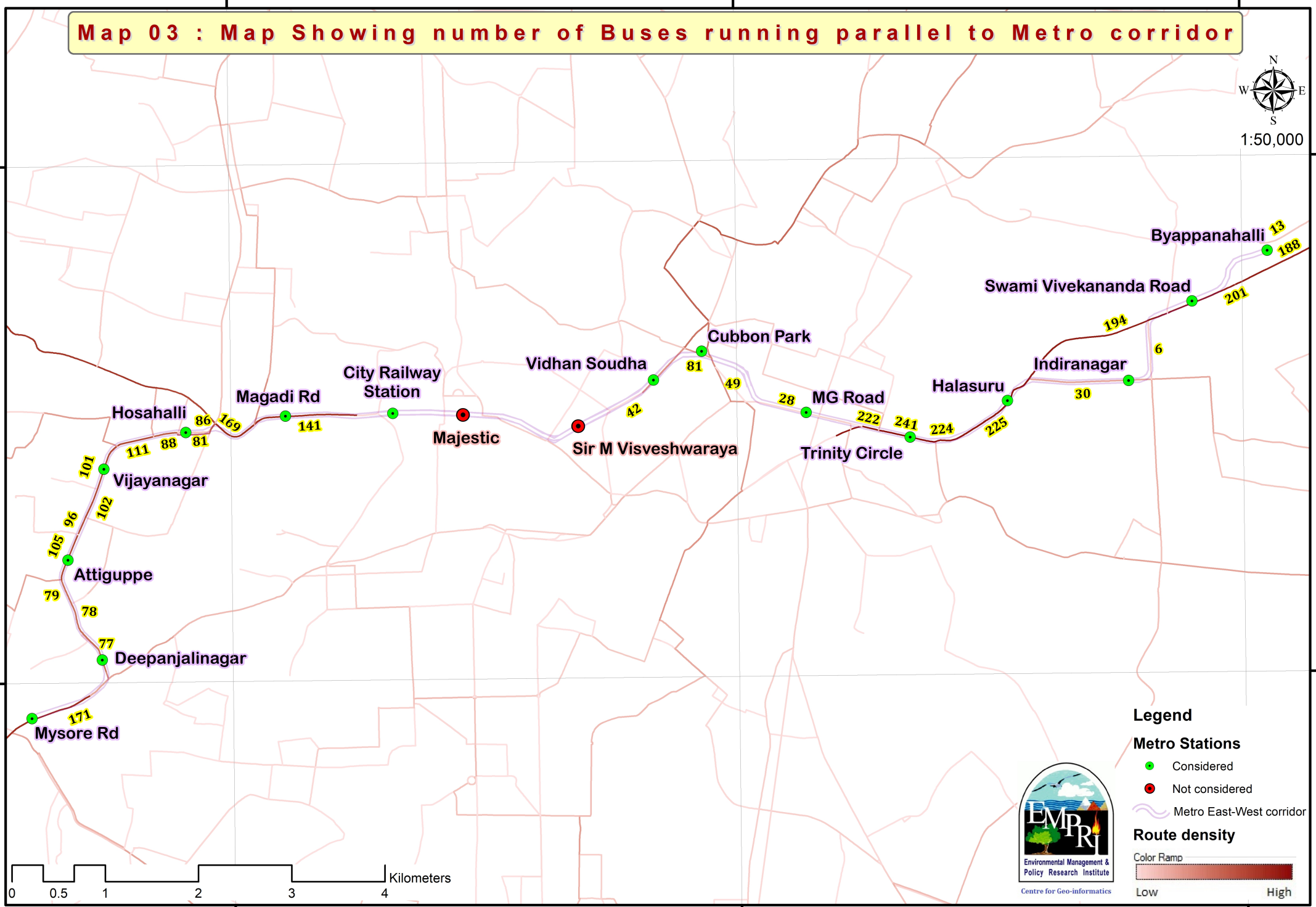
Map 04 : Map showing route density for number of buses connected to metro station bus stops

Devanahalli

Nelavagilu

Koratagere doddi

Nelamangala

Ummalu

Biskur

Sripathihalli

Jayamangala

Alamabadi

Heligeehalli colony

Sugganahalli

Attibele

Tataguppe

Legend

Bengaluru Urban Taluk Boundary

Bangalore Metropolitan Area Boundary

Ward boundary

Last mile destinations

Route density
Color Ramp

Low   High

EMPRI
Environmental Management &
Policy Research Institute

Centre for Geo-informatics

1:250,000

5 2.5 0   5   10   15
Kilometers

4.3.4. Ward wise coverage

From the administrative point of view it is necessary to assess ward wise accessibility to the metro services. In this study, spatial overlay analysis has been carried out to know the number of busses running in each of the ward limits. This provides details on the density of busses running through each wards using which sparsely and well-connected wards can be identified.

Table 4.6: Number of wards connected by metro station bus stops

Sl.no	Metro Station	No of wards covered
1	Baiyappanahalli	26
2	Swami vivekananda	26
3	Indiranagar	39
4	Halasuru	51
5	Trinity circle	56
6	M G road	90
7	Cubbon park	127
8	Dr.B.R Ambedkar vidhansoudha	68
9	City railway station	84
10	Magadi road	109
11	Hosahalli	146
12	Vijaynagar	148
13	Attiguppe	158
14	Deepanjali nagar	155
15	Mysore road	139

(Refer Annexure – 4 for details of ward numbers for each metro station)

From the geospatial analysis, the well-connected ward happens to be 111-Shanthala Nagar and 2-Chowdeshwari ward, 116 - Nilasandra, 171- Gurappanapalya wards are having poor connectivity to the metro services on East – west corridor. The ward wise GIS analysis (refer Map 05) shows that there is a directional trend of well-connectivity to various localities on the East-West direction and comparatively less connectivity in the North- South direction.

Map 05 : Map showing ward wise coverage of last mile connectivity by metro services
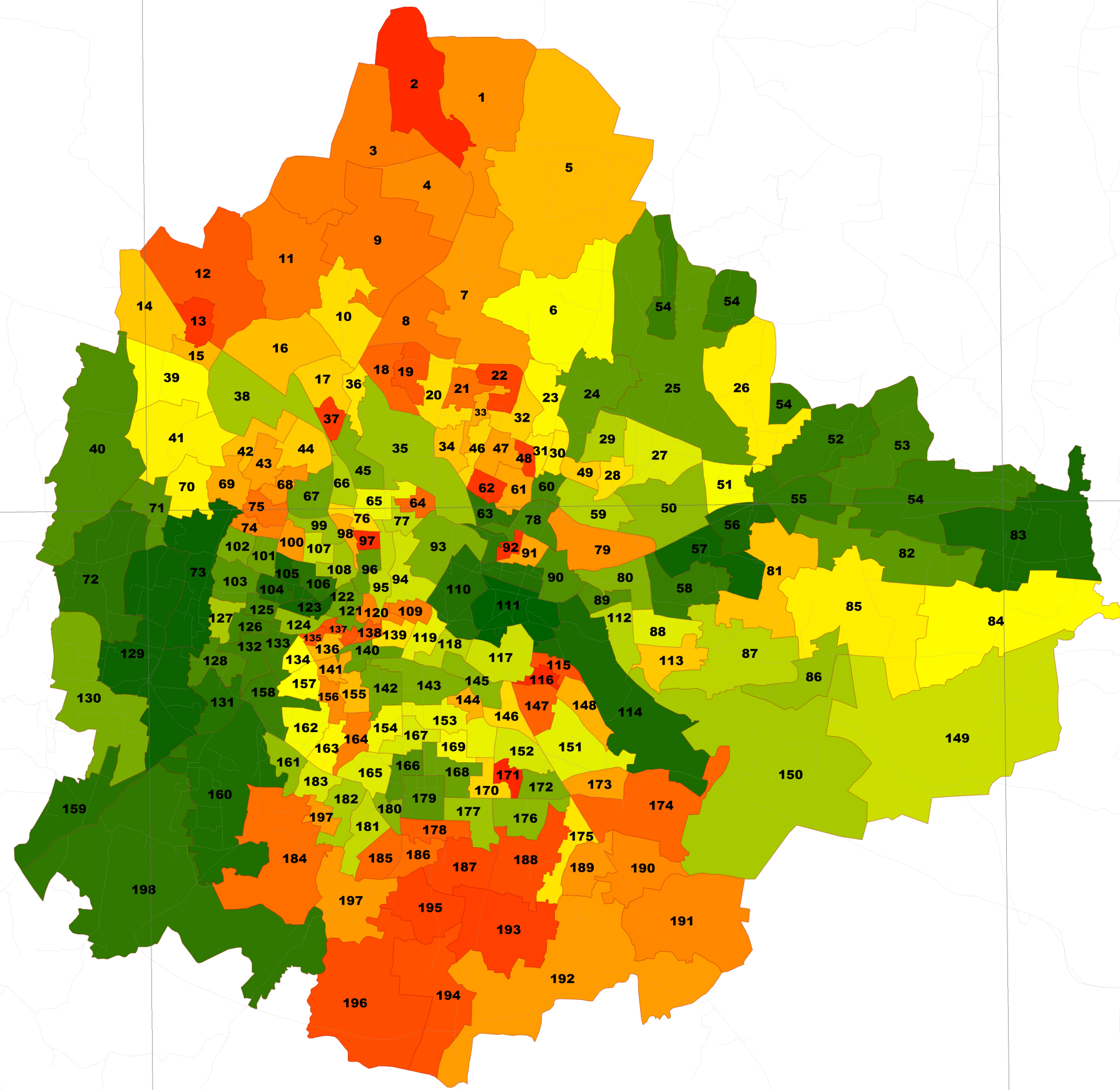
5. KEY FINDINGS

5.1. Findings of Socio-Economic and Environmental Impacts Survey

1] Maximum number of metro rail commuters are travelling to home or station by bus, taxi, car, auto rickshaw and two-wheeler and are reaching within 30minutes.

2] Most of the metro users who travel most frequently or occasionally belonged to the age group of 25-35years.

3] Equal number of male and female commuters are daily using the metro, more number of males commuters are travelling weekly as well as occasionally compared to female commuters.

4] Commuters holding above bachelor's degree are more frequently using the metro services. More than 94% of commuters were holding Bachelor's degree and above.

5] More number of commuters who travelled once in a fortnight (47%) or once a month (60%) were using public transport to reach their home or station.

6] Daily and occasionally travelling commuters said that there was complete safety by using metro.

7] Sixty four percent of the commuters travelling using private vehicle to reach station or home have issues with parking facility at the metro stations.

8] The commuters travelling occasionally stated that, the reduction of vehicle density is partially reduced after introduction of the metro rail (60%).

9] Forty three percent of the commutes agreed that the travelling cost has reduced by Rs.21-50 per trip.

10] Forty one percent of the commuters walked to the metro station as they were staying in the nearby vicinity.

11] Seventy percent of the commuters used metro services on a daily basis.

12] Ninety nine percent of the commuters stated that metro reduces travel time when compared to other means of transport.

13] Ninety percent of the commuters reached their destination within 30 minutes.

14] Survey states that 68% of the commuters opined that there was reduction in travel cost.

15] Ninety five percent of the commuters opined that metro rail is convenient form of transport compared to others.

16] Ninety nine percent of the commuters stated that metro is the safest mode of public transportation.

17] Connectivity, frequency and parking are the major areas that require improvement,

18] Most of the commuters of the following stations have sought for improvement in connectivity as well as frequency:

- Mysore Road
- Baiyapanahalli
- Hosahalli
- Majestic

5.2. Findings from Last mile Connectivity Analysis

19] The Bengaluru Metro on the East-west Purple line corridor has 48 bus stops within walkable distance of 500m around metro stations. The accessible Bus stops for each metro stations has been mentioned in table 2. The destinations from these bus stops, bus route numbers can be referred from Annexure-1.

20] M G Road metro station bus stops on the eastern side of the metro corridor has most number of buses shuttling to various last mile destinations. 198 last mile destinations have direct access to metro services on the eastern corridor of namma metro through MG road metro station.

Deepanjali nagar metro station bus stops on the western side of the metro corridor has maximum number of buses operating to different last mile destinations. 181 last mile destinations are directly accessible by namma metro commuters through Deepanjali nagar metro station bus stops.

21] Dr.B.R Ambedkar vidhansoudha metro station bus stops has comparatively least number of buses connecting last mile destinations on the eastern side of the metro corridor and Attiguppe metro station bus stops has less bus count which are having direct last mile connectivity. Only 44 last mile destinations are directly accessible by Dr.B.R Ambedkar vidhansoudha metro station bus stops and only 86 last mile destinations are covered by Attiguppe metro station bus stops.

22] Total bus routes running length is 2481.87Km which are considered for metro last mile connectivity analysis on the east-west corridor. These bus routes operate between origin and destinations and has metro station access enroute the

passenger trip. M G Road metro station bus stops has 302 number of buses and Hosahalli metro station bus stops has 338 number of buses operating to various destinations. Although maximum number of buses in Deepanjali nagar metro station bus stops operate, the diversity of last mile destinations achieved by Hosahalli metro station bus stops is greater.

23] Ward wise connectivity analysis carried out using GIS spatial analysis tools reveal that the "namma metro" services are well connected to various wards is in East-West direction and comparatively less connected in the North- South direction. Ward no. 111-Shanthala Nagar is most connected by large number of buses and Wards 2-Chowdeshwari ward, 116 - Nilasandra, 171- Gurappanapalya are having comparatively poor connectivity to the metro services on East – west corridor.

6. CONCLUSIONS

1] Commuter's preference to mass transit system has increased ever since its launch but the traffic congestion has not reduced significantly.

2] In spite of increase in commuter population in metro, the pollution levels have not reduced significantly and so is the fuel consumption.

3] Metro has emerged as safe mode of transport, but still commuters continue with unsafe modes of transport due to limited connectivity of the metro rail.

4] The Bengaluru Metro on the East-west Purple line corridor has good accessibility to bus stops within walkable distance of 500m around metro stations.

5] Purple line Metro station bus stops connect to several last mile destinations spread across the city and study shows well connectivity to destinations in the East – West direction.

6] Ward wise connectivity analysis carried out using GIS spatial analysis tools reveal that the "namma metro" services are well connected to various wards is in East-West direction and comparatively less connected in the North- South direction.

7] Repetitive BMTC buses operating from various last mile destinations converging towards a common route and shuttling to central bus stations can be operated by use of satellite bus terminals / Metro station bus stops as end point and avoid traffic congestions inside central city areas.

8] Traffic congestion stretches from the route density map can be undertaken to reduce the excess bus transport and corresponding CO_2 emission saving can be estimated.

7. SCOPE FOR FUTURE RESEARCH

1] During the course of the study, it was perceived that only, scanty information is available on pollutants such as PM2.5 PM10, NOx, SOx and CO in both the E-W and N-S corridor of the metro rail. A detailed study of the above pollutants over a period of time will help in analysing the difference in concentration of pollutants before and after the launch of metro rail.

2] Estimation of greenhouse gas emissions from transportation sector could also be helpful in terms of computing it with the number of vehicles replaced on road due to usage of metro rail by the commuters.

3] The last mile connectivity aspects for both the stretches could be studied simultaneously which would help us to identify areas in the city that are untouched by feeder services.

4] Traffic volume count for number of vehicles in baseline scenario and future scenario with Metro and without metro in particular stretches needs to be studied. This can be used for estimating CO_2 emission saving due to modal shift from road transport to metro rail.

5] The number of buses and bus route numbers identified in this study for each metro station can be considered to further analyse the number of trips made by each buses. Buses with less occupancy and possible buses where passengers can shift to metro rail instead of road transport can be avoided. This reduction in buses will reduce GHG emissions over the estimated baseline emissions without metro.

6] The existing gaps in connecting last mile destinations and wards can be connected by planning Radial network (refer figure 7.1) of feeder connectivity from nearest metro station bus stops.
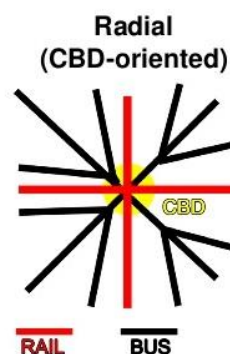
Figure 7.1: representative sketch of Radial connectivity

8. RECOMMENDATIONS

1] Parking facility to be provided at all metro stations to attract more number of commuters to travel by metro rail.

2] Provision of cycling lanes along the metro corridors would facilitate more number of commuters to opt for metro rail.

3] To publicize the metro bikes facility offered in few stations and to extend it across the whole corridor of the metro rail.

4] More number of coaches to be added to the existing structure, which in turn would facilitate more commuters per trip.

5] Display boards can be put up at each metro station which can guide metro users to access nearest bus stops and the bus route numbers available at metro station bus stops. Annexure – 1 and 2 gives the details of nearest bus stops and bus route numbers at respective metro station bus stops

6] Existing gaps are depicted in the ward wise connectivity map which portrays the wards which are well connected and sparsely connected by direct metro access. Annexure 4 provides details of wards accessible for commuters from each metro station. Other wards which are of prime importance may be connected to the metro station based on public demand and usage.

7] The ward wise connectivity for the East west metro corridor shows a positively well connected directional trend in the same East-west direction. However it is necessary for the North-South metro corridor to be studied in a similar way to evaluate the connectivity to a complete scale.

8] Route Density analysis has been carried out in this study which can be further utilized to analyse traffic congestions using bus frequency and occupancy data. This can be used to suggest possible modal shift strategies from road transport to metro services in core areas of Bengaluru city and in turn can estimate the reduction in GHG emissions due to use of Green Mass Rapid Transit System (MRTS).

9] Traffic volume count for present and future scenario needs to be conduct to assess the reduction CO_2 emission due to shifting of passengers from motor vehicles to metro rail.

9. REFERENCES

Annual report 2015-16, Transport Department, Government of Karnataka

Bag S, Sen S (2012) Kolkata metro railway and customer satisfaction: An empirical study, International Journal of Multidisciplinary Research 2(3):165-176.

BMRC (2012) http://www.bmrc.co.in/English/about_us.htm/2012. Accessed on 14 July 2017

BMRCL (2017) english.bmrc.co.in. Accessed on 23 December 2017

BMTC (2017) Bengaluru Metropolitan Transport Corporation, BMTC at a Glance

Chidambara(2012) www.transit2012.in/common/uploads/theme_E%20session%201%20regency%20I/3 80-paper-transedAbstract00073.pdf. Accessed on 23 December 2017

CTTP (2011) Comprehensive Traffic and Transportation Plan for Bengaluru – Final Report, Karnataka Urban Infrastructure Development and Finance Corporation.

CSE (2015) http://bangalore.citizenmatters.in/articles/bengaluru-could-be-the-next-city-after-delhi-to-be-hit-by-air-pollution?utm_source=copy. Accessed on 26 May 2017

Ding A, Zhang LN (2016) A Travel Mode Choice Model Using Individual Grouping Based on Cluster Analysis. Procedia Engineering 137:786-795

DPR (2003) Detailed Project Report Bangalore Metro (Phase I), Delhi Metro Rail Corporation Limited.

Goel, Tiwari (2014) Promoting Low Carbon Transport in India, Case study of metro rails in Indian cities. Proceeding of START-2005 Conference, IIT Kharagpur, India.

Hamre, Andrea, Buehler, et al (2014) Commuter Mode Choice and Free Car Parking, Public Transportation Benefits, Showers/Lockers, and Bike Parking at Work: Evidence from the Washington, DC Region. Journal of Public Transportation 17(2):67-91.

Jain S, Aggarwal P, Kumar P, et al (2014) Identifying public preferences using multi-criteria decision making for assessing the shift of urban commuters from private to public transport: A case study of Delhi.Transportation Research Part F: Traffic Psychology and Behaviour, vol 24:60-70.

Kashyap M (2011) Air Pollution from Transportation Sources in Bangalore – Call to Action Report, CiSTUP

Kumar A (2015) A Systems Approach To Assess And Improve The Last-Mile Access To Mass Transits. Thesis submitted to National University of Singapore.

KSPCB (2016a) Annual Air Quality Index of Bengaluru for the year 2015-16 www.knic.gov.in/ambient_air_quality_html. Accessed on 20 December 2017

KSPCB (2016b) Significant dip in air pollution after Metro launch: KSPCB study https://www.nyoooz.com/news/Bengaluru/482568/significant-dip-air-pollution-after-launch-kspcb-study. Accessed on 15 May 2017

KSPCB (2017) Air quality along Metro lines jumps 9-13%: Study https://timesofindia.indiatimes.com/city/Bengaluru/air-quality-along-metro-lines-jumps-9-13-study/articleshow/61651836. Accessed on 23 December 2017

Map Unity (2017) https://www.mapsofindia.com/bangalore/bangalore-metro-map.html. Accessed on 28 September, 2017

Mohan D (2008) Mythologies, Metro Rail Systems and Future Urban, Transport Economic and Political Weekly 16:25-29

Montgomery DC (1997) Design and Analysis of Experiments, 4th Ed, Wiley, New York

Prasertsubpakij D, Nitivattananon V (2012) Evaluating accessibility to Bangkok Metro Systems using multi-dimensional criteria across user groups. IATSS Research 36:56-65.

Randhawa P (2012) Delhi metro Rail - Beyond Mass Transit, Economic and Political Weekly vol XLVII, 16:25-29

Sharma S, Gangopadhyay , Dhyani R (2010) Methodology for estimation of CO_2 reduction from mass rapid transit system (MRTS) Projects, Journal of Scientific & Industrial Research, 69:586-593

SoER India (2001) Air Pollution with special reference to vehicular pollution in urban cities http://envfor.nic.in/soer/2001/ind_air.pdf. Accessed on 27 April 2017

Tangphaisankun A, Nakamura F, Okamura T (2009) Influences of Paratransit as A feeder of mass transit system in developing countries based on commuter satisfaction, Proceedings of the Eastern Asia Society for Transportation Studies vol 7, 2009

Tangphaisankun A, Okamura T, Nakamura F, Wang R (2010) A Study in Integrating Paratransit as A Feeder System into Urban Transportation and Its Effects on Mode Choice Behavior: A Study in Bangkok, Thailand. Paper presented at 12th WCTR, Lisbon, Portugal, 11-15 July 2010

Zhu, Liu (2004) Analysis of the impact of the MRT system on accessibility in Singapore using an integrated GIS tool. Journal of Transport Geography 12:89-101

10.   PHOTOGALLERY

Pollsters from EMPRI conducting the survey at E-W corridor of the metro rail

Environmental Management & Policy Research Institute (EMPRI)
Doresanipalya Forest Campus, J.P.Nagar 5ᵗʰ Phase, Bengaluru

Metro Rail commuters opinion survey

Name of the Metro Station: _____

Date and Time of Survey: _____

Commuter pathway: From _____ **to** _____

Surveyed By: _____

1. **Age of the Respondent:**
   Under 25 ☐ 25 to 35 ☐ 35 to 45 ☐ 45 to 55 ☐ 55 to 65 ☐ > 66 ☐
2. **Gender of Respondents:**
   Male ☐ Female ☐
3. **Education of the Respondent:**
   Below Bachelor's Degree ☐ Above Bachelor's Degree ☐
4. **Physical disability of the Respondent**
   Blind ☐ Deaf ☐ Dumb ☐ Orthopedically challenged ☐ None ☐
5. **Occupation of the Respondent:**
   Government service ☐ Private service ☐ Professionals ☐
   Business ☐ Student ☐ Household ☐ Retired personnel ☐ Others
6. **Annual Income of the Respondent:**
   Rs.10,000 to Rs.50,000 ☐ 5,01,000 to 10,00,000 ☐
   Rs.51,000 to Rs.1,00,000 ☐ Rs.1,01,000 to 5,00,000 ☐
   Greater than 10,00,000 ☐ Unemployed ☐
7. **What is the mode of transport you take to reach from home to Metro Station?**
   Bus ☐ Car ☐ Taxi ☐ Cycle ☐ Auto rickshaw ☐ Walk ☐
   Two-wheeler ☐
8. **What is the time taken for the travel?**

   _____
9. **What is the mode of transport you take to reach from Metro Station to home?**
   Bus ☐ Car ☐ Taxi ☐ Cycle ☐ Auto rickshaw ☐ Walk ☐
   Two-wheeler ☐
10. **What is the time taken for the travel?**

    _____

11. Frequency in using metro rail

Daily ☐   Weekly ☐   Once a fortnight ☐   Once a month ☐
Occasionally ☐

12. Has metro rail helped you in reducing your travelling time?

Yes ☐ No ☐

13. Has there been reduction in travel cost?

Yes ☐   No ☐

If yes, by how much per trip? _____

14. Which means of transport do you prioritize?

Bus ☐   Auto rickshaw ☐   Metro rail ☐   Private vehicle ☐ Cab ☐

15. Which means of public transportation is convenient to you?

Bus ☐   Metro rail ☐   Train ☐

16. Is metro rail a safe means of public transportation?

Yes ☐   No ☐

17. If yes, through which of these aspects?

Accident ☐   Vehicle theft ☐   Fire ☐

18. Which aspect of metro rail needs improvement?

Connectivity ☐   Parking ☐ Frequency ☐   Travel cost ☐ Ticketing ☐

19. Does the vehicle parking facility at the metro station cater to your parking needs?

Yes ☐   No ☐

20. Has metro rail caused considerable reduction in vehicular density of Bengaluru city?

Partially ☐   Moderately ☐ Completely ☐

21. Have the pollution levels come down after introduction of metro rail?

Partially ☐ Moderately ☐   Completely ☐

22. Is there any improvement in air quality you breathe after commuting in Metro?

Partially ☐   Moderately ☐   Completely ☐

23. Do you think your travel in Metro affects your health in any of these ways?

Headache ☐   Nausea ☐   Dizziness ☐ Sleepiness ☐ Allergy

24. By commuting in Metro, do you think there has been significant reduction in sound levels?

Yes ☐   No ☐

25. Do you see any improvements in the flow of traffic after introduction of Metro rail?

Partially ☐ Moderately ☐ Completely ☐

26. State one significant factor that has been observed during your travel in metro as compared to your past mode of transport.

Time ☐ Convenience ☐ Comfort ☐ Ambience ☐

27. Any suggestion you would like to give in the context of metro rail.

_____

_____

28. Do you have any suggestions for last mile connectivity with respect to Metro rail?

_____

_____

Metro station wise operational BMTC Bus route numbers

Sl.no	Metro Station	BMTC bus stops within 500m	Bus route numbers	no of destinations
1	Baiyappanahalli	Baiyappanahalli Metro Bus Stop / Srinivasapura	304B, 304D, 304J, 304P, 304V, 304R, 305, 305B, 305H, 305F, 305K, 305N, 306, 306E, 306J, 306G, 306L, 306MA, 306Q, 308, 307B, 311E, 311K, 312A, 313K, 315E, 315J, 316G, 316D, 316A, 316K, 316M, 304E, 304H, 304N, 304Q, 304S, 304Z, 305A, 305D, 305G, 305J, 305L, 305S, 306D, 306T, 306H, 306K, 306M, 306P, 306F, 307C, 308B, 310, 311J, 312, 313A, 313G, 315, 315F, 316, 316B, 316E, 316J, 316L, 316N, 316Q, 317C, 381A, 317J, 317M, 317N, 317S, 317Q, 317T, 317TD, 317W, 317YA, 317YE, 318, 319B, 319J, 324E, 320E, 321, 321D, 321G, 322C, 320A, 317E, 381J, 382C, 382A, 382M, 383A, 383C, G-12, 316R, 317D, 317G, 317K, 317MA, 317P, 317R, 317SA, 317TA, 317V, 317Y, 317YB, 317Z, 319, 319G, 320, 320H, 321C, 321E, 322A, 322M, 381, 381D, 381G, 382, 382B, 383, 383B, 383D, KBS-12HK, SBS-13K, V-319CT, 304, 304C, 304M, 304T, 304X, 305M, 305P, 305Q, 305R, 305V, 306A, 306C, 306B, 320C, 319F, 319K, 320B, 307, 308A, 316C, 316F, 316T, 316U, 316V, 317B, 318E, 380G, 380B, 380BA, 380C, 380E, 380F, 380, 380N, 380Q, 381E, 381H, 381K, 382D, MF-1, VMF-1B, VMF-10, V-MF-11, 310E, 319C, KBS-13K, 313B, 315V, V-317A, MKT-12HK, 310A, 310B, 311, 311C, 311F, 309, 304NA, 310C, 319E.	188
		Baiyappanahalli Back Gate	313F, 313L, 313P, 313T, 315D, 315DN, 315L, 315T, 400A, MF-3, MF-8, 313J, 315P.	13
2	Swami vivekananda	Swami Vivekananda Metro Bus Stop / Sadananda Nagara	304B, 304D, 304J, 304P, 304V, 304R, 305, 305B, 305H, 305F, 305K, 305N, 306, 306E, 306J, 306G, 306L, 306MA, 306Q, 308, 307B, 311E, 311K, 312A, 313K, 315E, 315J, 316G, 316D, 316A, 316K, 316M, 304E, 304H, 304N, 304Q, 304S, 304Z, 305A, 305D, 305G, 305J, 305L, 305S, 306D, 306T, 306H, 306K, 306M, 306P, 306F, 307C, 308B, 310, 311J, 312, 313A, 313G, 315, 315F, 316, 316B, 316E, 316J, 316L, 316N, 316Q, 317C, 381A, 317J, 317M, 317N, 317S, 317Q, 317T, 317TD, 317W, 317YA, 317YE, 318, 319B, 319J, 324E, 320E, 321, 321D, 321G, 322C, 320A, 317E, 381J, 382C, 382A, 382M, 383A, 383C, G-12, 316R, 317D, 317G, 317K, 317MA, 317P, 317R, 317SA, 317TA, 317V, 317Y, 317YB, 317Z, 319, 319G, 320, 320H, 321C, 321E, 322A, 322M, 381, 381D, 381G, 382, 382B, 383, 383B, 383D, KBS-12HK, SBS-13K, V-319CT, 304, 304C, 304M, 304T, 304X, 305M, 305P, 305Q, 305R, 305V, 306A, 306C, 306B, 320C, 319F, 319K, 320B, 307, 308A, 316C, 316F, 316T, 316U, 316V, 317B, 318E, 380G, 380B, 380BA, 380C, 380E, 380F, 380, 380N, 380Q, 381E, 381H, 381K, 382D, MF-1, VMF-1B, VMF-10, V-MF-11, 310E, 319C, KBS-13K, 313B, 315V, V-317A, MKT-12HK, 310A, 310B, 311, 311C, 311F, 309, 304NA, 310C, 319E, 313F, 313L, 313P, 313T, 315D, 315DN, 315L, 315T, 400A, MF-3, MF-8, 313J, 315P.	201
3	Indiranagar	CMH Double Road	138, 138-A, 138-D, 190, 314-D, 314-B, 314-E, 314-F, 314-FA, 314-G, 314-H, 314-T, 314-X, 139, 197, 314, 314-A, 314-N, 314-P, 201-G, 201-J, 201-MA, V-201R, 201-RB, 201-Q, 314-M, V-505A,	27
		Indiranagar KFC 100 feet road	412, MBS-8, MBS-8E, MF-5, MF-6, 201-D,	6
		Indiranagar Police Station/ Indiranagar KFC (Towards Domlur)	131, 137, 201, 201-K, 201-L, 201-N, 201-S, K-1, 412, MBS-8, MBS-8E, MF-5, MF-6, 201-D, 201-G, 201-J, 201-MA, V-201R, 201-RB, 201-Q, 314-M, V-505A.	22
		Indiranagar KFC (Towards Chinmaya Road)	201-G, 201-J, 201-MA, V-201R, 201-RB, 201-Q, 314-M, V-505A, 138, 138-A, 138-D, 190, 314-D, 314-B, 314-E, 314-F, 314-FA, 314-G, 314-H, 314-T, 314-X, 139, 197, 314, 314-A, 314-N, 314-P.	27
4	Halasuru	Halsuru Metro Stop /Adarsha Bus Stop	304B, 304D, 304J, 304P, 304V, 304R, 305, 305B, 305H, 305F, 305K, 305N, 306, 306E, 306J, 306G, 306L, 306MA, 306Q, 308, 307B, 311E, 311K, 312A, 313K, 315E, 315J, 316G, 316D, 316A, 316K, 316M, 304E, 304H, 304N, 304Q, 304S, 304Z, 305A, 305D, 305G, 305J, 305L, 305S, 306D, 306T, 306H, 306K, 306M, 306P, 306F, 307C, 308B, 310, 311J, 312, 313A, 313G, 315, 315F, 316, 316B, 316E, 316J, 316L, 316N, 316Q, 317C, 381A, 317J, 317M, 317N, 317S, 317Q, 317T, 317TD, 317W, 317YA, 317YE, 318, 319B, 319J, 324E, 320E, 321, 321D, 321G, 322C, 320A, 317E, 381J, 382C, 382A, 382M, 383A, 383C, G-12, 316R, 317D, 317G, 317K, 317MA, 317P, 317R, 317SA, 317TA, 317V, 317Y, 317YB, 317Z, 319, 319G, 320, 320H, 321C, 321E, 322A, 322M, 381, 381D, 381G, 382, 382B, 383, 383B, 383D, KBS-12HK, SBS-13K, V-319CT, 304, 304C, 304M, 304T, 304X, 305M, 305P, 305Q, 305R, 305V, 306A, 306C, 306B, 320C, 319F, 319K, 320B, 307, 308A, 316C, 316F, 316T, 316U, 316V, 317B, 318E, 380G, 380B, 380BA, 380C, 380E, 380F, 380, 380N, 380Q, 381E, 381H, 381K, 382D, 310E, 319C, KBS-13K, 313B, 315V, V-317A, MKT-12HK, 310A, 310B, 311, 311C, 311F, 309, 304NA, 310C, 319E, 313F, 313L, 313P, 313T, 315D, 315DN, 315L, 315T, 313J, 315P.	194
		CMH Road Lakshmipura	131, 138, 138-A, 138-D, 190, 201, 201-B, 201-K, 201-L, 201-N, 201-S, 314-D, 314-B, 314-E, 314-F, 314-FA, 314-G, 314-H, 314-T, 314-X, 314-C.	30
5	Trinity circle	Manipal Center	K-1	1
		Begum Mall	301F, 304D, 304S, 305K, 306Q, 310, 310E, 311, 311E, 311J, 311K, 312, 312A, 317G, 320, 320E, 320H, 321E, 380, SBS-1K.	20
		Lido Mall	304B, 304D, 304J, 304P, 304V, 304R, 305, 305B, 305H, 305F, 305K, 305N, 306, 306E, 306J, 306G, 306L, 306MA, 306Q, 308, 307B, 311E, 311K, 312A, 313K, 315E, 315J, 316G, 316D, 316A, 316K, 316M, 304E, 304H, 304N, 304Q, 304S, 304Z, 305A, 305D, 305G, 305J, 305L, 305S, 306D, 306T, 306H, 306K, 306M, 306P, 306F, 307C, 308B, 310, 311J, 312, 313A, 313G, 315, 315F, 316, 316B, 316E, 316J, 316L, 316N, 316Q, 317C, 381A, 317J, 317M, 317N, 317S, 317Q, 317T, 317TD, 317W, 317YA, 317YE, 318, 319B, 319J, 324E, 320E, 321, 321D, 321G, 322C, 320A, 317E, 381J, 382C, 382A, 382M, 383A, 383C, G-12, 316R, 317D, 317G, 317K, 317MA, 317P, 317R, 317SA, 317TA, 317V, 317Y, 317YB, 317Z, 319, 319G, 320, 320H, 321C, 321E, 322A, 322M, 381, 381D, 381G, 382, 382B, 383, 383B, 383D, KBS-12HK, SBS-13K, V-319CT, 304, 304C, 304M, 304T, 304X, 305M, 305P, 305Q, 305R, 305V, 306A, 306C, 306B, 320C, 319F, 319K, 320B, 307, 308A, 316C, 316F, 316T, 316U, 316V, 317B, 318E, 380G, 380B, 380BA, 380C, 380E, 380F, 380, 380N, 380Q, 381E, 381H, 381K, 382D, 310E, 319C, KBS-13K, 313B, 315V, V-317A, MKT-12HK, 310A, 310B, 311, 311C, 311F, 309, 304NA, 310C, 319E, 313F, 313L, 313P, 313T, 315D, 315DN, 315L, 315T, 313J, 315P, 131, 138, 138-A, 138-D, 190, 201, 201-B, 201-K, 201-L, 201-N, 201-S, 314-D, 314-B, 314-E, 314-F, 314-FA, 314-G, 314-H, 314-T, 314-X, 314-C.	224
		Airforce Office Trinity Circle	320C, 323J, 323L, 324A, 329D, 329G, 329J, 330, 330A, 330C, 330D, 330E, 330G, 330H, 330M, 330P, 330PG, 331, 331A, 334EA, MBS-2, SBS-1K, V-331A.	23
6	M G road	MG Road Metro Stop	KIAS-5B, KIAS-7, KIAS-7A, G-11.	4
		MG Road Back Station	127, 139, 169, 304D, 304S, 305H, 305K, 306Q, 310, 310E, 311, 311E, 311J, 311K, 312, 314, 314A, 314N, 314P, 317G, 320, 320B, 320C, 320E, 320H, 321E, 323L, 329D, 329G, 329J, 330, 330C, 330D, 330E, 330G, 330H, 330M, 330P, 330PG, 331, 331A, 334EA, 339A, 362, 362CA, 362K, G-11, G-8, G-9A, K-1,	50
		Mayohall	304B, 304D, 304J, 304P, 304V, 304R, 305, 305B, 305H, 305F, 305K, 305N, 306, 306E, 306J, 306G, 306L, 306MA, 306Q, 308, 307B, 311E, 311K, 312A, 313K, 315E, 315J, 316G, 316D, 316A, 316K, 316M, 304E, 304H, 304N, 304Q, 304S, 304Z, 305A, 305D, 305G, 305J, 305L, 305S, 306D, 306T, 306H, 306K, 306M, 306P, 306F, 307C, 308B, 310, 311J, 312, 313A, 313G, 315, 315F, 316, 316B, 316E, 316J, 316L, 316N, 316Q, 317C, 381A, 317J, 317M, 317N, 317S, 317Q, 317T, 317TD, 317W, 317YA, 317YE, 318, 319B, 319J, 324E, 320E, 321, 321D, 321G, 322C, 320A, 317E, 381J, 382C, 382A, 382M, 383A, 383C, G-12, 316R, 317D, 317G, 317K, 317MA, 317P, 317R, 317SA, 317TA, 317Y, 317YB, 317Z, 319, 319G, 320, 320H, 321C, 321E, 322A, 322M, 381, 381D, 381G, 382, 382B, 383, 383B, 383D, KBS-12HK, SBS-13K, V-319CT, 304, 304C, 304M, 304T, 304X, 305M, 305P, 305Q, 305V, 306A, 306C, 306B, 320C, 319F, 319K, 320B, 307, 308A, 316C, 316F, 316T, 316U, 316V, 317B, 318E, 380G, 380B, 380BA, 380C, 380E, 380F, 380, 380N, 380Q, 381E, 381H, 381K, 382D, 310E, 319C, KBS-13K, 313B, 315V, V-317A, MKT-12HK, 310A, 310B, 311, 311C, 311F, 309, 304NA, 310C, 319E, 313F, 313L, 313P, 313T, 315D, 315DN, 315L, 315T, 313J, 315P, 131, 138, 138-A, 138-D, 190, 201, 201-B, 201-K, 201-L, 201-N, 201-S, 314-D, 314-B, 314-E, 314-F, 314-FA, 314-G, 314-H, 314-T, 314-X, 314-C, 320C, 323J, 323L, 324A, 329D, 329G, 329J, 330, 330A, 330C, 330D, 330E, 330G, 330H, 330M, 330P, 330PG, 331, 331A, 334EA, SBS-1K, V-331A.	246
		Brigade Road	G-3, G4.	2
7	Cubbon park	Balakundri circle	15-K, 32-E, 34, 34-A, 34-B, 34-F, 37, 37-B, 37-E, 210-H, TR-7, 13, 13-A, 13-B, 13-C, 13-D, 13-E, 13-F, 13-H, 13-J, 13-K, 13-S, 13-Q, 20, 27, 27-A, 27-E, 182, 210-FA, 210-G, 210-Q, 214-A, 215-U, 217-E, 290-P, K-6, 129, 195, V-195, 237-C, 238-D, 238-UA, 238-Z, 241-Q, 242-JA, 243-H, 245-N, 245-R, 246-A, 121-BA, 150, 154, 155, 222-K, 223-P, 226-G, 239-B, 234-F, 242-JA, 290-EB, 290-HA, 290-KA, 290-N, 290-R, 290-RA, 290-T, 291, 291-A, 291-J, 291-N, 291-R, 292, 293, 293-A, 293-B, 293-C, 293-D, 293-E, 293-F, 293-J, 293-L, 293-M, 294, 294-A, 294-D, 295, 300-A, TR-4, TR-4A, 63, 63-B, 63-C, 63-E, 66, 68, 74, 79-A, 79-B, 79-D, 79-E, 79-F, 79-G, 79-J, 79-K, 94-C, 95, 95-C, 95-G, 169, 161-B, 161-D, 166, 342-R, 348-D.	114
		Indian Express	122, 290-B, 290-D, 290-EY, 290-J, 291-H, 291-M, 292-B, 292-C, 292-E, 293-H, 293-S, 294-B, 294-E, 294-F, 295-A, 295-E, 296-A, 296-B, 296-C, 296-F, 296-N, 296-T, 296-V, 300-A, 300-B, 300-C, 300-H, 301, 301-F, 302-A, 302-B, 302-C, 302-D, 302-E, 302-F, 302-N, 303, 303-A, 303-E, 50, 119-B, 121-A, 126-A, 301-A,	45
		Indian Express (Towads Cunnigum Road)	122, 290-B, 290-D, 290-EY, 290-J, 291-H, 291-M, 292-B, 292-C, 292-E, 293-H, 293-S, 294-B, 294-E, 294-F, 295-A, 295-E, 296-A, 296-B, 296-C, 296-F, 296-N, 296-T, 296-V, 300-A, 300-B, 300-C, 300-H, 301, 301-F, 302-A, 302-B, 302-C, 302-D, 302-E, 302-F, 302-N, 303, 303-A, 303-E, 50, 119-B, 121-A, 126-A, 129, 195, V-195, 196, 210-H, 214-A, 222-K, 223-A, 223-P, 226-G, 237-C, 238-D, 238-UA, 238-Z, 239-B, 240-A, 241-Q, 241-S, 243-H, 245-N, 245-R, 301-A,	66
8	Dr.B.R Ambedkar vidhansoudha	Vidhanasoudha bus stop	111, 114, 126A, 291H, 292C, 293H, 293S, 296B, 296F, 302B, 126, 290EY, 108, 114G, 301, 301A, G-10, 122, 290B, 290D, 290J, 291M, 292B, 292E, 294B, 294E, 294F, 295A, 295E, 296A, 296C, 296N, 296T, 296V, 300B, 300C, 300H, 301F, 302A, 302N, 303, 303A, 119B, 129, 302F, 111E, 50, 210H, 121A, 114E.	45
		Telephone Exchange	111, 114, 108, 114G, 121A	5

10	City railway station	Hunsemara 1st Cross	240BA, 240C, 240E, 240F, 240G, 240J, 240K, 240M, 240N, 241, 241C, 241CD, 241G, 241M, 241N, 242, 242F, 242FA, 242G, 242JK, 242L, 242LA, 242M, 242MA, 242N, 242P, 242Q, 242R, 242RA, 242T, 242TA, 242TB, 242TC, 242V, 242U, 242VA, 242Y, 242ZB, 242ZC, 243, 243A, 243B, 243C, 243G, 243M, 244A, 245, 245A, 245C, 245D, 245DA, 245E, 245H, 247, 251E, 267, 60B, 60C, 77, 77A, 77B, 77C, 77D, 77E, 77F, TR-12, TR-12A, 181	68
		Magadi Road 1st Cross	223P, 223PA, 234C, 235B, 235D, 235k, 235P, 235Q, 238, 238A, 238AB, 238B, 238C, 238L, 238U, 238UA, 238UB, 238UC, 238V, 238VA, 238VR, 238W, 238Z, 238ZA, 240A, 240D, 240H, 240R, 241B, 241CB, 241E, 241H, 241P, 241Q, 242B, 242BA, 242CB, 242FB, 242GA, 242JA, 242X, 242Z, 242ZD, 243D, 243F, 243H, 243J, 243L, 245GA, 245J, 245K, 245M, 245MA, 245N, 245Q, 245R, 246, 265, 265A, 265B, 265D, 265E, 265J, 61, 61G, 61M, 66, 87, 87B, 87A, 87C, 87S, MBS-12	73
11	Magadi road	10th cross magadi road	240BA, 240C, 240E, 240F, 240G, 240J, 240K, 240M, 240N, 241, 241C, 241CD, 241G, 241M, 241N, 242, 242F, 242FA, 242G, 242JK, 242L, 242LA, 242M, 242MA, 242N, 242P, 242Q, 242R, 242RA, 242T, 242TA, 242TB, 242TC, 242V, 242U, 242VA, 242Y, 242ZB, 242ZC, 243, 243A, 243B, 243C, 243G, 243M, 244A, 245, 245A, 245C, 245D, 245DA, 245E, 245H, 247, 267, 60B, 60C, 77, 77A, 77B, 77C, 77D, 77E, 77F, TR-12, TR-12A, 181, 223P, 223PA, 234C, 235B, 235D, 235k, 235P, 235Q, 238, 238A, 238AB, 238B, 238C, 238L, 238U, 238UA, 238UB, 238UC, 238V, 238VA, 238VR, 238W, 238Z, 238ZA, 240A, 240D, 240H, 240R, 241B, 241CB, 241E, 241H, 241P, 241Q, 242B, 242BA, 242CB, 242FB, 242GA, 242JA, 242X, 242Z, 242ZD, 243D, 243F, 243H, 243J, 243L, 245GA, 245J, 245K, 245M, 245MA, 245N, 245Q, 245R, 246, 265, 265A, 265B, 265D, 265E, 265J, 61, 61g, 61m, 66, 87, 87B, 87A, 87C, 87S, MBS-12	141
		Prasanna(towards rajaji nagar)	176, 176C, 176CA, 176E, 176G, 181, 195, 196, 225CF, 235, 235F, 238D, 238F, 240DA, 244F, 244C, 244H, 300V, 333L, 335N, 335R, 414, 61A, 61C, 61E, 61F, 61J, 63, 63B, 63E, 75B, 75D, 75E, 75F, 75H, 77, 77A, 77B, 77C, 77D, 77E, 77F, G7, TR-12, TR-12A, V-195, V-333T, V-61F	48
		Prasanna(towards vijay nagar)	176, 176C, 176CA, 176E, 176G, 195, 196, 223P, 223PA, 225CF, 234C, 235, 235B, 235D, 235F, 235k, 235P, 235Q, 238, 238A, 238AB, 238B, 238C, 238D, 238F, 238L, 238U, 238UA, 238UB, 238UC, 238V, 238VA, 238VR, 238W, 238Z, 238ZA, 300V, 333L, 335N, 335R, 335SA, 414, 60B, 60C, 61, 61A, 61C, 61E, 61F, 61g, 61J, 61m, 63, 63B, 63E, 75B, 75D, 75E, 75F, 75H, V-195, V-333T, V-61F, 87, 87A, 87B, 87C, 87S	68
12	Hosahalli	Tollgate (Towards Dasarahalli)	240A, 240BA, 240C, 240D, 240DA, 240E, 240F, 240G, 240H, 240J, 240K, 240M, 240N, 240R, 241, 241B, 241C, 241CB, 241CD, 241E, 241G, 241H, 241M, 241N, 241P, 241Q, 242, 242B, 242BA, 242CB, 242F, 242FA,242FB, 242G, 242GA, 242JA, 242JK, 242L, 242LA, 242M, 242MA, 242N, 242P, 242Q, 242R, 242RA, 242T, 242TA, 242TB, 242TC, 242U, 242V, 242VA, 242X, 242Y, 242Z, 242ZB, 242ZC, 242ZD, 243, 243A, 243B, 243C, 243D, 243F, 243G, 243H, 243J, 243L, 244A, 244C, 244F, 244H, 245, 245A, 245C, 245D, 245DA, 245E, 245GA, 245H, 245J, 245K, 245M, 245MA, 245N, 245Q, 245R, 246, 247, 265, 265A, 265B, 265D, 265E, 265J, 267, 66, G7, MBS-12	101
		Tollgate (Towards vijaynagar)	176, 176C, 176CA, 176E, 176G, 195, 196, 223P, 223PA, 225CF, 234C, 235, 235B, 235D, 235F, 235k, 235P, 235Q, 238, 238A, 238AB, 238B, 238C, 238D, 238F, 238L, 238U, 238UA, 238UB, 238UC, 238V, 238VA, 238VR, 238W, 238Z, 238ZA, 300V, 333L, 335N, 335R, 335SA, 414, 60B,60C, 61, 61A, 61C, 61E, 61F, 61g, 61J, 61m, 63, 63B, 63E, 75B, 75D, 75E, 75F, 75H, V-195, V-333T, V-61F, 87, 87A, 87B, 87C, 87S	68
		Tollgate (Towards WOC)	64, 235J, 401B, 401BA, 401E, 401K, 401KA, 401KB, 401KC, 401N, 401Q, 401R, 401RA, 401RB, 401RC, 401RH, 401SA, V-500KB	18
		Manuvana	176, 176C, 176CA, 176E, 176G, 195, 196, 223P, 223PA, 225CF, 234C, 235, 235B, 235D, 235F, 235J, 235k, 235P, 235Q, 238, 238A, 238AB, 238B, 238C, 238D, 238F, 238L, 238SA, 238U, 238UB, 238UA, 238UC, 238V, 238VA, 238VR, 238W, 238Z, 238ZA, 240P, 248, 248AN, 248BA, 248B, 248BB, 248C, 248F, 248L, 248M, 248N, 248P, 248PS, 248R, 248T, 248V, 248Y, 248Z, 300V, 333L, 335N, 335R, 335SA, 401B, 401BA, 401E, 401K, 401KA, 401KB, 401KC, 401N, 401Q, 401R, 401RA, 401RB, 401RC, 401RH, 401SA, 410, 410A, 410D, 410G, 410J, 414, 60B, 60C, 60F, 60H, 61, 61A, 61C, 61E, 61F, 61g, 61J, 61m, 63, 63B, 63E, 64, 65B, 75B, 75D, 75E, 75F, 75H, 87, 87A, 87B, 87C, 87S, K-2, K-3, KIAS-10, V-195, V-333T, V-500KB, V-61F	116
		M.C.layout	60H, 60F, 410, 410G, 410A, 248B, 65B, 248BA, 248AN, 248, 238SA, 248BB, 248C, 248F, 248L, 248M, 248N, 248P, 248PS, 248R, 248T, 248V, 248Y, 248Z, K-2, KIAS-10, 410D, 240P, K-3, 410J	30
		Binny layout, J.P.Park	87, 87A, 87B, 87C, 87S	5
13	Vijaynagar	Vijaynagar	121BA, 176, 176C, 176CA, 176E, 176G, 195, 223P, 225CF, 235A, 235AA, 235H, 235J, 235M, 237, 237J, 238A, 238AB, 238D, 238L, 238S, 238SA, 238V, 238VA, 238VR, 238Z, 240P, 248, 248AN, 248B, 248BA, 248BB, 248C, 248F, 248L, 248M, 248N, 248P, 248PS, 248R, 248T, 248V, 248Y, 248Z, 300V, 333L, 335N, 335R, 335SA, 401B, 401BA, 401E, 401N, 401Q, 401R, 401RA, 401RB, 401RC, 401RH, 401SA, 410, 410D, 410G, 410J, 414, 59A, 600KA, 60B, 60C, 60F, 60H, 61, 61A, 61C, 61E, 61F, 61g, 61J, 63 61m, 63B, 63E, 64, 65B, 75B, 75D, 75E, 75H, K-2, K-3, KIAS-10, MF-12, MF-13, MF-14, MF-16, V-195, V-333T, V-500K, V-500KB, V-61F	101
		Vijaynagar Water Tank	235F, 235, 238F, 196, 75F, 401K, 401KA, 401KB, 401KC, 235A, 235AA, 235M, 237, 59A, 238UA, 235Q, 238, 238C, 238U, 238UB, 238UC, 238ZA, 235B, 238W, 235D, 235k, 235P, 223PA, 234C, 235H, 237J, 238S, MF-13, MF-13A, 238B	35
		Maruthi Mandir	121BA, 176, 176C, 176CA, 176E, 176G, 195, 223P, 225CF, 235A, 235AA, 235H, 235J, 235M, 237, 237J, 238A, 238AB, 238D, 238L, 238S, 238SA, 238V, 238VA, 238VR, 238Z, 240P, 248, 248AN, 248B, 248BA, 248BB, 248C, 248F, 248L, 248M, 248N, 248P, 248PS, 248R, 248T, 248V, 248Y, 248Z, 300V, 333L, 335N, 335R, 335SA, 401B, 401BA, 401E, 401N, 401Q, 401R, 401RA, 401RB, 401RC, 401RH, 401SA, 410, 410A, 410D, 410G, 410J, 414, 59A, 600KA, 60B, 60C, 60F, 60H, 61, 61A, 61C, 61E, 61F, 61g, 61J, 63 61m, 63B, 63E, 64, 65B, 75B, 75D, 75E, 75H, K-2, K-3, KIAS-10, MF-12, MF-13, MF-13A, MF-16, V-195, V-333T, V-500K, V-500KB, V-61F, 59B	102
14	Attiguppe	Vijaynagar TTMC	121BA, 176C, 176CA, 176E, 195, 201M, 223P, 225CF, 235A, 235AA, 235H, 235J, 235M, 237, 237J, 238A, 238AB, 238D, 238L, 238S, 238SA, 238V, 238VA, 238VR, 238Z, 240P, 248, 248AN, 248B, 248BA, 248BB, 248C, 248F, 248L, 248M, 248N, 248P, 248PS, 248R, 248T, 248V, 248Y, 248Z, 333L, 335N, 335R, 335SA, 401B, 401BA, 401E, 401Q, 401R, 401RA, 401RC, 401RH, 401SA, 410, 410A, 410D, 410G, 410J, 414, 59, 59A, 59B, 59C, 600FD, 600KA, 600KB, 600KD, 60A, 60B, 60C, 60E, 60F, 60H, 60J, 60L, 61, 61A, 61C, 61E, 61F, 61g, 61J, 61m, 63, 63B, 65B, 75D, 75E, 75H, 87B, CS-60A, JPV-60A, K-2, K-3, KIAS-10, MF-12, MF-13, MF-13A, MF-16, MP-60A, NICE-4, V-195, V-333T, V-500K, V-500KB, V-600KB, V-600NL, V-61F	111
		Subbanna Garden	61F, 63B, V-61F, 75E, 60J, 59C	6
		Hampinagara	176, 176G, 63E, 300V, 75B, 64, 401B, 401N, 248B, 201M, 87A, 87C, 87, 87S	14
		R.P.C Layout 7th Main	176, 176G, 63E, 300V, 75B, 64, 401B, 401N, 201M, 87A, 87C, 87, 87S	13
		Income Tax Layout	176C, 176CA, 195, 223P, 238A, 238AB, 238D, 238L, 238V, 238VA, 238VR, 238Z, 333L, 335N, 335R, 401E, 59D, 59F, 60B, 60C, 61A, 61C, 61g, 61J, 75D, 61m, 87B, K-4, MF-13, MF-13A, V-195, V-333T	32
		Attiguppe	121BA, 176E, 201M, 225CF, 235A, 235AA, 235H, 235J, 235M, 237, 237J, 238S, 238SA, 240P, 248, 248AN, 248B, 248BA, 248BB, 248C, 248F, 248L, 248M, 248N, 248P, 248PS, 248R, 248T, 248V, 248Y, 248Z, 335SA, 401B, 401Q, 401R, 401RA, 401RB, 401RC, 401RH, 401SA, 410, 410A, 410D, 410G, 410J, 414, 59, 59A, 59B, 59C, 59D, 59F, 600FD, 600KA, 600KB, 600KD, 60E, 60A, 60F, 60H, 60J, 60L, 63, 65B, 75H, CS-60A, JPV-60A, K-2, K-3, K-4, KIAS-10, MF-12, MF-16, MP-60A, NICE-4, V-500K, V-500KB, V-600KB, V-600NL	79
16	Deepanjali nagar	Deepanjali nagar / KAVIKA Layout	121BA, 201M, 225CF, 235A, 235AA, 235H, 235J, 235M, 237, 237J, 238S, 238SA, 240P, 248, 248AN, 248BA, 248BB, 248C, 248F, 248L, 248M, 248N, 248P, 248PS, 248R, 248T, 248V, 248Y, 248Z, 335SA, 401BA, 401Q, 401R, 401RA, 401RB, 401RC, 401RH, 401SA, 410, 410A, 410D, 410G, 410J, 414, 59, 59A, 59B, 59C, 59D, 59F, 59H, 600FD, 600KA, 600KB, 600KD, 60E, 60A, 60F, 60H, 60J, 60L, 65B, 75H, CS-60A, JPV-60A, K-2, K-3, K-4, KIAS-10, MF-12, MF-16, MP-60A, NICE-4, V-500K, V-500KB, V-600KB, V-600NL	77
		BHEL	121BA, 201M, 225CF, 235A, 235AA, 235H, 235J, 235M, 237, 237J, 238S, 238SA, 240P, 248, 248AN, 248BA, 248BB, 248C, 248F, 248L, 248M, 248N, 248P, 248PS, 248R, 248T, 248V, 248Y, 248Z, 335SA, 401BA, 401Q, 401R, 401RA, 401RB, 401RC, 401RH, 401SA, 410, 410A, 410D, 410G, 410J, 414, 59, 59A, 59B, 59C, 59D, 59F, 59H, 600FD, 600KA, 600KB, 600KD, 60E, 60A, 60F, 60H, 60J, 60L, 65B, 75H, CS-60A, JPV-60A, K-2, K-3, K-4, KIAS-10, MF-12, MF-16, MP-60A, NICE-4, V-500K, V-500KB, V-600KB, V-600NL	171
16	Mysore road	Mysore road metro station	121BA, 201M, 225CF, 235A, 235AA, 235H, 235J, 235M, 237, 237J, 238S, 238SA, 240P, 248, 248AN, 248BA, 248BB, 248C, 248F, 248L, 248M, 248N, 248P, 248PS, 248R, 248T, 248V, 248Y, 248Z, 335SA, 401BA, 401Q, 401R, 401RA, 401RB, 401RC, 401RH, 401SA, 410, 410A, 410D, 410G, 410J, 414, 59, 59A, 59B, 59C, 59D, 59F, 59H, 600FD, 600KA, 600KB, 600KD, 60E, 60A, 60F, 60H, 60J, 60L, 65B, 75H, CS-60A, JPV-60A, K-2, K-3, K-4, KIAS-10, MF-12, MF-16, MP-60A, NICE-4, V-500K, V-500KB, V-600KB, V-600NL	171
		Nayandahalli signal (Towards Rajkumar Samadhi)	MF-18, 410F, 410FB, 501BH	4
		Nayandahalli signal (Towards Banashankari)	201M, 223j, 401BA, 401SA, 410, 410A, 410D, 410F, 410FB, 410G, 410J, 501A, 501B, 501BH, 501GA, 502, 600, 600FD, 600KA, 600KB, 600KD, 601, CHAKRA-3, CHAKRA-3A, MBS-24, MF-12, MF-16, NICE-4, V-500K, V-500KB, V-500KE, V-600KB, V-600NL	33
		Gangondanahalli masjid road	87B, 59D	2

ANNEXURE - 3
Details of Bus routes West side (Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
1	60H	Shankararnag Bus Stop	Jayanagara 9th Block
2	MF-12	Vijaynagar	Banashankari TTMC
3	600KA	Vijaynagar	Electronic City 2nd Phase
4	61A	Kempegowda Bus Station	Chandra Layout
5	61J	Kempegowda Bus Station	Chandra Layout 1st Stage
6	61C	Kempegowda Bus Station	Chandra Layout
7	61F	Kempegowda Bus Station	GKW Layout
8	235F	Kempegowda Bus Station	Sports Authority of India
9	235	Kempegowda Bus Station	Ladies Hostel University Campus
10	240DA	Kempegowda Bus Station	Kottige Palya Magadi Road
11	244C	Kempegowda Bus Station	Nagarabhavi 9th Block
12	244F	Kempegowda Bus Station	D Group Employees Layout
13	244H	Kempegowda Bus Station	Nagarabhavi 2nd Phase 11th Block
14	G7	Kempegowda Bus Station	Janapriya Town Ship
15	75D	Chowdeshwari Bus Stand JP Park	Chandra Layout 1st Stage
16	176	Kaval Byrasandra	Hampinagara RPC Layout
17	176CA	Manorayana Palya	Chandra Layout
18	176E	Kaval Byrasandra	BCC Layout
19	238F	Malleshwaram 18th Cross	Nagarabhavi 1st Stage 3rd Block
20	63	Shivajinagar	BCC Layout
21	63B	Shivajinagar	GKW Layout
22	63E	Shivajinagar	Hampinagara RPC Layout
23	195	Shivajinagar	Chandra Layout
24	V-195	Shivajinagar	Chandra Layout
25	196	Shivajinagar	Saraswathi Nagara Vijayanagara
26	238D	Shivajinagar	Nagarabhavi 1st Stage 3rd Block
27	333L	Kadugodi	Chandra Layout
28	335R	Kadugodi	RTO Ullalu
29	V-333T	Kadugodi	Nagarabhavi BDA Complex
30	335N	Kadugodi	Kengeri Satelite Town
31	61E	Kempegowda Bus Station	vijaynagar ttmc
32	300V	Shampura	Hampinagara RPC Layout
33	225CF	Kempegowda Bus Station	BGS Hospital
34	V-61F	Kempegowda Bus Station	GKW Layout
35	75B	Malleshwaram 18th Cross	Hampinagara RPC Layout
36	75E	Malleshwaram 18th Cross	GKW Layout
37	75F	Yeshawanthapura TTMC	Saraswathi Nagara Vijayanagara
38	75H	Malleshwaram 18th Cross	Mysore Road Satellite Bus Stand
39	176C	Sulthan Palya	Chandra Layout
40	414	KNarayanapura	Mysore Road Satellite Bus Stand
41	176G	Ganga Nagara	Hampinagara RPC Layout
42	64	Shivajinagar	Hampinagara RPC Layout
43	401BA	Yelahanka	Chikkallasandra Bus Stand
44	401K	Yelahanka	Kengeri TTMC
45	401B	Yelahanka	Hampinagara RPC Layout
46	401E	Yelahanka	Chandra Layout
47	401KA	Yelahanka	Ramasandra
48	401KB	Yeshwanthpura	Kengeri TTMC
49	401KC	Devasandra	Kengeri TTMC
50	401N	Yelahanka	Hampinagara RPC Layout
51	401Q	Yelahanka	Mysore Road Satellite Bus Stand
52	401R	Yelahanka	BEML Layout 5th Stage
53	401RA	Yelahanka	Srinivasa Pura
54	401RB	Yelahanka	BHEL Layout
55	401RC	Devasandra Chikkamaranahalli	BEML Layout 5th Stage
56	401RH	Yelahanka	Globale Academy Bangarappa Nagara
57	401SA	Yeshwanthpura	Chikkallasandra Bus Stand
58	60F	Kamalanagar BEML layout	Chennamma kere Achukattu

ANNEXURE - 3
Details of Bus routes West side (Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
59	410	Jalahalli Cross	Bommanahalli
60	410G	Kottige Palya Magadi Road	Bannashankari TTMC
61	235J	Yeshwanthpura	Bharath House building Co-operative Society layout
62	410A	Jalahalli Cross	Attibele
63	V-500KB	Chowdeshwari Bus Stand JP Park	ITPL
64	60A	Vijaynagar TTMC	jayanagar 9th block
65	60E	Vijaynagar TTMC	BTM Layout
66	60J	GKW Layout	Koramangala
67	MP-60A	Vijaynagar TTMC	jayanagar 9th block
68	CS-60A	Vijaynagar TTMC	jayanagar 9th block
69	JPV-60A	Vijaynagar TTMC	jayanagar 9th block
70	60L	Vijaynagar TTMC	Jaibheemanagara
71	248B	Hampinagar RPC layout	chikkabanavara
72	201M	Hampinagar RPC layout	Jeevanbheemanagara
73	600FD	Vijaynagar TTMC	Attibele
74	600KD	Vijaynagar TTMC	Electronic City Wipro Gate
75	600KB	Vijaynagar TTMC	Electronic City 2nd phase
76	V-600KB	Vijaynagar TTMC	Electronic City Wipro Gate
77	V-600NL	Vijaynagar TTMC	Electronic City Wipro Gate
78	NICE-4	Vijaynagar TTMC	Electronic City Wipro Gate
79	235A	K.R. Market	Nagarabhavi Village
80	235AA	K.R. Market	Bangalore University ADM Block
81	235M	K.R. Market	Jnana Jyothi Nagara 2nd Phase
82	237	K.R. Market	Panchsheela Nagara
83	59	K.R. Market	vijaynagar TTMC
84	59A	K.R. Market	Saraswathi Nagara Vijayanagara
85	59B	K.R. Market	Marenahalli
86	59C	K.R. Market	GKW Layout
87	59D	K.R. Market	Nayandahalli Railway Gate
88	59H	K.R. Market	BCC Layout
89	65B	Banashankari TTMC	Basaveshwara Nagara
90	248BA	Mysore road satellite bus stand	Hesaraghatta village
91	248AN	K.R.Market	Nelamangala
92	248	K.R.Market	Jalahalli Cross
93	238SA	K.R. Market	Sunkadakatte
94	248BB	K.R. Market	Hesaraghatta village
95	248C	K.R.Market	Rajagopalanagar Rajni Farms
96	248F	K.R.Market	Karim Sab Layout
97	248L	K.R.Market	Sheshadri Nagara
98	248M	BEL Layout 5th stage	Thammenahalli Palya
99	248N	Mysore road satellite bus stand	Chikkabanavara
100	248P	Mysore road satellite bus stand	Thammenahalli
101	248PS	K.R.Market	Peenya Satellite Bus Station
102	248R	K.R.Market	Jalahalli Cross
103	248T	K.R. Market	Kirloskar Badavane
104	248V	K.R.Market	Shettty Halli
105	248Y	K.R.Market	Pillahalli
106	248Z	Mysore road satellite bus stand	Hesaraghatta village
107	121BA	Shivajinagar	Vijayanagara
108	K-4	Nagarabhavi BDA Complex	CV Raman nagara
109	K-2	Mysore road satellite bus stand	Hebbala
110	KIAS-10	Mysore road satellite bus stand	Kempegowda International Airport
111	501A	Banashankari TTMC	Hebbala
112	501BH	Banashankari TTMC	Hebbala Bridge
113	600	Banashankari TTMC	Banashankari TTMC
114	CHAKRA-3	Banashankari TTMC	Banashankari TTMC
115	410D	Bharathnagar 2nd phase	Electronic City
116	V-500K	Vijaynagar	ITPL

ANNEXURE - 3
Details of Bus routes West side (Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
117	V-500KE	Shirke	ITPL
118	502	Kengeri satellite town	Kadugodi
119	MBS-24	RR Temple	Kadugodi
120	CHAKRA-3A	Banashankari TTMC	Banashankari TTMC
121	601	Banashankari TTMC	Banashankari TTMC
122	501B	Hebbala	Hebbala Bridge
123	501GA	Kengeri TTMC	Agara
124	AS-6	Mysore road satellite bus stand	Ullalu Upanagara
125	223j	Doddabasti	Central Silk Board
126	MF-14	Mysore road satellite bus stand	BEML Layout 5th Stage
127	245MA	Kempegowda Bus Station	Kammasandra
128	245M	Kempegowda Bus Station	Vaddarahalli BMTC Training Centre
129	245K	Kempegowda Bus Station	Avarehalli
130	245J	Kempegowda Bus Station	Kittanahalli
131	242X	Kempegowda Bus Station	Dodderi Grama
132	242FB	Kempegowda Bus Station	Yelachaguppe
133	242BA	Kempegowda Bus Station	Tavarekere
134	242B	Kempegowda Bus Station	Tavare Kere Magadi Road
135	240E	K.R.Market	Bylakonenahalli
136	240C	K.R.Market	Kachohalli
137	240G	K.R.Market	Nagaraholenagara
138	241	K.R.Market	Kenchanapura
139	241C	K.R.Market	Yale Kodigehalli
140	241CD	K.R.Market	Chikka Kodigehalli
141	241G	K.R.Market	Seegehalli
142	241N	K.R.Market	Bramha Devara Gudda
143	241P	Shivajinagar	Kannalli
144	242	K.R.Market	Tavare Kere Magadi Road
145	242FA	K.R.Market	Gidada Palya
146	242F	K.R.Market	Yelachaguppe
147	242G	K.R.Market	Byadarahalli
148	242M	K.R.Market	Dodderi Grama
149	242RA	K.R.Market	Karikallu
150	242ZB	K.R.Market	Kallur
151	243	K.R.Market	Andhrahalli
152	243A	K.R.Market	Upkar Residency Layout ,Mallathhalli
153	243B	K.R.Market	Thigalara Palya
154	243C	K.R.Market	Thigalara Palya
155	245	K.R.Market	Ravuthanahalli
156	245DA	K.R.Market	Vaddarahalli BMTC Training Centre
157	245E	K.R.Market	Kittanahalli
158	242TC	K.R.Market	Nelamangala
159	242TB	K.R.Market	Kanuvanahalli
160	242TA	K.R.Market	Mantanakurchi
161	242T	K.R.Market	Hunnigere
162	242R	K.R.Market	Jogerahalli
163	242Q	K.R.Market	Gangena Halli
164	242MA	K.R.Market	Suliwara
165	242N	K.R.Market	Giddenahalli
166	242P	K.R.Market	Huluvenahalli
167	242U	K.R.Market	Lakshmipura
168	242VA	K.R.Market	Sugganahalli
169	242Y	K.R.Market	Aralimarada Palya
170	242ZC	K.R.Market	Kothaganahalli ,Motaganahalli
171	243M	K.R.Market	Sripathi Halli
172	245H	K.R.Market	Nelamangala
173	240K	K.R.Market	Biskur
174	240N	K.R.Market	Helige Halli Colony

ANNEXURE - 3
Details of Bus routes West side (Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
175	241M	K.R.Market	Savanadurga
176	242JK	K.R.Market	Karekal Palya
177	242L	K.R.Market	Manchenahalli
178	242LA	K.R.Market	Baleveerana Halli
179	245GA	Kempegowda Bus Station	Kadabagere
180	241Q	Shivajinagar	Madeshwara Nagara
181	245C	K.R.Market	Kadabagere
182	240F	K.R.Market	nelamangala
183	240A	Shivajinagar	Machohalli
184	242V	K.R.Market	Chikkanahalli
185	240M	K.R.Market	Magadi
186	242ZD	Kempegowda Bus Station	Kallur
187	242Z	Kempegowda Bus Station	Thippagondanahalli quarters
188	243L	Kempegowda Bus Station	Lingadeeranhalli
189	242GA	Kempegowda Bus Station	Byadarahalli
190	242CB	Kempegowda Bus Station	Thunganagara
191	241H	Kempegowda Bus Station	Madeshwara Nagara
192	241CB	Kempegowda Bus Station	Yale Kodigehalli
193	241B	Kempegowda Bus Station	Kenchanapura
194	240H	Kempegowda Bus Station	G Hosahalli
195	240D	Kempegowda Bus Station	Kenchanapura
196	242JA	Shivajinagar	Ganakkal
197	245R	Shivajinagar	Kittanahalli
198	245N	Shivajinagar	Janapriya Township
199	241E	Kempegowda Bus Station	Lakshmaiah Badavane
200	240J	K.R.Market	Chikkamaskal
201	245A	K.R.Market	Nelamangala
202	240R	Kempegowda Bus Station	Kachohalli
203	243H	Shivajinagar	Thigalara Palya
204	243J	Kempegowda Bus Station	Bhavani nagar 2nd satge
205	243G	K.R.Market	Thigalara Palya
206	243F	Kempegowda Bus Station	Gidadakonenahalli, muddinapalya
207	243D	Kempegowda Bus Station	Thigalara Palya
208	245Q	Kempegowda Bus Station	Bettahalli
209	245D	K.R.Market	Bettahalli
210	61	Kempegowda Bus Station	vijaynagar ttmc
211	61g	Kempegowda Bus Station	Chandra Layout
212	61m	Kempegowda Bus Station	vidhyagiri layout 1st stage
213	265J	Kempegowda Bus Station	Jalahalli Cross
214	238VA	Shivajinagar	Bande Maramma Bus Station
215	238UA	Shivajinagar	Bande Maramma Bus Station
216	265D	Kempegowda Bus Station	Vigneshwara Nagara
217	265B	Kempegowda Bus Station	Thigalara Palya
218	265A	Kempegowda Bus Station	Kempegowda Bus Station
219	246	Kempegowda Bus Station	Annapoorneshwari Nagar
220	87A	Kempegowda Bus Station	hampinagar rpc layout
221	87C	Kempegowda Bus Station	hampinagar rpc layout
222	235Q	Kempegowda Bus Station	Maruthi Nagara
223	238	Kempegowda Bus Station	Nrupatunga Nagar
224	238A	Kempegowda Bus Station	Chandra Layout 1st Stage
225	238L	Kempegowda Bus Station	Nrupatunga Nagar
226	238C	Kempegowda Bus Station	Bande Maramma Bus Station
227	238U	Kempegowda Bus Station	Bangalore University ADM Block
228	238UB	Kempegowda Bus Station	Byadarahalli
229	238UC	Kempegowda Bus Station	Sir M Vishweshwaraiah Layout 9th Block
230	238V	Kempegowda Bus Station	Kengunte Circle
231	238VR	Kempegowda Bus Station	Kengunte Circle
232	66	Shivajinagar	KHB colony

ANNEXURE - 3
Details of Bus routes West side (Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
233	238Z	Shivajinagar	Amma ashrama
234	247	K.R.Market	KG Lakkenahalli
235	77	K.R.Market	Mahalakshmi Layout
236	77A	K.R.Market	Laxmidevi Nagar
237	77B	NRColony	Mahalakshmi Layout
238	77C	NRColony	Nandhini Layout Bus Station
239	77D	K.R.Market	Vidhanasoudha Layout
240	77E	K.R.Market	Nandhini Layout Bus Station
241	77F	K.R.Market	Jai Bhuvaneshwari Nagara
242	TR-12	Srinagara	YPR RMC
243	TR-12A	Girinagara Extension	YPR RMC
244	251E	K.R.Market	Laggere
245	240BA	K.R.Market	Maruthi Markandayanagara
246	244A	K.R.Market	Bande Maramma Bus Station
247	265E	Kempegowda Bus Station	Matthahalli
248	181	K.R.Market	Kaveri Nagara
249	87	Kempegowda Bus Station	hampinagar rpc layout
250	238ZA	Kempegowda Bus Station	Hullala Upanagara
251	235B	Kempegowda Bus Station	Chikkanahalli
252	238W	Kempegowda Bus Station	Narasipura
253	235D	Kempegowda Bus Station	sulikere
254	87S	Shivajinagar	hampinagar rpc layout
255	87B	Kempegowda Bus Station	Nayandahalli Railway Gate
256	235k	Kempegowda Bus Station	doddabasti
257	235P	Kempegowda Bus Station	Chikkanahalli
258	223P	Kempegowda Bus Station	Upkar Residency Layout
259	223PA	Kempegowda Bus Station	Upkar Residency Layout
260	267	K.R.Market	Laggere
261	60B	JPNagara 3rd Phase	Chandra Layout
262	60C	JPNagara 6th Phase	Chandra Layout
263	265	Kempegowda Bus Station	Kempegowda Bus Station
264	234C	Kempegowda Bus Station	Manganahalli
265	MBS-12	Marathahalli bridge	Annapoorneshwari Nagar
266	335SA	kadugodi	BEML 5th stage
267	221B	K.R.Market	Tavarekere
268	221D	K.R.Market	Kengeri Bandemata Badavane
269	221H	K.R.Market	Bettana Palya
270	221J	K.R.Market	Tavarekere Magadi Road
271	221K	K.R.Market	Kommagatta
272	221L	K.R.Market	Nelamangala
273	222	K.R.Market	Kengeri Satelite Town
274	223D	K.R.Market	Doddabasthi
275	223E	K.R.Market	Ramasandra
276	223F	K.R.Market	Sulikere
277	223L	K.R.Market	Vishweshwaraiah Layout 1st Block
278	224DA	K.R.Market	Devagere
279	225	K.R.Market	Channasandra
280	225A	K.R.Market	BGS Health City
281	225F	K.R.Market	Kariyana Palya
282	225K	K.R.Market	BHEL Layout Maramma Temple
283	226R	K.R.Market	Parasanapalya
284	220D	K.R.Market	Doddabele
285	224A	K.R.Market	Varahasandra
286	224D	K.R.Market	Doddipalya
287	224	K.R.Market	Karubele
288	225P	K.R.Market	Bangarappa Nagara
289	226B	K.R.Market	Hampapura
290	226C	K.R.Market	Thimmappana Palya

ANNEXURE - 3
Details of Bus routes West side (Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
291	226D	K.R.Market	Vajarahalli
292	226E	K.R.Market	Channegowdana Doddi
293	226F	K.R.Market	Bidadi
294	226K	K.R.Market	Shanumangala
295	226L	K.R.Market	Hakki Pikki Colony
296	226S	K.R.Market	Anchipura colony
297	226T	K.R.Market	Talaguppe
298	226M	K.R.Market	Bidadi
299	226	K.R.Market	Bilakempanahalli
300	223H	K.R.Market	dhananayakanahalli
301	221E	K.R.Market	Ramasandra
302	221C	K.R.Market	Doddabasthi
303	218	K.R.Market	kambhipura
304	226U	K.R.Market	Kenchanaguppe
305	226V	K.R.Market	Thoredoddi
306	226VA	K.R.Market	M Gopahalli
307	226VB	K.R.Market	Annahalli
308	226VC	K.R.Market	Manchegowdana palya
309	226Y	K.R.Market	Katammana Doddi
310	227	K.R.Market	Ramohalli
311	227A	K.R.Market	Mayasandra
312	227B	K.R.Market	Tavare Kere
313	227C	K.R.Market	Beemanakuppe
314	227D	K.R.Market	Uddanahalli
315	227F	K.R.Market	Chikkanahalli
316	227E	K.R.Market	Huluvenahalli
317	227G	K.R.Market	Subbarayappana Palya
318	227H	K.R.Market	Kurubarapalya
319	227J	K.R.Market	Malligondanahalli
320	227K	K.R.Market	Basammanahalli
321	227L	K.R.Market	Alammana Palya
322	227M	K.R.Market	Magadi
323	227N	K.R.Market	Punugumaranahalli
324	227NA	K.R.Market	Madapatna
325	227P	K.R.Market	Hunnigere
326	227Q	K.R.Market	Doddamaranahalli
327	227R	K.R.Market	Byalalu Janatha Colony
328	227RB	K.R.Market	Giriyappanapalya
329	227RC	K.R.Market	Chandrappa Circle
330	227S	K.R.Market	Gollahalli
331	227T	K.R.Market	CK Thandya
332	227U	K.R.Market	Hagalahalli
333	227UB	K.R.Market	Melehalli
334	227V	K.R.Market	Hagalahalli
335	227VA	K.R.Market	Veeregowdana Doddi
336	227VB	K.R.Market	Gadigaiahana Doddi ,Manchanabele
337	227VC	K.R.Market	Dabbaguli
338	227W	K.R.Market	Avarehalli
339	227Y	K.R.Market	Mukthinaga temple
340	227Z	K.R.Market	Sugganahalli
341	227ZA	K.R.Market	Thirumalapura
342	228	K.R.Market	Gonipura
343	228A	K.R.Market	Parasanapalya
344	228B	K.R.Market	Thittahalli
345	228C	K.R.Market	Dodda Kuntanahalli
346	228E	K.R.Market	Thippuru
347	228F	K.R.Market	Chikka Kuntanahalli
348	228G	K.R.Market	Kenchanapalya

ANNEXURE - 3
Details of Bus routes West side (Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
349	229D	K.R.Market	Kaggalipura
350	229	K.R.Market	Gaviyana Palya
351	230	K.R.Market	Byrohalli
352	230A	K.R.Market	Bettanapalya
353	231	K.R.Market	Mayasandra
354	231A	K.R.Market	Avaragere
355	231B	K.R.Market	Bannikuppe
356	231C	K.R.Market	Muthurayanagudi Palya
357	231E	K.R.Market	Ganakkal
358	231D	K.R.Market	Bethimgere
359	231F	K.R.Market	Kakaramana Halli
360	231G	K.R.Market	Kempa Dyapanahalli
361	231H	K.R.Market	Devalingaiah Palya
362	231J	K.R.Market	Guddadahalli Dinne
363	231K	K.R.Market	Bidadi
364	231P	K.R.Market	Bidadi
365	234	K.R.Market	Manganahalli
366	234A	K.R.Market	Hullala Upanagara
367	G-6	Shanthinagar TTMC	Shirke KHB Quarters
368	218A	Kempegowda Bus Station	kambhipura
369	220E	Kempegowda Bus Station	Doddabele
370	221F	Kempegowda Bus Station	Hunisemarada Palya
371	221G	Kempegowda Bus Station	Kengeri Bandemata Badavane
372	222A	Kempegowda Bus Station	Kengeri Satelite Town
373	222C	Kempegowda Bus Station	Upadyaya Badavane
374	222F	Kempegowda Bus Station	Shirke KHB Quarters
375	224C	Kempegowda Bus Station	Karubele
376	225AB	K.R.Market	Srinivasapura Colony
377	225C	K.R.Market	BEML Layout 5th Stage
378	225CB	K.R.Market	BHEL Layout
379	225G	Kempegowda Bus Station	Bangarappa Nagara
380	226A	Kempegowda Bus Station	Hampapura
381	226J	Kempegowda Bus Station	Thimmappana Palya
382	226N	Kempegowda Bus Station	Bidadi
383	226NA	Kempegowda Bus Station	Kempaiahanapalya
384	226NB	Kempegowda Bus Station	Kempegowda Bus Station
385	226Q	Kempegowda Bus Station	Bidadi
386	226SB	Kempegowda Bus Station	Byramangala
387	228H	Kempegowda Bus Station	Thippuru
388	228J	Kempegowda Bus Station	Srinivasapura ,K Gollahalli
389	228K	Kempegowda Bus Station	Bidadi
390	230B	Kempegowda Bus Station	Bettanapalya
391	231M	Kempegowda Bus Station	Bidadi
392	234E	Kempegowda Bus Station	Hullala Upanagara
393	235E	Kempegowda Bus Station	Papareddy Palya
394	222K	Shivajinagar	Shirke KHB Quarters
395	223A	Shivajinagar	Doddabasthi
396	226G	Shivajinagar	Bidadi
397	234F	Shivajinagar	AGS Layout Manganahalli
398	239B	Shivajinagar	BHEL Layout Maramma Temple
399	239D	Shivajinagar	Bangarappa Nagara
400	219	K.R.Market	K.R.Market
401	222N	Kempegowda Bus Station	Police quarters
402	225D	Kempegowda Bus Station	BHEL Concrode Layout
403	225DA	K.R.Market	BHEL Concrode Layout
404	226P	K.R.Market	Karenahalli
405	221	K.R.Market	Gulganjahalli
406	226MB	Shivajinagar	Manchanabele

ANNEXURE - 3
Details of Bus routes West side (Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
407	335S	Kadugodi	BEML Layout 5th Stage
408	235H	Bande Maramma Bus Station	Jayanagara 9th Block
409	237J	Bande Maramma Bus Station	Jayanagara 9th Block
410	240P	Jayanagara 9th Block	Machohalli
411	K-3	CPWD Quarters	Basaveshwara Nagara
412	410J	Shankararnag Bus Stop	Jayanagra 4th block TTMC
413	410FB	Jayanagar TTMC	Yeshwanthpura TTMC
414	410F	Jayanagar TTMC	Yeshwanthpura TTMC
415	59F	Kempegowda Bus Station	Chandra Layout 1st Stage
416	238AB	Kempegowda Bus Station	ITI Layout
417	234EK	Koramangala	Hullala Upanagara
418	MF-16	Vijaynagar	Shnathinagar TTMC
419	MF-18	Jayanagar TTMC	Ambedkar college
420	238S	K.R. Market	Annapoorneshwari Nagar
421	MF-13	Vijaynagar	Vijaynagar
422	MF-13A	Vijaynagar	Vijaynagar
423	238B	Kempegowda Bus Station	Nrupatunga Nagar

ANNEXURE - 3
Details of Bus routes East Side(Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
1	114E	Banashankari TTMC	Sulthanpalya
2	201G	Banashankari TTMC	Jeevan Bhimanagara Bus stand
3	201RB	Banashankari TTMC	CV Raman Nagara
4	314M	Banashankari TTMC	Mallesh Palya New Bus Stand
5	MBS-8	Banashankari TTMC	Kalyananagara Bus Stand
6	201S	Banashankari TTMC	Domlur TTMC
7	KIAS-5B	Bannerughatta Circle	Kempegowda International Airport
8	MF-3	Bayyapanahalli Back Gate	KR Puram
9	MF-8	Bayyapanahalli Back Gate	Kalyananagara Bus Stand
10	G-3	Brigade Road	Electronic City Wipro Gate
11	G-4	Brigade Road	Bannerghatta National Park
12	50	Brudhavan Nagar	Shivajinagar bus station
13	TR-7	BSK 3rd Stage 2nd Phase	Jeevanahalli
14	201Q	Central silk board	Jeevan Bhimanagara Bus stand
15	MF-5	Central silk board	Old Bayappanahalli
16	MF-6	Central silk board	Swamy Vivekananda Metro Station
17	201D	Central silk board	Binnamangala
18	138A	City Railway station	Jeevan Bhimanagara Bus stand
19	V-331A	Contornment Railway station	Kadugodi
20	306MA	Dooravani Nagar	Jayamangala
21	V-505A	Electronic city wipro gate	CV Raman Nagara
22	MBS-8E	Electronic city wipro gate	Kalyananagara Bus Stand
23	201B	Girinagar	Domlur TTMC
24	319E	Halasur	Hope farm
25	KIAS-7	HSR Layout BDA Complex	Kempegowda International Airport
26	KIAS-7A	HSR Layout BDA Complex	Kempegowda International Airport
27	412	ISRO layout	Hennur Cross
28	TR-4	Jagajeevanram Nagar	Nagavara
29	TR-4A	Jagajeevanram Nagar	Ramakrishna hegade nagar
30	201K	Jaraganahalli Co-Op-Society Layout	Domlur TTMC
31	G-12	Jayanagara 9th Block	Hosakote
32	169	Jeevanahalli	Cauverynagar
33	111E	JJ Nagar	Kaval byrasandra
34	291R	JJ Nagar	Govinda Pura
35	313B	K.R.Market	Vijanapura
36	MKT-12HK	K.R.Market	Hosakote Bus Stand
37	309	K.R.Market	DRDO TOWNSHIP BUS STAND
38	111	K.R.Market	Kaval Byrasandra
39	114	K.R.Market	Sulthanpalya
40	108	K.R.Market	Anandanagar
41	114G	K.R.Market	Manorayana Palya
42	301	K.R.Market	K Chansandra
43	301A	K.R.Market	Banaswadi
44	G-10	K.R.Market	Ramakrishna Hegde Nagara
45	303	K.R.Market	Banaswadi

ANNEXURE - 3
Details of Bus routes East Side(Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
46	119B	K.R.Market	Marappa Garden
47	314FA	K.R.Market	Mallesh Palya New Bus Stand
48	314G	K.R.Market	Byrasandra
49	296M	K.R.Market	Devanahalli
50	291	K.R.Market	Dasarahalli
51	291A	K.R.Market	Agrahara Layout
52	291E	K.R.Market	Ambedkar Medical College Shampura
53	291J	K.R.Market	Ramakrishna Hegde Nagara
54	293K	K.R.Market	Mailanahalli Bagalur
55	293J	K.R.Market	Marasandra Bagalur
56	293M	K.R.Market	Byala Halli
57	294	K.R.Market	Bileshivale
58	294D	K.R.Market	Anagalipura
59	302E	K.R.Market	Chalekere
60	290N	K.R.Market	Thanisandra
61	290R	K.R.Market	Razak Palya
62	290T	K.R.Market	H Tippunagar
63	291N	K.R.Market	Govinda Pura
64	293A	K.R.Market	Horamavu Agara
65	293D	K.R.Market	Singahalli
66	293L	K.R.Market	Yarappana Bande
67	295	K.R.Market	Dodda Gubbi
68	302D	K.R.Market	Kalyananagara Bus Stand
69	302H	K.R.Market	Kalyananagara Bus Stand
70	303E	K.R.Market	Horamavu
71	300A	K.R.Market	BChannasandra
72	K-6	Kalyan Nagara	Jambusavari dinne
73	304B	Kempegowda Bus Station	Hoodi
74	304J	Kempegowda Bus Station	Kallukunte agrahara
75	304R	Kempegowda Bus Station	BN Bachegowda Badavane
76	307B	Kempegowda Bus Station	Kadugodi
77	315E	Kempegowda Bus Station	Sadaramangala
78	315J	Kempegowda Bus Station	Rampura
79	316G	Kempegowda Bus Station	Mandooru
80	316M	Kempegowda Bus Station	Singahalli
81	304H	Kempegowda Bus Station	Arehalli
82	304Z	Kempegowda Bus Station	Chikkathirupathi
83	305D	Kempegowda Bus Station	Channasandra
84	305L	Kempegowda Bus Station	Vaghta
85	305S	Kempegowda Bus Station	Soukhya Hospital
86	306D	Kempegowda Bus Station	Devanagundi
87	315	Kempegowda Bus Station	KR Puram
88	315F	Kempegowda Bus Station	Sigehalli
89	316B	Kempegowda Bus Station	Budigere
90	316E	Kempegowda Bus Station	Hancharahalli

ANNEXURE - 3
Details of Bus routes East Side(Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
91	316J	Kempegowda Bus Station	Kattugollahalli
92	321G	Kempegowda Bus Station	Muthkur
93	320A	Kempegowda Bus Station	Nagagondanahalli
94	383A	Kempegowda Bus Station	Poojena agrahara
95	383C	Kempegowda Bus Station	Bommanabande
96	317P	Kempegowda Bus Station	Kannamangala
97	317V	Kempegowda Bus Station	Naduvatti
98	317YB	Kempegowda Bus Station	Kaji Hosahalli
99	319G	Kempegowda Bus Station	Ambedikar Nagar
100	322A	Kempegowda Bus Station	Tattanur
101	381	Kempegowda Bus Station	Thimmasandra
102	383	Kempegowda Bus Station	Poojena agrahara
103	383D	Kempegowda Bus Station	Makanahalli
104	KBS-12HK	Kempegowda Bus Station	Hosakote
105	V-319CT	Kempegowda Bus Station	White field TTMC
106	304M	Kempegowda Bus Station	Alambadi
107	304X	Kempegowda Bus Station	Arehalli
108	305M	Kempegowda Bus Station	Tarabanahalli
109	305Q	Kempegowda Bus Station	Pichguntarahalli
110	305R	Kempegowda Bus Station	Dodda dasarahalli
111	305V	Kempegowda Bus Station	Devalapura
112	319F	Kempegowda Bus Station	Pattandur agrahara
113	320B	Kempegowda Bus Station	Gandhipura
114	308A	Kempegowda Bus Station	Marasandra
115	316F	Kempegowda Bus Station	Chimmasandra
116	381E	Kempegowda Bus Station	Lakkondahalli
117	315DN	Kempegowda Bus Station	NRI Layout
118	315L	Kempegowda Bus Station	KR Puram
119	315T	Kempegowda Bus Station	Kittaganur
120	400A	Kempegowda Bus Station	KR Puram
121	315P	Kempegowda Bus Station	Shanthi layout
122	319C	Kempegowda Bus Station	Kadugodi
123	KBS-13K	Kempegowda Bus Station	Kadugodi
124	315V	Kempegowda Bus Station	Kadugodi Ayyappa Temple
125	V-317A	Kempegowda Bus Station	Hosakote Bus Stand
126	126A	Kempegowda Bus Station	Jeevanahalli
127	291H	Kempegowda Bus Station	Ramakrishna Hegde Nagara
128	292C	Kempegowda Bus Station	KNarayanapura
129	293H	Kempegowda Bus Station	Dasanayakanahalli
130	293S	Kempegowda Bus Station	Bagaluru
131	296B	Kempegowda Bus Station	HBR Layout 5th Block
132	296F	Kempegowda Bus Station	Marasandra Bagalur
133	302B	Kempegowda Bus Station	Kalyananagara Bus Stand
134	126	Kempegowda Bus Station	Jeevanahalli
135	290EY	Kempegowda Bus Station	Yelahanka

ANNEXURE - 3
Details of Bus routes East Side(Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
136	122	Kempegowda Bus Station	Old Byappanahalli
137	290B	Kempegowda Bus Station	Thanisandra
138	290D	Kempegowda Bus Station	Shampura
139	290J	Kempegowda Bus Station	Mestripalya
140	291M	Kempegowda Bus Station	Govinda Pura
141	292B	Kempegowda Bus Station	Nagaresha Nagenahalli Dinne
142	292E	Kempegowda Bus Station	Nagaresha Nagenahalli Dinne
143	294B	Kempegowda Bus Station	Jyothi Nagara
144	294E	Kempegowda Bus Station	Bileshivale
145	294F	Kempegowda Bus Station	Rampura
146	295A	Kempegowda Bus Station	Dodda Gubbi
147	295E	Kempegowda Bus Station	Bande Bommasandra
148	296A	Kempegowda Bus Station	Yarappanahalli
149	296C	Kempegowda Bus Station	Kalyananagara Bus Stand
150	296N	Kempegowda Bus Station	Kada Agrahara
151	296T	Kempegowda Bus Station	HBR Layout Ist Stage
152	296V	Kempegowda Bus Station	HBR Layout BDA Complex
153	300B	Kempegowda Bus Station	Banaswadi
154	300C	Kempegowda Bus Station	KR Puram
155	300H	Kempegowda Bus Station	KR Puram
156	301F	Kempegowda Bus Station	Thambuchetty Palya
157	302A	Kempegowda Bus Station	Babusab Palya
158	302N	Kempegowda Bus Station	Kalyananagara Bus Stand
159	303A	Kempegowda Bus Station	Jayanthi Nagar
160	129	Kempegowda Bus Station	Shivajinagar bus station
161	302F	Kempegowda Bus Station	Babusab palya
162	KBS-1I	Kempegowda Bus Station	Kadugodi
163	KBS-1K	Kempegowda Bus Station	Kadugodi
164	138	Kempegowda Bus Station	Jeevan Bhimanagara Bus stand
165	138D	Kempegowda Bus Station	Jeevan Bhimanagara Bus stand
166	314D	Kempegowda Bus Station	Mallesh Palya New Bus Stand
167	314B	Kempegowda Bus Station	CV Raman Nagara
168	314E	Kempegowda Bus Station	DRDO 2ND Phase
169	314F	Kempegowda Bus Station	Vibhuthipura Samudaya Bhavana
170	314H	Kempegowda Bus Station	Mallesh Palya New Bus Stand
171	314T	Kempegowda Bus Station	Ramesh nagara
172	314X	Kempegowda Bus Station	Abbaiah Layout
173	131	Kempegowda Bus Station	Domlur
174	293B	Kempegowda Bus Station	Kada Agrahara
175	293F	Kempegowda Bus Station	Hunasooru
176	293	Kempegowda Bus Station	Razak Palya
177	304P	KR MARKET	Yattukodi
178	304V	KR MARKET	Chikkathirupathi
179	305	KR MARKET	Naduvatti
180	305B	KR MARKET	Makanahalli

ANNEXURE - 3
Details of Bus routes East Side(Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
181	305F	KR MARKET	Naduvatti Colony
182	305N	KR MARKET	Kittiganahalli
183	306	KR MARKET	Devanagundi
184	306E	KR MARKET	Narayanakere
185	306J	KR MARKET	Domlur
186	306G	KR MARKET	Somalapura
187	306L	KR MARKET	Marasandra
188	308	KR MARKET	Gunduru Colony
189	313K	KR MARKET	Ayyappa Nagara
190	316D	KR MARKET	Bhattaramarenahalli
191	316A	KR MARKET	Gangawara
192	316K	KR MARKET	Kaggalahalli
193	304E	KR MARKET	Kallukunte agrahara
194	304N	KR MARKET	Anugondanahalli
195	304Q	KR MARKET	Ganagaluru
196	305A	KR MARKET	Bhaktharahalli
197	305G	KR MARKET	Devashettyhalli
198	305J	KR MARKET	Hosakote
199	306T	KR MARKET	Banarahalli
200	306H	KR MARKET	Handaenahalli
201	306K	KR MARKET	Devanagundi
202	306M	KR MARKET	Pura
203	306P	KR MARKET	Harsnahalli
204	306F	KR MARKET	Banarahalli
205	307C	KR MARKET	Doddabannahalli
206	308B	KR MARKET	Marasandra
207	313G	KR MARKET	Gayatri Layout
208	316	KR MARKET	Budigere
209	316L	KR MARKET	Chimmasandra
210	316N	KR MARKET	Handrahalli
211	316Q	KR MARKET	Kaggalahalli
212	317C	KR MARKET	Poojena agrahara
213	381A	KR MARKET	Lakkondahalli
214	317J	KR MARKET	Kacharakanahalli
215	317M	KR MARKET	Dasarahalli
216	317N	KR MARKET	Kamarasanahalli
217	317S	KR MARKET	Beguru
218	317Q	KR MARKET	Nelavagilu
219	317T	KR MARKET	Jinnagara
220	317TD	KR MARKET	Devashettyhalli
221	317W	KR MARKET	Ganagaluru
222	317YA	KR MARKET	Kattiganahalli
223	317YE	KR MARKET	Govindapura
224	318	KR MARKET	Jyothipura
225	319B	KR MARKET	Chikka Banahalli

ANNEXURE - 3
Details of Bus routes East Side(Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
226	319J	KR MARKET	Dinnur
227	324E	KR MARKET	Vijayanagar
228	321	KR MARKET	Muthkur
229	321D	KR MARKET	Naganayakana kote
230	322C	KR MARKET	Channasandra
231	317E	KR MARKET	Kumbalahalli
232	381J	KR MARKET	Gullahalli
233	382C	KR MARKET	Doddanallala
234	382A	KR MARKET	Shivapura
235	382M	KR MARKET	Koratageredoddi
236	316R	KR MARKET	Bidalapura
237	317D	KR MARKET	Kannurahalli
238	317K	KR MARKET	Kurabarahalli
239	317MA	KR MARKET	Gottipura
240	317R	KR MARKET	Chimandahalli
241	317SA	KR MARKET	Doddanalluralli
242	317TA	KR MARKET	Paramanahalli
243	317Y	KR MARKET	Govindapura
244	317Z	KR MARKET	Kaji Hosahalli
245	319	KR MARKET	Khazi sonnehalli
246	321C	KR MARKET	Samethanahalli
247	322M	KR MARKET	Tattanur
248	381D	KR MARKET	E Muthasandra
249	381G	KR MARKET	Vabasandra
250	382	KR MARKET	Kallahalli
251	382B	KR MARKET	Nidagatta
252	383B	KR MARKET	Honachanahalli
253	304	KR MARKET	Arehalli
254	304C	KR MARKET	Channasandra
255	304T	KR MARKET	Dunnasandra cross
256	305P	KR MARKET	Bommanabande
257	306A	KR MARKET	Lingadira Mallasandra
258	306C	KR MARKET	Kanikala
259	306B	KR MARKET	Tindlu
260	307	KR MARKET	Rampura
261	316C	KR MARKET	Huskur
262	316T	KR MARKET	Somathanahalli
263	316U	KR MARKET	Nallur
264	316V	KR MARKET	Byappanahalli Satallite
265	317B	KR MARKET	Kannamangala
266	318E	KR MARKET	Tirumenahalli
267	380G	KR MARKET	Dandupalya
268	380B	KR MARKET	Nidagatta
269	380BA	KR MARKET	Thavathahalli
270	380C	KR MARKET	Haralur

ANNEXURE - 3
Details of Bus routes East Side(Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
271	380E	KR MARKET	Soluru
272	380F	KR MARKET	Devashettyhalli
273	380	KR MARKET	Kolathur
274	380N	KR MARKET	Ummalu
275	380Q	KR MARKET	Orahalli
276	381H	KR MARKET	Bhavapura
277	381K	KR MARKET	Bettahalli
278	382D	KR MARKET	Mugabala
279	313F	KR MARKET	Rampura
280	313L	KR MARKET	Ramamurty Nagar
281	313P	KR MARKET	Shanthi layout
282	313T	KR MARKET	Thambuchetty Palya
283	315D	KR MARKET	Rampura
284	313J	KR MARKET	Jinke Thimmanahalli
285	304NA	KR MARKET	Obalapura
286	322	KR MARKET	Muthugadahalli
287	326C	KR MARKET	Kadugodi Ayyappa Temple
288	324A	KR MARKET	Nagagondanahalli
289	314C	KR MARKET	CGHS Nagavar Palya
290	290HA	KR MARKET	Ambedikar Medical Collage
291	290KA	KR MARKET	Nagavara
292	292	KR MARKET	Nagaresha Nagenahalli Dinne
293	293C	KR MARKET	K Narayanakere
294	294A	KR MARKET	Kadasonnapanahalli
295	290RA	KR MARKET	Vidyanagara cross
296	293E	KR MARKET	Chikkajala
297	VMF-10	KR Puram	Central silk board
298	201MA	Madivala Masque	Jeevan Bhima Nagara
299	MBS-2	Maratahalli Bridge	Yelahanka Satelite Town
300	G-11	MG Road metro station	Bagaluru
301	319K	Nandini Layout	Kadugodi
302	201J	Padmanabha Nagar Rock	Jeevan Bhimanagara Bus stand
303	K-1	Peenya satellite Bus Stand	Central silk board
304	304D	Shivaji Nagar	Medi Mallasandra
305	305H	Shivaji Nagar	Naduvatti Colony
306	305K	Shivaji Nagar	Kittiganahalli
307	306Q	Shivaji Nagar	Devanagundi
308	311E	Shivaji Nagar	Ayyappa Nagara
309	311K	Shivaji Nagar	Kadugodi Ayyappa Temple
310	312A	Shivaji Nagar	Maragondanahalli
311	304S	Shivaji Nagar	Kallukunte agrahara
312	310	Shivaji Nagar	KR Puram
313	311J	Shivaji Nagar	Sigehalli
314	312	Shivaji Nagar	Kittaganur
315	313A	Shivaji Nagar	Maragondanahalli

ANNEXURE - 3
Details of Bus routes East Side(Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
316	320E	Shivaji Nagar	Nagagondanahalli
317	317G	Shivaji Nagar	Hosakote
318	320	Shivaji Nagar	Immadihalli
319	320H	Shivaji Nagar	Gandhipura
320	321E	Shivaji Nagar	Muthkur
321	SBS-13K	Shivaji Nagar	Kadugodi
322	320C	Shivaji Nagar	Vaidehi Hospital
323	310E	Shivaji Nagar	Kittaganur
324	310A	Shivaji Nagar	A Narayanapura
325	310B	Shivaji Nagar	Basavanapura Govt School
326	311	Shivaji Nagar	K R Puram
327	311C	Shivaji Nagar	Mini TajMahal
328	311F	Shivaji Nagar	K R Puram
329	310C	Shivaji Nagar	Udayanagara
330	323J	Shivaji Nagar	Koothaganahalli
331	330M	Shivaji Nagar	Ashwath Nagara
332	323L	Shivaji Nagar	Nerige
333	329D	Shivaji Nagar	Muthasandra
334	329G	Shivaji Nagar	Kotur
335	329J	Shivaji Nagar	Singanayakanahalli
336	330	Shivaji Nagar	Marathalli Bridge
337	330C	Shivaji Nagar	Basavanagara
338	330D	Shivaji Nagar	Dodda kannalli
339	330E	Shivaji Nagar	Devarabisanahalli
340	330H	Shivaji Nagar	Munnekolalu
341	331	Shivaji Nagar	Kadugodi
342	331A	Shivaji Nagar	Kadugodi
343	334EA	Shivaji Nagar	Hosakote
344	339A	Shivaji Nagar	Harohalli
345	SBS-1K	Shivaji Nagar	Kadugodi
346	330G	Shivaji Nagar	Doddanekkundi
347	330PG	Shivaji Nagar	Gunjoor
348	330P	Shivaji Nagar	Gunjoor
349	127	Shivaji Nagar	Jeevanahalli
350	362CA	Shivaji Nagar	Vishwapriya Layout
351	362	Shivaji Nagar	Vijayabank Layout
352	362K	Shivaji Nagar	Bandenallesandra
353	TR-3	Shivaji Nagar	Ejipura
354	V-362E	Shivaji Nagar	Electronic city
355	141E	Shivaji Nagar	Srinivagilu
356	141K	Shivaji Nagar	Koramangala
357	141G	Shivaji Nagar	Neelasandra
358	G-3A	Shivaji Nagar	Electronic City Wipro Gate
359	G-9A	Shivaji Nagar	Yelahanka satelite town
360	139	Shivaji Nagar	Jeevan Bhimanagara Bus stand

ANNEXURE - 3
Details of Bus routes East Side(Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
361	314	Shivaji Nagar	CGHS Nagavar Palya
362	314A	Shivaji Nagar	DRDO 2ND Phase
363	314N	Shivaji Nagar	Vibhuthipura Samudaya Bhavana
364	314P	Shivaji Nagar	Mallesh Palya New Bus Stand
365	132	Shivaji Nagar	Domlur
366	15k	Shivaji Nagar	Fayazabad
367	32E	Shivaji Nagar	Indira nursing home
368	34	Shivaji Nagar	Hosakerehalli
369	34A	Shivaji Nagar	BSK 3rd stage 2nd phase
370	34B	Shivaji Nagar	Vivekananda Nagara
371	34f	Shivaji Nagar	Krishnappa layout
372	37B	Shivaji Nagar	Timber yard layout
373	37	Shivaji Nagar	Srinagara
374	37E	Shivaji Nagar	Girinagara circle
375	210H	Shivaji Nagar	Uttarahalli
376	13	Shivaji Nagar	Banashankari TTMC
377	13A	Shivaji Nagar	Kumaraswamy layout 2nd stage
378	13B	Shivaji Nagar	Padmanabha Nagara Rock
379	13C	Shivaji Nagar	Kumaraswamy layout
380	13D	Shivaji Nagar	Kadirenahalli Park
381	13E	Shivaji Nagar	BSK 3rd stage 2nd phase
382	13F	Shivaji Nagar	Chennamanakere Achukattu
383	13H	Shivaji Nagar	AGS layout
384	13J	Shivaji Nagar	Hosakerehalli
385	13K	Shivaji Nagar	Minaz Nagara
386	20	Shivaji Nagar	Jayanagara 9th block
387	27A	Shivaji Nagar	NS palya
388	27	Shivaji Nagar	BTM layout south
389	27E	Shivaji Nagar	JP nagar 3rd phase
390	210FA	Shivaji Nagar	Poornapragna layout
391	210G	Shivaji Nagar	Vasanthapura
392	210Q	Shivaji Nagar	Chikkallasandra
393	215U	Shivaji Nagar	Kothnuru kanakapura rd
394	217E	Shivaji Nagar	Balaji layout
395	290P	Shivaji Nagar	Periyar nagara circle
396	150	Shivaji Nagar	KR market
397	154	Shivaji Nagar	vinayaka Nagara
398	68	Shivaji Nagar	Kamalanagara BEML Layout
399	74	Shivaji Nagar	Rajaji Nagar Rama Mandhir
400	79A	Shivaji Nagar	Yeshwanthapura TTMC
401	79B	Shivaji Nagar	Bandi reddy circle
402	79D	Shivaji Nagar	Mahalakshmi layout
403	79F	Shivaji Nagar	Jai bhuwaneswari nagar
404	79E	Shivaji Nagar	Nandhini layout
405	79G	Shivaji Nagar	Vidhanasoudha layout

ANNEXURE - 3
Details of Bus routes East Side(Origin and Destinations)

Sl.No	Bus route numbers	Origin	Destination
406	79J	Shivaji Nagar	Geleyara balaga AGB layout
407	95	Shivaji Nagar	Kamalanagara BEML Layout
408	95C	Shivaji Nagar	Kamalanagara BEML Layout
409	95G	Shivaji Nagar	Shankarnag
410	161B	Shivaji Nagar	Jaibheemanagara
411	161D	Shivaji Nagar	BTM layout
412	166	Shivaji Nagar	Koramangala
413	342R	Shivaji Nagar	Sarjapura
414	302	Shivaji Nagar	Kammana Halli
415	302G	Shivaji Nagar	Horamavu Agara
416	155	Shivaji Nagar	JJ Nagar
417	214A	Shivaji Nagar	Tattaguppe
418	302C	Shivaji Nagar	Babusab Palya
419	79k	Shivaji Nagar	Kurubarahalli
420	144G	Shivaji Nagar	Sulthanpalya
421	G-8	Shivaji Nagar	Nelamangala
422	V-201R	Srinagara	CV Raman Nagara
423	190	Srinagara	Jeevan Bhimanagara Bus stand
424	201L	Srinagara	Domlur TTMC
425	201N	Srinagara	Domlur TTMC
426	201	Srinagara	Domlur
427	197	Sulthapalya	Jeevan Bhimanagara Bus stand
428	13S	Sulthapalya	JHBS layout jaraganahalli
429	MF-1	SV Metro station	White field TTMC
430	VMF-1B	SV Metro station	White field TTMC
431	V-MF-11	SV Metro station	ITPL
432	121A	Timberyard layout	Shivajinagar bus station
433	290EB	Yelahanka	Jagajeevanram nagar
434	137	Yeshwanthpura	Domlur

Sl.no	Metro Station	Last mile Destinations
1	Baiyappanahalli	Hoodi, Medi Mallasandra, Kallunte Agrahara, Yattukodi, Chikka Thirupathi, BN Bacchegowda Badavane, Naduvatti, Makanahalli, Naduvatti Colony, Kattiganahalli, Kaji Hosahalli, Devanagudi, Narayanakere, Domlur, Somalapura, Marasandra, Jayamangala, Samethanahalli, Gunduru Colony, Kadugodi, Ayyappa Nagara, Kadugodi Ayyappa Temple, Maragondanahalli, KR Puram, Sadaramangala, Rampura, Mandooru, Bhattaramarenahlli, Gangawara, Kaggalahalli, Singanahlli, Anugondanahalli, Arehalli, Dodda Dunnasandra Cross, Ganagaluru, Channasandra, ITPL, Devashetty Halli, Hosakote, Vaghta, Soukhya Hospital, Banarahalli, Handenahalli, Devanagudi, Pura, Harsnahalli, Doddabannahalli, Marasandra, Sigehalli, Kittaganur, Gayathri Layout, Budigere, TC Playa, Hancharahalli, Kattugolahalli, Chimmasandra, Handrahalli, Poojena Agrahara, Lakkondanahalli, Kacharakanahalli, Dasarahalli, Kamarasanahalli, Beguru, Nelavagilu, Jinnagara, Chikmandahalli, Ganagaluru, Govindapura, Jyothipura, Chikka Banahalli, Dinnur, Vijayanagara, Nagagondanahalli, Muthkur, Naganayakana Kote, Gandhipura, Kumbalahalli, Kambalipura, Gullahalli, Doddanallala, Shivapura, Koratagere Doddi, Mugabala, Paramanahalli, Bidalapura, Nallur, Kannurahalli, Kurubarahalli, Gottipura, Kannamangala, Doddanalluralli, Khazi Sonnenahalli, Ambedkar Nagara, Immadihalli, Vaidehi Hospital / Whitefield TTMC, Tattanur, Thimmasandra, E Muthasandra, Vabasandra, Kallahalli, Nidaghatta, Honachanahalli, Makanahalli, Alamabadi, Tarabanahalli, Pichgunatarahalli, Dodda Dasarahalli, Devalapura, Lingadira Mallasandra, Kanikala, Thindlu, Pattandur Agrahara, Huskur, Somathanahalli, Byappanahalli Satellite, Tirumenahalli, Dandupalya, Nidagatta, Thavathahalli, Haralur, Soluru, Kolathur, Ummalu, Orahalli, Bhavapura, Bettahalli, Central Silk Board, Shanthi Layout, NRI Layout, Byappanahalli Backgate, Bhaktharahalli, NRI Layout, DRDO 2nd Phase, Kadugodi, Whitefield TTMC, Kadugodi Ayyappa Temple, Basavanpura, A Narayanapura, Mini Tajmahal, Vijinapura, Hosakote Bus Stand, Jinke Thimmanahalli, Udayanagar, Rampura, KR Puram, Hopefarm.
2	Swami vivekananda	Hoodi, Medi Mallasandra, Kallunte Agrahara, Yattukodi, Chikka Thirupathi, BN Bacchegowda Badavane, Naduvatti, Makanahalli, Naduvatti Colony, Kattiganahalli, Kaji Hosahalli, Devanagudi, Narayanakere, Domlur, Somalapura, Marasandra, Jayamangala, Samethanahalli, Gunduru Colony, Kadugodi, Ayyappa Nagara, Kadugodi Ayyappa Temple, Maragondanahalli, KR Puram, Sadaramangala, Rampura, Mandooru, Bhattaramarenahlli, Gangawara, Kaggalahalli, Singanahlli, Anugondanahalli, Arehalli, Dodda Dunnasandra Cross, Ganagaluru, Channasandra, ITPL, Devashetty Halli, Hosakote, Vaghta, Soukhya Hospital, Banarahalli, Handenahalli, Devanagudi, Pura, Harsnahalli, Doddabannahalli, Marasandra, Sigehalli, Kittaganur, Gayathri Layout, Budigere, TC Playa, Hancharahalli, Kattugolahalli, Chimmasandra, Handrahalli, Poojena Agrahara, Lakkondanahalli, Kacharakanahalli, Dasarahalli, Kamarasanahalli, Beguru, Nelavagilu, Jinnagara, Chikmandahalli, Ganagaluru, Govindapura, Jyothipura, Chikka Banahalli, Dinnur, Vijayanagara, Nagagondanahalli, Muthkur, Naganayakana Kote, Gandhipura, Kumbalahalli, Kambalipura, Gullahalli, Doddanallala, Shivapura, Koratagere Doddi, Mugabala, Paramanahalli, Bidalapura, Nallur, Kannurahalli, Kurubarahalli, Gottipura, Kannamangala, Doddanalluralli, Khazi Sonnenahalli, Ambedkar Nagara, Immadihalli, Vaidehi Hospital / Whitefield TTMC, Tattanur, Thimmasandra, E Muthasandra, Vabasandra, Kallahalli, Nidaghatta, Honachanahalli, Makanahalli, Alamabadi, Tarabanahalli, Pichgunatarahalli, Dodda Dasarahalli, Devalapura, Lingadira Mallasandra, Kanikala, Thindlu, Pattandur Agrahara, Huskur, Somathanahalli, Byappanahalli Satellite, Tirumenahalli, Dandupalya, Nidagatta, Thavathahalli, Haralur, Soluru, Kolathur, Ummalu, Orahalli, Bhavapura, Bettahalli, Central Silk Board, Shanthi Layout, NRI Layout, Byappanahalli Backgate, Bhaktharahalli, NRI Layout, DRDO 2nd Phase, Kadugodi, Whitefield TTMC, Kadugodi Ayyappa Temple, Basavanpura, A Narayanapura, Mini Tajmahal, Vijinapura, Hosakote Bus Stand, Jinke Thimmanahalli, Udayanagar, Rampura, KR Puram, Hopefarm.
3	Indiranagar	Abbaiah layout, Banashankari TTMC, Binnamangala, Byrasandra, Central silk board, CGHS nagavarapalya, CV Raman nagar, Domlur, DRDO 2nd phase, Electronic city wipro gate, hennur cross, ISRO Layout, Jeevan Bhimanagar, kalyan nagar bus stand, Madivala masjid, Malleshpalya, old bayappanahalli, Padmanabha nagara rock, Ramesh nagara, Srinagara, swamy vivekananda metro station, Vibhuthipura samudhaya bhavana,
4	Halasuru	Hoodi, Medi Mallasandra, Kallunte Agrahara, Yattukodi, Chikka Thirupathi, BN Bacchegowda Badavane, Naduvatti, Makanahalli, Naduvatti Colony, Kattiganahalli, Kaji Hosahalli, Devanagudi, Narayanakere, Domlur, Somalapura, Marasandra, Jayamangala, Samethanahalli, Gunduru Colony, Kadugodi, Ayyappa Nagara, Kadugodi Ayyappa Temple, Maragondanahalli, KR Puram, Sadaramangala, Rampura, Mandooru, Bhattaramarenahlli, Gangawara, Kaggalahalli, Singanahlli, Anugondanahalli, Arehalli, Dodda Dunnasandra Cross, Ganagaluru, Channasandra, ITPL, Devashetty Halli, Hosakote, Vaghta, Soukhya Hospital, Banarahalli, Handenahalli, Devanagudi, Pura, Harsnahalli, Doddabannahalli, Marasandra, Sigehalli, Kittaganur, Gayathri Layout, Budigere, TC Playa, Hancharahalli, Kattugolahalli, Chimmasandra, Handrahalli, Poojena Agrahara, Lakkondanahalli, Kacharakanahalli, Dasarahalli, Kamarasanahalli, Beguru, Nelavagilu, Jinnagara, Chikmandahalli, Ganagaluru, Govindapura, Jyothipura, Chikka Banahalli, Dinnur, Vijayanagara, Nagagondanahalli, Muthkur, Naganayakana Kote, Gandhipura, Kumbalahalli, Kambalipura, Gullahalli, Doddanallala, Shivapura, Koratagere Doddi, Mugabala, Paramanahalli, Bidalapura, Nallur, Kannurahalli, Kurubarahalli, Gottipura, Kannamangala, Doddanalluralli, Khazi Sonnenahalli, Ambedkar Nagara, Immadihalli, Vaidehi Hospital / Whitefield TTMC, Tattanur, Thimmasandra, E Muthasandra, Vabasandra, Kallahalli, Nidaghatta, Honachanahalli, Makanahalli, Alamabadi, Tarabanahalli, Pichgunatarahalli, Dodda Dasarahalli, Devalapura, Lingadira Mallasandra, Kanikala, Thindlu, Pattandur Agrahara, Huskur, Somathanahalli, Byappanahalli Satellite, Tirumenahalli, Dandupalya, Nidagatta, Thavathahalli, Haralur, Soluru, Kolathur, Ummalu, Orahalli, Bhavapura, Bettahalli, Central Silk Board, Shanthi Layout, NRI Layout, Byappanahalli Backgate, Bhaktharahalli, NRI Layout, DRDO 2nd Phase, Kadugodi, Whitefield TTMC, Kadugodi Ayyappa Temple, Basavanpura, A Narayanapura, Mini Tajmahal, Vijinapura, Hosakote Bus Stand, Jinke Thimmanahalli, Udayanagar, Rampura, KR Puram, Hopefarm, Abbaiah layout, Banashankari TTMC, Binnamangala, Byrasandra, Central silk board, CGHS nagavarapalya, CV Raman nagar, Domlur, DRDO 2nd phase, Electronic city wipro gate, hennur cross, ISRO Layout, Jeevan Bhimanagar, kalyan nagar bus stand, Madivala masjid, Malleshpalya, old bayappanahalli, Padmanabha nagara rock, Ramesh nagara, Srinagara, swamy vivekananda metro station, Vibhuthipura samudhaya bhavana.
5	Trinity circle	Hoodi, Medi Mallasandra, Kallunte Agrahara, Yattukodi, Chikka Thirupathi, BN Bacchegowda Badavane, Naduvatti, Makanahalli, Naduvatti Colony, Kattiganahalli, Kaji Hosahalli, Devanagudi, Narayanakere, Domlur, Somalapura, Marasandra, Jayamangala, Samethanahalli, Gunduru Colony, Kadugodi, Ayyappa Nagara, Kadugodi Ayyappa Temple, Maragondanahalli, KR Puram, Sadaramangala, Rampura, Mandooru, Bhattaramarenahlli, Gangawara, Kaggalahalli, Singanahlli, Anugondanahalli, Arehalli, Dodda Dunnasandra Cross, Ganagaluru, Channasandra, ITPL, Devashetty Halli, Hosakote, Vaghta, Soukhya Hospital, Banarahalli, Handenahalli, Devanagudi, Pura, Harsnahalli, Doddabannahalli, Marasandra, Sigehalli, Kittaganur, Gayathri Layout, Budigere, TC Playa, Hancharahalli, Kattugolahalli, Chimmasandra, Handrahalli, Poojena Agrahara, Lakkondanahalli, Kacharakanahalli, Dasarahalli, Kamarasanahalli, Beguru, Nelavagilu, Jinnagara, Chikmandahalli, Ganagaluru, Govindapura, Jyothipura, Chikka Banahalli, Dinnur, Vijayanagara, Nagagondanahalli, Muthkur, Naganayakana Kote, Gandhipura, Kumbalahalli, Kambalipura, Gullahalli, Doddanallala, Shivapura, Koratagere Doddi, Mugabala, Paramanahalli, Bidalapura, Nallur, Kannurahalli, Kurubarahalli, Gottipura, Kannamangala, Doddanalluralli, Khazi Sonnenahalli, Ambedkar Nagara, Immadihalli, Vaidehi Hospital / Whitefield TTMC, Tattanur, Thimmasandra, E Muthasandra, Vabasandra, Kallahalli, Nidaghatta, Honachanahalli, Makanahalli, Alamabadi, Tarabanahalli, Pichgunatarahalli, Dodda Dasarahalli, Devalapura, Lingadira Mallasandra, Kanikala, Thindlu, Pattandur Agrahara, Huskur, Somathanahalli, Byappanahalli Satellite, Tirumenahalli, Dandupalya, Nidagatta, Thavathahalli, Haralur, Soluru, Kolathur, Ummalu, Orahalli, Bhavapura, Bettahalli, Central Silk Board, Shanthi Layout, NRI Layout, Byappanahalli Backgate, Bhaktharahalli, NRI Layout, DRDO 2nd Phase, Kadugodi, Whitefield TTMC, Kadugodi Ayyappa Temple, Basavanpura, A Narayanapura, Mini Tajmahal, Vijinapura, Hosakote Bus Stand, Jinke Thimmanahalli, Udayanagar, Rampura, KR Puram, Hopefarm, Abbaiah layout, Banashankari TTMC, Binnamangala, Byrasandra, Central silk board, CGHS nagavarapalya, CV Raman nagar, Domlur, DRDO 2nd phase, Electronic city wipro gate, hennur cross, ISRO Layout, Jeevan Bhimanagar, kalyan nagar bus stand, Madivala masjid, Malleshpalya, old bayappanahalli, Padmanabha nagara rock, Ramesh nagara, Srinagara, swamy vivekananda metro station, Vibhuthipura samudhaya bhavana, Ashwathpura, Basavanagara, Devarabisanahalli, dodda nekkundi, Doddakanneli, Gunjoor, Harohalli, Koothaganahalli, kotur, Marathalli bridge, munekolalu, muthasandra, Nerige, Singanayakanahalli,
6	M G road	Hoodi, Medi Mallasandra, Kallunte Agrahara, Yattukodi, Chikka Thirupathi, BN Bacchegowda Badavane, Naduvatti, Makanahalli, Naduvatti Colony, Kattiganahalli, Kaji Hosahalli, Devanagudi, Narayanakere, Domlur, Somalapura, Marasandra, Jayamangala, Samethanahalli, Gunduru Colony, Kadugodi, Ayyappa Nagara, Kadugodi Ayyappa Temple, Maragondanahalli, KR Puram, Sadaramangala, Rampura, Mandooru, Bhattaramarenahlli, Gangawara, Kaggalahalli, Singanahlli, Anugondanahalli, Arehalli, Dodda Dunnasandra Cross, Ganagaluru, Channasandra, ITPL, Devashetty Halli, Hosakote, Vaghta, Soukhya Hospital, Banarahalli, Handenahalli, Devanagudi, Pura, Harsnahalli, Doddabannahalli, Marasandra, Sigehalli, Kittaganur, Gayathri Layout, Budigere, TC Playa, Hancharahalli, Kattugolahalli, Chimmasandra, Handrahalli, Poojena Agrahara, Lakkondanahalli, Kacharakanahalli, Dasarahalli, Kamarasanahalli, Beguru, Nelavagilu, Jinnagara, Chikmandahalli, Ganagaluru, Govindapura, Jyothipura, Chikka Banahalli, Dinnur, Vijayanagara, Nagagondanahalli, Muthkur, Naganayakana Kote, Gandhipura, Kumbalahalli, Kambalipura, Gullahalli, Doddanallala, Shivapura, Koratagere Doddi, Mugabala, Paramanahalli, Bidalapura, Nallur, Kannurahalli, Kurubarahalli, Gottipura, Kannamangala, Doddanalluralli, Khazi Sonnenahalli, Ambedkar Nagara, Immadihalli, Vaidehi Hospital / Whitefield TTMC, Tattanur, Thimmasandra, E Muthasandra, Vabasandra, Kallahalli, Nidaghatta, Honachanahalli, Makanahalli, Alamabadi, Tarabanahalli, Pichgunatarahalli, Dodda Dasarahalli, Devalapura, Lingadira Mallasandra, Kanikala, Thindlu, Pattandur Agrahara, Huskur, Somathanahalli, Byappanahalli Satellite, Tirumenahalli, Dandupalya, Nidagatta, Thavathahalli, Haralur, Soluru, Kolathur, Ummalu, Orahalli, Bhavapura, Bettahalli, Central Silk Board, Shanthi Layout, NRI Layout, Byappanahalli Backgate, Bhaktharahalli, NRI Layout, DRDO 2nd Phase, Kadugodi, Whitefield TTMC, Kadugodi Ayyappa Temple, Basavanpura, A Narayanapura, Mini Tajmahal, Vijinapura, Hosakote Bus Stand, Jinke Thimmanahalli, Udayanagar, Rampura, KR Puram, Hopefarm, Abbaiah layout, Banashankari TTMC, Binnamangala, Byrasandra, Central silk board, CGHS nagavarapalya, CV Raman nagar, Domlur, DRDO 2nd phase, Electronic city wipro gate, hennur cross, ISRO Layout, Jeevan Bhimanagar, kalyan nagar bus stand, Madivala masjid, Malleshpalya, old bayappanahalli, Padmanabha nagara rock, Ramesh nagara, Srinagara, swamy vivekananda metro station, Vibhuthipura samudhaya bhavana, Ashwathpura, Basavanagara, Devarabisanahalli, dodda nekkundi, Doddakanneli, Gunjoor, Harohalli, Koothaganahalli, kotur, Marathalli bridge, munekolalu, muthasandra, Nerige, Singanayakanahalli, Bagaluru, Bande Nallasandra, Bannerghatta Circle, Bannerghatta National Park, BDA complex HSR layout, brigade Road, Ejipura, Electronic city, Electronic city wipro gate, Jeevanahalli, kadugodi ayyappa temple, Kadugodi Bus Station, kempegowda international Airport, Koramangala, Marathahalli Bridge, muthugadahalli, nagagondanahalli, Neelsandra Masjid Street, Srinivagilu, Vijaya bank layout, Vishwapriya Layout, Yalahanka, Yeshwanthapura TTMC.

Details of Last mile destinations

Sl.no	Metro Station	Last mile Destinations
7	Cubbon park	vidhanasoudha, Electronic city Wipro Gate, Yalahanka New town, Peenya satellite bus Station, Kaval Byrasandra, Periyar Nagar, Yelahanka old town, Sulthan palya, Sarjapura, Koramangala, BTM layout, Jaibheemanagara, Cauverynagar, Shankarnag, Kurubarahalli, Geleyara balaga AGB layout, Vidhanasoudha layout, Nandhini layout, Jai bhuwaneswari nagar, Mahalakshmi layout, Bandi reddy circle, Yeshwanthapura TTMC, Rajaji nagar rama mandhir, Kamalanagara BEML Layout, Kadasonnapanahalli, Chikkajala, K Narayanakere, Nagaresha nagenahalli dinne, Vidyanagara cross, nagavara, vinayaka nagara, KR market, Jambusavari dinne, Balaji layout, Kothnuru kanakapura rd, Chikkallasandra, Vasanthapura, Poornapragna layout, JP nagar 3rd phase, BTM layout south, NS palya, Jayanagara 9th block, JHBS layout jaraganahalli, Minaz Nagara, AGS layout, Chennamanakere Achukattu, Kadirenahalli Park, Kumaraswamy layout, Padmanabha Nagara Rock, Kumaraswamy layout 2nd stage, Banashankari TTMC, Girinagara circle, Srinagara, Timber yard layout, Krishnappa layout, Vivekananda nagara, BSK 3rd stage 2nd phase, Hosakerehalli, Indira nursing home, Fayazabad, Babusab palya, Doddagubbi, K Narayanpura, Muttugada Halli Chikkajala, K Channasandra, Yarappanabande, Singahalli, tataguppe, B Channasandra, Horamavu, Govinda pura, JJ Nagara, bagaluru, Kalyannagara bus stand, RK Hegde nagar, thanisandra, mylanahalli, kammanahalli, horamavu agara, chalakere, ambedkar college, dasarahalli, h tippu nagara, anagalipura, bileshivale, agrahara layout, kada agrahara, marasandra, razakpalya, hunasuru, devanahalli, bylahalli
8	Dr.B.R Ambedkar vidhansoudha	Bande Bommasanndra, bileshivale, Brundhavan nagara, Dasanayakanahalli, Doddagubbi, Govinda pura, HBR Layout 1st stage, HBR Layout 5th block, HBR Layout BDA Complex, Jayanthi Nagar, Jeevanahalli, JJ Nagara, Jyothinagara, K Channasandra, K Narayanapura, kada agrahara, Kalyannagara bus stand, Kaval byrasandra, KR Puram, Manorayanapalya, Marappa Garden, marasandra, Mestripalya, Nagesha Nagenahalli Dinne, Old Byappanhalli, Rampura, RK Hegde nagar, Shampura, Sulthanpalya, tataguppe, Thambuchetty palya, thanisandra, Timber yard layout, Uttarahalli, Yarappanahalli, Yelahanka
9	City railway station	Amma ashrama, ullala satellite town, narasapura, mahadeshwara nagara, kacholli, machohalli, bettahalli, kammasandra, averahalli, yalachaguppe, ganakkal, dodderi grama, kallur, nelamangala, mattahalli, Kenchanapura, chikkanahalli, maruthinagara, sulikere, ITI layout, chandra layout 1st stage, vidyagiri chandra layout, chandr layout, hampinagara rpc layout, g hosahalli, lingadeeranahalli, thigalarapalya, lakshmaiah badavane, sir m vishweshwaraiah layout 9th block, bhavani nagar 2nd stage, nrupathunga nagara, janapriya layout, jalahalli cross, vaddarahalli BMTC training centre, kittanahalli, bande maramma, kengunte circle, gidadakonenahalli, muddinapalya, thippagondanahalli quarters, tavarekere, vijaynagar ttmc, doddabasti, vigneshwara nagara, annapoorneshwari nagar, thunganagara, yale kodegihalli, gollarahatti, kadabagere, bangalore university ADM block, KHB colony, KG lakkenahalli, Bylakonehalli, seegehalli, Giddadapalya, Aralimaradapalya, Huluvenahalli, sulivara, sugganahalli, sripathihalli, hunnigere, mantanakurchi, vidhanasoudha layout, lakshmidevi nagara, jai bhuvaneshwari nagara, nandhini layout, mahalakshmi layout, cauvery nagara, RMC yard, giddenahalli, gangenahalli, jogerahalli, lakshmipura, kanuvanhalli, kothaganahalli, maruthi markandeyanagara, nagarahole nagara, andhrahalli, ravuthanahalli, biskur, savandurga, manchenahalli, chikka maskal, laggere, byadarahalli, brahma devara gudda, chikka kodigehalli, kannalli, baleveerahalli, heligeehalli colony, karikallu, upkar residency, chikkanahalli, karekalpalya, MAGADI, BEML 5th stage, Marathahalli bridge, Kadugodi, J.P.nagar 6th phase, J.P.nagar 3rd phase, Manganahalli, nayandahalli railway gate, Gollarahatti,
10	Magadi road	Chowdeshwari layout 1st stage, Janapriya township, RTO ullalu, kengeri satellite town, BGS Hospital, Ladies hostel university campus, Sports authority of india, Mysore road satellite bus station, chandra layout, GKW layout, nagarbhavi 9th block, BCC Layout, Hampinagara, R.P.C. Layout, Yeshwanthpura TTMC, manorayanapalya, Shampura, K Narayanapura, Nagarabhavi 2nd phase, D group emplyees layout, Kaval Byrasandra, Sulthanpalya, Ganganagara, Malleshwaram 18th cross, Nagarabhavi BDA complex, Saraswathinagara, Nagarabhavi 1st stage 3rd block, Vijaynagar TTMC, Kottigepalya, amma ashrama, ullala satellite town, narasapura, mahadeshwara nagara, kacholli, machohalli, bettahalli, kammasandra, averahalli, yalachaguppe, ganakkal, dodderi grama, kallur, nelamangala, mattahalli, Kenchanapura, chikkanahalli, maruthinagara, sulikere, ITI layout, chandra layout 1st stage, vidyagiri chandra layout, g hosahalli, lingadeeranahalli, thigalarapalya, lakshmaiah badavane, sir m vishweshwaraiah layout 9th block, bhavani nagar 2nd stage, nrupathunga nagara, janapriya layout, jalahalli cross, vaddarahalli BMTC training centre, kittanahalli, bande maramma, kengunte circle, gidadakonenahalli, muddinapalya, thippagondanahalli quarters, tavarekere, doddabasti, vigneshwara nagara, annapoorneshwari nagar, thunganagara, yale kodegihalli, gollarahatti, kadabagere, bangalore university ADM block, KHB colony, KG lakkenahalli, Bylakonehalli, seegehalli, Giddadapalya, Aralimaradapalya, Huluvenahalli, sulivara, sugganahalli, sripathihalli, hunnigere, mantanakurchi, vidhanasoudha layout, lakshmidevi nagara, jai bhuvaneshwari nagara, nandhini layout, mahalakshmi layout, cauvery nagara, RMC yard, giddenahalli, gangenahalli, jogerahalli, lakshmipura, kanuvanhalli, kothaganahalli, maruthi markandeyanagara, nagarahole nagara, andhrahalli, ravuthanahalli, biskur, savandurga, manchenahalli, chikka maskal, laggere, byadarahalli, brahma devara gudda, chikka kodigehalli, kannalli, baleveerahalli, heligeehalli colony, karikallu, upkar residency, chikkanahalli, karekalpalya, MAGADI, BEML 5th stage, Marathahalli bridge, Kadugodi, J.P.nagar 6th phase, J.P.nagar 3rd phase, Manganahalli, nayandahalli railway Gate.
11	Hosahalli	Chowdeshwari layout 1st stage, Janapriya township, RTO ullalu, kengeri satellite town, BGS Hospital, Ladies hostel university campus, Sports authority of india, Mysore road satellite bus station, chandra layout, GKW layout, Nagarbhavi 9th block, BCC Layout, Hampinagara, R.P.C. Layout, Yeshwanthpura TTMC, manorayanapalya, Shampura, K Narayanapura, Nagarabhavi 2nd phase, D group emplyees layout, Kaval Byrasandra, Sulthanpalya, Ganganagara, Malleshwaram 18th cross, Nagarabhavi BDA complex, Saraswathinagara, Nagarabhavi 1st stage 3rd block, Vijaynagar TTMC, Kottigepalya, amma ashrama, ullala satellite town, Narasapura, mahadeshwara nagara, kacholli, machohalli, bettahalli, kammasandra, averahalli, yalachaguppe, ganakkal, dodderi grama, kallur, Nelamangala, mattahalli, Kenchanapura, chikkanahalli, maruthinagara, sulikere, ITI layout, chandra layout 1st stage, vidyagiri chandra layout, Sir m vishweshwaraiah layout 9th block, bhavani nagar 2nd stage, nrupathunga nagara, janapriya layout, vaddarahalli BMTC training centre, kittanahalli, bande maramma, kengunte circle, gidadakonenahalli, muddinapalya, thippagondanahalli quarters, tavarekere, doddabasti, vigneshwara nagara, annapoorneshwari nagar, thunganagara, yale kodegihalli, gollarahatti, kadabagere, bangalore university ADM block, KHB colony, KG lakkenahalli, Bylakonehalli, seegehalli, Giddadapalya, Aralimaradapalya, Huluvenahalli, sulivara, sugganahalli, sripathihalli, hunnigere, mantanakurchi, RMC yard, giddenahalli, gangenahalli, jogerahalli, lakshmipura, kanuvanhalli, kothaganahalli, maruthi markandeyanagara, Nagarahole nagara, andhrahalli, ravuthanahalli, biskur, savandurga, manchenahalli, chikka maskal, laggere, byadarahalli, brahma devara gudda, chikka kodigehalli, kannalli, baleveerahalli, heligeehalli colony, karikallu, upkar residency, chikkanahalli, karekalpalya, MAGADI, BEML 5th stage, Marathahalli bridge, Kadugodi, J.P.nagar 6th phase, J.P.nagar 3rd phase, Manganahalli, Nayandahalli railway gate, kempegowda bus station, kengeri ttmc, chowdeshwarinagara jp park, jayanagar 4th block TTMC, yelahanka, ITPL, Jalahalli cross, Ramasandra, Srinivasapura, Global academy bangarappa nagara, Bharath housing building co-operative society, Chikkalsandra Bus stand, Chennamana kere acchukattu, BHEL layout, Attibele, Shankarnag bus stop, Kamalanagar BEML Layout, Bommanahalli, Banashankari TTMC, Devasandra, Rajni Farm, srigandha nagara, CPWD Quarters, Electronic City, Shettyhalli, Sheshadri Nagara, Thammenahalli, Kirloskar Badavane, Pillahalli, Jayanagar 9th Block, Madhure, Peenya, Hesaraghatta, Chikkabanavara, Thammenahalli Palya, Basaveshwar Nagar, KIA,
12	Vijaynagar	RTO ullalu, kengeri satellite town, BGS Hospital, Ladies hostel university campus, Sports authority of india, Mysore road satellite bus station, Chandra layout, GKW layout, BCC Layout, Hampinagara, Yeshwanthpura TTMC, manorayanapalya, Shampura, K Narayanapura, Kaval Byrasandra, Sulthanpalya, Ganganagara, Malleshwaram 18th cross, Nagarabhavi BDA complex, Saraswathinagara, Nagarabhavi 1st stage 3rd block, Vijaynagar TTMC, Amma ashrama, ullala satellite town, Narasapura, machohalli, Nelamangala, Chikkanahalli, maruthinagara, sulikere, ITI layout, Chandra layout 1st stage, vidyagiri chandra layout, Sir m vishweshwaraiah layout 9th block, Bhavani nagar 2nd stage, Nrupathunga nagara, Bande maramma, kengunte circle, Doddabasti, Annapoorneshwari nagar, Bangalore university ADM block, upkar residency, BEML Layout 5th stage, Kadugodi, J.P.nagar 6th phase, J.P.nagar 3rd phase, Manganahalli, kengeri ttmc, Chowdeshwarinagara jp park, jayanagar 4th block TTMC, yelahanka, ITPL, Jalahalli cross, Ramasandra, Srinivasapura, Global academy bangarappa nagara, Bharath housing building co-operative society, Chikkallasandra Bus stand, Chennammana kere acchukattu, BHEL layout, Attibele, Shankarnag bus stop, Kamalanagar BEML Layout, Bommanahalli, Banashankari TTMC, Devasandra, Rajni Farm, Karmibsab Layout, CPWD Quarters, Electronic City, Shettyhalli, Sheshadri Nagara, Thammenahalli, Kirloskar Badavane, Pillahalli, Jayanagar 9th Block, Madhure, Electronic City 2nd Phase, Marenahalli, Bharath Nagar 2nd Phase, Peenya, Hebbala, KIA, Nagarbhavi Village, Chikkabanavara, Hesaraghatta, Shanthinagar TTMC, Basaveshwara Nagar, Panchasheela Nagara, Byadrahalli, Jnana jyothi nagara, Sunkadakatte, Kottigepalya, Thimmenahalli palya

ANNEXURE - 4
Details of Last mile destinations

Sl.no	Metro Station	Last mile Destinations
13	Attiguppe	RTO ullalu, kengeri satellite town, BGS Hospital, Mysore road satellite bus station, chandra layout, GKW layout, BCC Layout, Hampinagara, R.P.C. Layout, Yeshwanthpura TTMC, manorayanapalya, K Narayanapura, Kaval Byrasandra, Sulthanpalya, Malleshwaram 18th cross, Nagarabhavi BDA complex, Saraswathinagara, Nagarabhavi 1st stage 3rd block, Vijaynagar TTMC, amma ashrama, machohalli, Nelamangala, ITI layout, chandra layout 1st stage, vidyagiri chandra layout, nrupathunga nagara, bande maramma, kengunte circle, annapoorneshwari nagar, bangalore university ADM block, upkar residency, BEML 5th stage, Kadugodi, J.P.nagar 6th phase, J.P.nagar 3rd phase, Nayandahalli railway gate, chowdeshwarinagara jp park, jayanagar 4th block TTMC, yelahanka, ITPL, Jalahalli cross, Srinivasapura, Global academy bangarappa nagara, Bharath housing building co-operative society, Chikkalsandra Bus stand, Chennammana kere acchukattu, BHEL layout, Attibele, Shankarnag bus stop, Kamalanagar BEML Layout, Bommanahalli, Banashankari TTMC, Devasandra, Rajni Farm, Karimsab Layout, CPWD Quarters, Electronic City, Shettyhalli, Sheshadri Nagara, Thammenahalli, Kirloskar Badavane, Pillahalli, Jayanagar 9th Block, Madhure, Electronic City 2nd Phase, Marenahalli, Bharath Nagar 2nd Phase, Peenya, Hebbala, KIA, Nagarbhavi Village, Chikkabanavara, Hesaraghatta, Shanthinagar TTMC, Basaveshwar Nagar, BTM Layout, Jaibheema Nagar, Koramangala, Jeevanbheema Nagar, CV Raman Nagar, Electronic City WIPRO Gate, Panchasheela Nagara, Jnana Jyothi Nagara, Vijay Nagar, Kottigepalya, Sunkadakatte, Thammenahalli Palya,
14	Deepanjali nagar	BEML 5th stage, Srinivasapura, BHEL layout, ramasandra, shanthinagar TTMC, koramangala, talaguppe, parasanapalya, devagere, doddipalya, kambipura, karabele, varahasandra, BGS health city, kariyanapalya, channasandra, BHEL layout maramma temple, dhana nayakanahalli, gulganjahalli, bettanapalya, hakki pikki palya, thimmanapalya, manchanabele, anchipura colony, bidadi, billa kempanahalli, shanamangala, vajarahalli, karenahalli, doddabele, BHEL concord layout, bangarappa nagara, vishweshwaraiah layout 1st stage, kengeri bandemata badavane, kommaghatta, channegowdana doddi, hampapura, mukthinaga temple, malligindanahalli, punugumaranahalli, Doddamaranahalli, giriyappanapalya, subbarayanapalya, beemanakuppe, byrohalli, kenchanapalya, Thittahalli, Dodda kuntanahalli, Gaviyana palya, kaggalipura, Chikka kuntanahalli, kenchanaguppe, thoredoddi, manchegowdanapalya, annahalli, thirumalapura, gadigaiahana doddi, melehalli, dabbaguli, averahalli, basamammanahalli, kurubarapalya, alammanapalya, CK Thandya, gonipura, thippuru, mayasandra, hagalahalli, ramohalli, madapatna, hunnigere, Gollahalli, M gopahalli, katammanadoddi, uddanahalli, bylalu janatha colony, chandrappa circle, veeregowdana doddi, Devalingaiahana palya, srinivaspura, k.gollahalli, Guddadahalli dinne, bethimgere, muthurayanagudi palya, kempaiahanapalya, manganahalli, upadyaya badavane, police quarters, hunsemarada playa, byramangala, K.R.Market, AGS Layout, papareddy palya, Ambedkar college, Ganakkal, kempadyapanahalli, avaragere, bannikuppe, Kakamaranahalli, Doddabasti, Sulikere, Ullalaa satellite town, Tavarekere, Nelamangala, Chikkanahalli, Huluvenahalli, Magadi, Sugganahalli, electonic city, jayanagar TTMC, Vijaynagar, Central silk board, Kadugodi, ITPL, Yeshwanthpura TTMC, Ullalu upanagara, Bharathnagar 2nd phase, Banashankari TTMC, Kengeri TTMC, Shirke Apartments, Kengeri Satellite Town, Mysore Road Satellite Bus Station, RR Temple, machohalli, nelamangala, chandra layout 1st stage, jalahalli cross, bande maramma, vijaynagar ttmc, annapoorneshwari nagar, bangalore university ADM block, nagarbhavi BDA complex, GKW layout, saraswathi nagar, BCC layout, BEML 5th stage, Jnanajyothi nagara, nagarbhavi village, panchasheelanagar, jayanagar 9th block, nayandahalli railwaygate, CPWD quarters, CV Raman nagara, basaveshwara nagara, hebbala, KIA, Kanasawadi Mudhure Temple, sheshadri nagara, kirloskar badavane, thammenahalli, thammenahalli palya, shettihalli, peenya satellite bus stand, pillahalli, rajagopalnagar rajni farm, karimsab layout, chikkabanavara, hesaraghatta village, marenahalli, sunkadakatte, Global Academy, CK Acchukattu, BHCS Layout, Chikkalsandra, Hampinagar RPC Layout, Shankarnag Bus Stop, BEL Layout, Jeevanbheema Nagar, ELC WIPRO Gate, Electronic City 2nd Phae, Attibele, Jaibheema Nagar, Bommanahalli, BTM Layout, JP Park, Devasandra, Kaval Byrasandra, K Narayanapura, Yelahanka, Malleshwaram 18th Cross, Kottigepalya, Bande Maramma Bus Station.
15	Mysore road	BEML 5th stage, Srinivasapura, BHEL layout, ramasandra, shanthinagar TTMC, koramangala, talaguppe, parasanapalya, devagere, doddipalya, kambipura, karabele, varahasandra, BGS health city, kariyanapalya, channasandra, BHEL layout maramma temple, dhana nayakanahalli, gulganjahalli, bettanapalya, hakki pikki palya, thimmanapalya, manchanabele, anchipura colony, bidadi, billa kempanahalli, shanamangala, vajarahalli, karenahalli, doddabele, BHEL concord layout, bangarappa nagara, vishweshwaraiah layout 1st stage, kengeri bandemata badavane, kommaghatta, channegowdana doddi, hampapura, mukthinaga temple, malligindanahalli, punugumaranahalli, Doddamaranahalli, giriyappanapalya, subbarayanapalya, beemanakuppe, byrohalli, kenchanapalya, Thittahalli, Dodda kuntanahalli, Gaviyana palya, kaggalipura, Chikka kuntanahalli, kenchanaguppe, thoredoddi, manchegowdanapalya, annahalli, thirumalapura, gadigaiahana doddi, melehalli, dabbaguli, averahalli, basamammanahalli, kurubarapalya, alammanapalya, CK Thandya, gonipura, thippuru, mayasandra, hagalahalli, ramohalli, madapatna, hunnigere, Gollahalli, M gopahalli, katammanadoddi, uddanahalli, bylalu janatha colony, chandrappa circle, veeregowdana doddi, Devalingaiahana palya, srinivaspura, k.gollahalli, Guddadahalli dinne, bethimgere, muthurayanagudi palya, kempaiahanapalya, manganahalli, upadyaya badavane, police quarters, hunsemarada playa, byramangala, K.R.Market, AGS Layout, papareddy palya, Ambedkar college, Ganakkal, kempadyapanahalli, avaragere, bannikuppe, Kakamaranahalli, Doddabasti, Sulikere, Ullalaa satellite town, Tavarekere, Nelamangala, Chikkanahalli, Huluvenahalli, Magadi, Sugganahalli, electonic city, Vijaynagar, Central silk board, Kadugodi, ITPL, Hebbala, Yeshwanthpura TTMC, Ullalu upanagara, Bharathnagar 2nd phase, Banashankari TTMC, Shirke Apartments, Kengeri Satellite Town, Agara, Mysore Road Satellite Bus Station, RR Temple, Hebbala Bridge, jayanagar TTMC, Kengeri TTMC, Shankarnag Bus stop, Chowdeshwari Nagar JP Park, Devasandra Chikkamaranahalli, Yelahanka, Electronic city WIPRO Gate, Thammenahalli, Hampinagar Bus stand, Jeevanbheema Nagar, Chikkalsandra, Global Academy, Jalahalli Cross, Kottigepalya, Vijaynagar TTMC, Attibele, Bommanahalli, electonic city 2nd Phase,

Details of the wards directly accessible to metro services

Sl.no	Metro Station	Wards Covered	No of wards covered
1	Baiyappanahalli	51, 53, 54, 55, 56, 81, 27, 50, 57, 58, 80, 88, 112, 114, 148, 151, 152, 176, 150, 82, 83, 84, 52, 172, 26, 25,	26
2	Swami vivekananda	51, 53, 54, 55, 56, 81, 27, 50, 57, 58, 80, 88, 112, 114, 148, 151, 152, 176, 150, 82, 83, 84, 52, 172, 26, 25	26
3	Indiranagar	81, 87, 24, 27, 28, 29, 59, 50, 57, 58, 79, 80, 88, 112, 114, 156, 162, 163, 161, 165, 166, 180, 181, 182, 148, 151, 152, 176, 179, 150, 175, 189, 190, 191, 192, 183, 177, 172, 25,	39
4	Halasuru	51, 53, 54, 55, 56, 81, 87, 24, 27, 28, 29, 59, 50, 57, 58, 79, 80, 88, 90, 112, 114, 89, 156, 162, 163, 161, 165, 166, 180, 181, 182, 148, 151, 152, 176, 179, 150, 82, 83, 84, 175, 189, 190, 191, 192, 52, 183, 177, 172, 26, 25,	51
5	Trinity circle	51, 53, 54, 55, 56, 81, 87, 24, 27, 28, 29, 59, 113, 50, 57, 58, 79, 80, 88, 90, 111, 112, 114, 89, 156, 162, 163, 161, 165, 166, 180, 181, 182, 148, 151, 152, 176, 179, 149, 150, 82, 83, 84, 85, 175, 189, 190, 191, 192, 52, 183, 177, 172, 26, 25, 86,	56
6	M G road	4, 51, 53, 54, 55, 56, 81, 87, 5, 7, 8, 35, 45, 64, 65, 20, 21, 34, 78, 24, 27, 28, 29, 59, 113, 50, 57, 58, 79, 80, 88, 110, 63, 90, 91, 93, 111, 112, 114, 115, 117, 89, 77, 94, 118, 144, 145, 153, 156, 162, 163, 161, 165, 166, 180, 181, 182, 146, 147, 148, 151, 152, 173, 176, 179, 149, 150, 82, 83, 84, 85, 174, 175, 187, 188, 189, 190, 191, 193, 192, 194, 1, 52, 170, 183, 177, 172, 26, 25, 86,	90
7	Cubbon park	3, 4, 54, 5, 6, 7, 8, 160, 38, 42, 69, 41, 102, 43, 44, 67, 68, 74, 75, 35, 45, 65, 66, 76, 20, 21, 33, 34, 46, 31, 32, 47, 48, 60, 61, 78, 23, 24, 27, 28, 29, 30, 49, 59, 50, 110, 63, 91, 93, 111, 114, 117, 77, 94, 95, 100, 101, 107, 108, 97, 98, 99, 105, 106, 157, 158, 135, 136, 137, 138, 139, 140, 118, 119, 142, 143, 144, 145, 153, 155, 156, 154, 162, 163, 164, 161, 165, 166, 167, 180, 181, 182, 146, 147, 148, 151, 152, 178, 173, 176, 168, 169, 179, 150, 174, 175, 186, 187, 188, 189, 190, 191, 184, 185, 192, 194, 195, 196, 1, 170, 183, 197, 177, 172, 26, 25, 198,	127
8	Dr.B.R Ambedkar vidhansoudha	51, 53, 54, 55, 5, 6, 35, 20, 21, 22, 33, 34, 46, 31, 32, 47, 60, 61, 78, 23, 24, 27, 28, 29, 30, 49, 59, 50, 79, 110, 62, 63, 90, 91, 92, 93, 109, 94, 95, 134, 157, 135, 136, 137, 138, 139, 140, 141, 118, 119, 142, 143, 153, 154, 165, 166, 167, 180, 181, 182, 168, 179, 184, 1, 52, 197, 26, 25,	68
9	City railway station	54, 87, 130, 40, 72, 160, 38, 42, 69, 73, 14, 15, 39, 41, 70, 71, 102, 43, 44, 67, 68, 74, 75, 35, 45, 65, 66, 113, 110, 111, 112, 114, 117, 109, 120, 121, 77, 94, 95, 96, 100, 101, 107, 108, 98, 99, 103, 104, 105, 106, 125, 126, 127, 128, 131, 122, 123, 124, 132, 133, 158, 138, 140, 141, 119, 142, 143, 153, 154, 167, 178, 168, 169, 179, 149, 150, 82, 83, 84, 85, 129, 170, 177, 86,	84
10	Magadi road	54, 87, 5, 6, 7, 8, 130, 159, 40, 72, 160, 17, 37, 38, 42, 69, 73, 14, 15, 39, 41, 70, 71, 102, 43, 44, 67, 68, 74, 75, 35, 36, 45, 64, 65, 66, 76, 20, 21, 22, 33, 34, 46, 31, 32, 47, 48, 23, 113, 110, 111, 112, 114, 117, 109, 120, 121, 77, 94, 95, 96, 100, 101, 107, 108, 98, 99, 103, 104, 105, 106, 125, 126, 127, 128, 131, 122, 123, 124, 132, 133, 134, 157, 158, 138, 140, 141, 119, 142, 143, 153, 154, 167, 178, 168, 169, 179, 149, 150, 82, 83, 84, 85, 129, 170, 177, 25, 86, 198,	109
11	Hosahalli	3, 4, 54, 87, 10, 11, 5, 6, 7, 8, 9, 130, 159, 40, 72, 16, 160, 17, 37, 38, 42, 69, 73, 12, 13, 14, 15, 39, 41, 70, 71, 102, 43, 44, 67, 74, 75, 35, 36, 45, 64, 65, 66, 76, 18, 19, 20, 21, 22, 33, 34, 46, 31, 32, 47, 48, 23, 113, 110, 111, 112, 114, 117, 109, 120, 121, 77, 94, 95, 96, 100, 101, 107, 108, 98, 99, 103, 104, 105, 106, 125, 126, 127, 128, 131, 122, 123, 124, 132, 133, 134, 157, 158, 136, 138, 140, 141, 119, 142, 143, 153, 155, 156, 154, 162, 163, 164, 161, 165, 166, 167, 180, 181, 182, 146, 151, 152, 178, 173, 176, 168, 169, 179, 149, 150, 82, 83, 84, 85, 174, 175, 189, 190, 191, 184, 192, 1, 129, 170, 183, 197, 177, 172, 25, 86, 198,	146
12	Vijaynagar	3, 4, 54, 87, 10, 11, 5, 6, 7, 8, 9, 130, 159, 40, 72, 16, 160, 17, 37, 38, 42, 69, 73, 12, 13, 14, 15, 39, 41, 70, 71, 102, 43, 44, 67, 74, 75, 35, 36, 45, 64, 65, 66, 76, 18, 19, 20, 21, 22, 33, 34, 46, 31, 32, 47, 48, 23, 113, 110, 111, 112, 114, 117, 109, 120, 121, 77, 94, 95, 96, 100, 101, 107, 108, 98, 99, 103, 104, 105, 106, 125, 126, 127, 128, 131, 122, 123, 124, 132, 133, 134, 157, 158, 136, 138, 140, 141, 118, 119, 142, 143, 145, 153, 155, 156, 154, 162, 163, 164, 161, 165, 166, 167, 180, 181, 182, 146, 151, 152, 178, 173, 176, 168, 169, 179, 149, 150, 82, 83, 84, 85, 174, 175, 189, 190, 191, 184, 192, 1, 129, 170, 183, 197, 177, 172, 25, 86, 198,	148
13	Attiguppe	3, 4, 54, 87, 10, 11, 5, 6, 7, 8, 9, 130, 159, 40, 72, 16, 160, 17, 37, 38, 42, 69, 73, 12, 13, 14, 15, 39, 41, 70, 71, 102, 43, 44, 67, 74, 75, 35, 36, 45, 64, 65, 66, 76, 18, 19, 20, 21, 22, 33, 34, 46, 31, 32, 47, 48, 23, 113, 57, 58, 80, 88, 110, 90, 111, 112, 114, 117, 89, 109, 120, 121, 77, 94, 95, 96, 100, 101, 107, 108, 98, 99, 103, 104, 105, 106, 125, 126, 127, 128, 131, 122, 123, 124, 132, 133, 134, 157, 158, 136, 138, 139, 140, 141, 118, 119, 142, 143, 145, 153, 155, 156, 154, 162, 163, 164, 161, 165, 166, 167, 180, 181, 182, 146, 148, 151, 152, 178, 173, 176, 168, 169, 179, 149, 150, 82, 83, 84, 85, 174, 175, 189, 190, 191, 184, 192, 194, 196, 1, 129, 170, 183, 197, 177, 172, 25, 86, 198,	158

ANNEXURE - 5
Details of the wards directly accessible to metro services

Sl.no	Metro Station	Wards Covered	No of wards covered
14	Deepanjali nagar	3, 4, 54, 87, 10, 11, 5, 6, 7, 8, 9, 130, 159, 40, 72, 16, 160, 17, 38, 42, 69, 73, 12, 13, 14, 15, 39, 41, 70, 71, 102, 43, 44, 67, 74, 75, 35, 36, 45, 64, 65, 66, 76, 18, 19, 20, 21, 33, 34, 46, 32, 47, 113, 57, 58, 80, 88, 110, 90, 111, 112, 114, 117, 89, 109, 120, 121, 77, 94, 95, 96, 100, 101, 107, 108, 98, 99, 103, 104, 105, 106, 125, 126, 127, 128, 131, 122, 123, 124, 132, 133, 134, 157, 158, 136, 139, 140, 141, 118, 119, 142, 143, 145, 153, 155, 156, 154, 162, 163, 164, 161, 165, 166, 167, 180, 181, 182, 146, 147, 148, 151, 152, 178, 173, 176, 168, 169, 179, 149, 150, 82, 83, 84, 85, 174, 175, 186, 189, 190, 191, 184, 185, 192, 194, 196, 1, 129, 170, 183, 197, 177, 172, 25, 86, 198	155
15	Mysore road	3, 4, 54, 55, 56, 87, 10, 11, 6, 7, 8, 9, 130, 159, 72, 16, 160, 17, 38, 42, 69, 73, 14, 15, 39, 41, 70, 71, 102, 43, 44, 67, 74, 35, 36, 45, 66, 18, 19, 20, 21, 23, 24, 27, 29, 113, 50, 58, 80, 88, 110, 111, 112, 114, 117, 109, 120, 121, 94, 95, 96, 101, 107, 108, 99, 103, 104, 105, 106, 125, 126, 128, 131, 122, 123, 124, 132, 133, 134, 157, 158, 136, 139, 140, 141, 118, 119, 142, 143, 145, 153, 155, 156, 162, 163, 164, 161, 165, 166, 167, 180, 181, 182, 146, 147, 148, 151, 152, 178, 173, 176, 168, 179, 149, 150, 82, 83, 84, 85, 174, 175, 186, 189, 190, 191, 184, 185, 192, 194, 196, 1, 129, 183, 197, 177, 172, 25, 86, 198	139