



Gurugram Metropolitan City Bus Limited

Covering every corner of Gurugram

Implementation of City Bus Service Project in Gurugram – Bus Route Planning and Rationalization

Draft Final Report

November - 2017

A Joint Venture of The Government of National
Capital Territory of Delhi & The IDFC Foundation.
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List of Abbreviations

PT	Public Transport
IPT	Intermediate Public Transport
MCG	Municipal Corporation of Gurugram
GMDA	Gurugram Metropolitan Development Authority
EPK	Earnings Per KM
NCR	National Capital Region
DMRC	Delhi Metro Rail Corporation
NMT	Non-Motorized Transport
TAZ	Traffic Area Zone
GBS	Gurugram Bus Stand
INR	Indian Rupee
I – E, E- I, I – I	Internal to External , External to Internal , Internal to Internal
MRTS	Mass Rapid Transit System
MoUD	Ministry of Urban Development
LoS	Level of Service

CHAPTER 1

Introduction

1 Introduction

1.1 Background and Study Context

Gurugram is a city in the Indian state of Haryana and is part of the National Capital Region of India. It is 32 kilometres southwest of New Delhi. Gurugram Municipal Corporation area has an estimated population of 876,824 as per 2011 India census.

Gurugram has emerged as a prominent industrial, IT, BPO and commercial hub. Multinational companies, large business houses, foreign investors, Non-Resident Indians (NRI) are continuing to invest in Gurugram. Rapid urbanization, population growth, growing economy and emerging employment opportunities in the region have placed an enormous demand for quality in transport infrastructure. Gurugram has grown mainly along NH8.

Municipal Corporation of Gurugram intends to improve the public transport in Gurugram by developing adequate bus route system and rationalizing of para transit routes which is run by private operators. The department has requested Delhi Integrated Multi Modal Transit System (DIMTS) to conduct the bus route planning and rationalisation study covering the following services.

1. Planning of Bus Routes based on origin destination of users and connectivity of various city nodes
2. Rationalize the existing para transit services/routes and re-organize their operation so that city area is sufficiently covered by public transport network.

1.2 Objectives of the study

The objective of the study is to develop a bus route planning and rationalization plan considering:

- Movement patterns of the passengers in the city.
- Demand Levels
- Service Level Benchmarks
- Need for various type of services
- City Land use Integration
- Multimodal Integration
- Overlap services
- Efficiency of Existing operations

1.3 Scope of Work

As set out in the Terms of Reference (ToR), the scope of the study is:

Review of Secondary Data

- Review of existing public transport passenger flow movement
- Review of Existing route plan of city
 - Route structure of all routes with details of fare stage bus stops
 - Operational characteristics of the routes
 - Routes wise buses deployed during various period of time during the day
 - Review of existing stage carriage route plan for the city of Gurugram
- Review of existing Intermediate para transit services and rationalizing and re-organizing their operation.

- Review of financial performance of operating routes
- Identification of market segments
- Modification of existing routes according to market segmentation, passenger flow movement and financial performance
- Estimation of ridership on new routes

Field Data Collection – Traffic Surveys and inventory

The proposed field surveys are as under:

- Household Surveys
- User opinion survey
- Boarding / alighting survey
- Workplace survey
- Passenger count on para transit operators
- On-board passenger counts

Public Transport Data Analysis

The collected data will be analysed to determine:

- Passenger travel Patterns
- Major Demand nodes of city
- Travel demand along various corridors
- Connected and less connected areas of city
- Passenger trip lengths
- User opinion in service enhancement

Public Transport Modelling

The collected data will be coded and inputted in public transport system modelling software to determine various public transport route options. These route options will be evaluated based on travel demand loading and assess the fleet size and number of vehicles needed for meeting demand levels.

Planning Public Transport Routes

Based on modelling and data collected, new routes will be determined under various categories such as:

Public transport routes to connect various area of city

- Express and current public transport routes
- Feeder routes
- Need for special services such as AC / work centre based etc.

Route Rationalization, Planning and Clustering

Based on the data available on route alignment, overlap, length, connectivity etc. route rationalization of existing para transit services will be attempted to simplify the network and improve efficiency level. This will include

- Based on expected performance of routes, route clustering will be done to determine
- Routes for mainline public transport
- Routes for smaller vehicles / feeders
- Route clustering determining private sector potential

Service Planning

Based on the Demand Levels, peak frequency, off-peak frequency, fleet size, vehicle size etc. will be recommended for each route.

1.4 Structure of the Draft Final Report

This report is organised in following chapters

Chapter 1	Introduction
Chapter 2	Project Area Description
Chapter 3	Data Collection & Analysis
Chapter 4	Service Level Benchmarking of the city bus services
Chapter 5	Recommendations on Bus Route Planning & Rationalization
Chapter 6	Recommended routes for Horizon year - 2037
Chapter 7	Recommended Route Wise Bus Stop Details
Chapter 8	Proposal for Bus Route Numbering
Annexure 1	Phase 1A bus stop details with X and Y coordinates

CHAPTER 2

Project Area Description

2 Project Area Description

2.1 Introduction to city

The study area, Gurugram is located in Central National Capital Region of Delhi. It falls between southwest boundary of Delhi UT and North-East Boundary of Rajasthan State. It is a part of Haryana State and is surrounded by other major cities of Haryana like, Faridabad in east, Jhajjar in west and by Nuh, Rajasthan in South.

Gurugram district has witnessed a phenomenal growth in all spheres of developments, particularly in industry and urbanization. Gurugram is one of fastest growing business districts in the National Capital Region (NCR). Being in the proximity of Delhi, there is an exponential growth in traffic between Delhi and Gurugram during the last few years. Today, it has become a hub of multinational companies, industries giants, call centres, software companies, shopping malls and skyscrapers. Gurugram is strategically located with its boundaries touching Rajasthan, Uttar Pradesh and Delhi.

Its excellent connectivity with other state via Delhi-Jaipur –Ahmedabad broad gauge rail link and NH 8, brings thousands of people to Gurugram for the purpose of work travel and entertainment. In fact, with the collaboration of Suzuki Motors of Japan and Maruti Udyog Limited in early eighties, a new area of rapid industrialization of Gurugram started as a result of which the city came on the international map. The automobile industry of Gurugram is producing passenger cars, motor cycles, scooters and its components. There are many prominent and prestigious units involved in the manufacturing of telecommunication equipment's, electrical goods, sports goods, rubber products and readymade garments, and in software development.

Other industries include light engineering goods, pharmaceuticals, agro based and foods processing, leather, towels, air conditioners, shoes, pesticides , insecticides, etc. the main industries in these fields are Cisco, Enkay Rubber, Perfetti, Haldiram, HFCL, Martin Haris, Ranbaxy Laboratories etc.

2.2 Project Area Delineation

While delineating the project area, consultant has considered the city boundaries of Gurugram and the nearby areas outside the city boundary such Manesar. While doing project area delineation, the consultant has also considered the areas of Gurugram Metropolitan Development Authority which includes following areas and jurisdiction.

- The Municipal Corporation, Gurugram
- The Municipal Council, Sohna
- The Municipal Committee, Pataudi;
- The Municipal Committee, Farrukh nagar;
- The Municipal Committee, Hailey Mandi; and
- Any Panchayat in Gurugram district in so far as the abadi of such Panchayat is concerned;

Consultant, during surveys also studied the trip interactions between Gurugram, Sohna, Farrukh nagar, Pataudi and Hailey Mandi. The map showing the project area is given below:

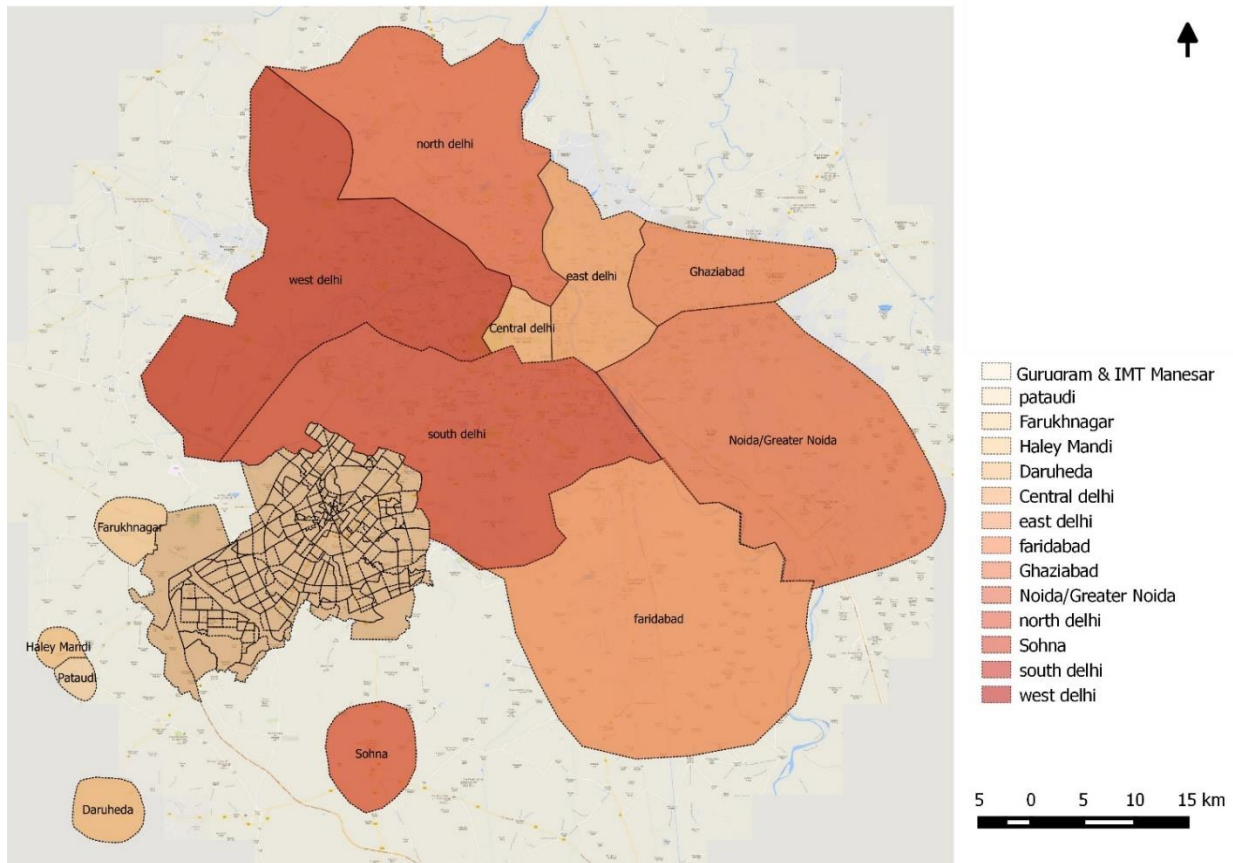


Figure 2-1 Study Area for Bus Route Planning and Route Rationalization of Gurugram

2.3 Transport Network & System

Road Connectivity

Gurugram is very well connected with roads both within Intracity and Intercity. It is connected by Gurugram expressway with Delhi. The other systems that are available which connects Gurugram with Delhi are Public transport system which includes both Bus and Mass Rapid Transit system (Delhi Metro). Delhi Metro Yellow line gives access to Gurugram. Around five stations of the yellow line are located within Gurugram city limits.

Rail connectivity

Gurugram has a Railway station which is on the line of Delhi – Jaipur. It is one of the major stations catering to Gurugram, Delhi and other parts of Gurugram district.

Air Connectivity

Gurugram is served by Indira Gandhi International Airport, though the airport is just outside the city limits and located within the jurisdiction of Delhi near National Highway 8. The airport is one of the busiest airports in India and provides domestic and international air connectivity.

2.4 Demographic Profile

For the efficient management of the Gurugram city Gurugram Municipal Corporation is established. The area of the Gurugram Municipal Corporation is 198 square kilometres. Gurugram is governed Gurugram Municipal Corporation. For easy administration, The

Gurugram Municipal Corporation area has 115 sectors which have been clubbed together to form 35 wards for municipal operations.

The city of Gurugram has grown leaps and bounds due to the various developments. These developments have played a crucial role in altering the demographic situation of the city. The demographic changes include the sharp increase in the population numbers thus, taking a numeric turn as well the cultural turn in the population of the city. The town of Gurugram has evolved in a city with the series of changes and dynamics in demography. As per 2011 census the population of Gurugram is 8,76,969. Gurugram has seen a huge leap in the decadal growth rate it is noticed to have 315.47% decadal growth rate (2001- 2011). The sex ratio is 854 females for 1000 males. The literacy rate is around 84.7%. The detail of demographics for last two decades has been provided in the following table.

Table 2-1 Population details of Gurugram

Year	Population	Decadal Change	Decadal GR (%)	Sex ratio (per 1000 male)	Literacy rate
1991	128253				
2001	211079	82826	64.58%	850	78.5%
2011	876969	665890	315.47%	854	84.7%

Source: Census of India

2.5 Transport System in Gurugram

2.5.1 Mass Rapid Transport System in Gurugram (Delhi Metro)

Existing Metro Routes: The Gurugram is connected to Delhi Metro through yellow line. The yellow line of DMRC connect HUDA City Centre in city of Gurugram. Total 6 stations in Gurugram are covered by yellow line which are Arjun Garh, Garden Estate, Sikanderpur, MG road, IFFCO chowk and Huda City Centre. As per the published sources of DMRC, the average daily ridership of Yellow line in year 2015 was 8,31,258. For Huda City Centre metro Station the daily ridership was 42,989, for IFFCO chowk metro station the daily ridership was 21,837 and for MG road metro station the daily ridership was 33,792.



Figure 2-2 Gurugram DMRC Metro Route

Proposed Metro Routes: Delhi Metro Rail Corporation also has future proposals for connecting Gurugram with Delhi. The proposed routes are as follows:

- **Airport Express Line – Dwarka Sector 21 – IFFCO Chowk metro station:** In this route, DMRC has proposal of extending Airport Express line to IFFCO Chowk via Dwarka Sector 21. The Proposed Metro alignment is as shown below
- **Centre to Sector 47 of Gurugram.** The Proposed Metro alignment is as shown below

2.5.2 Rapid Metro, Gurugram

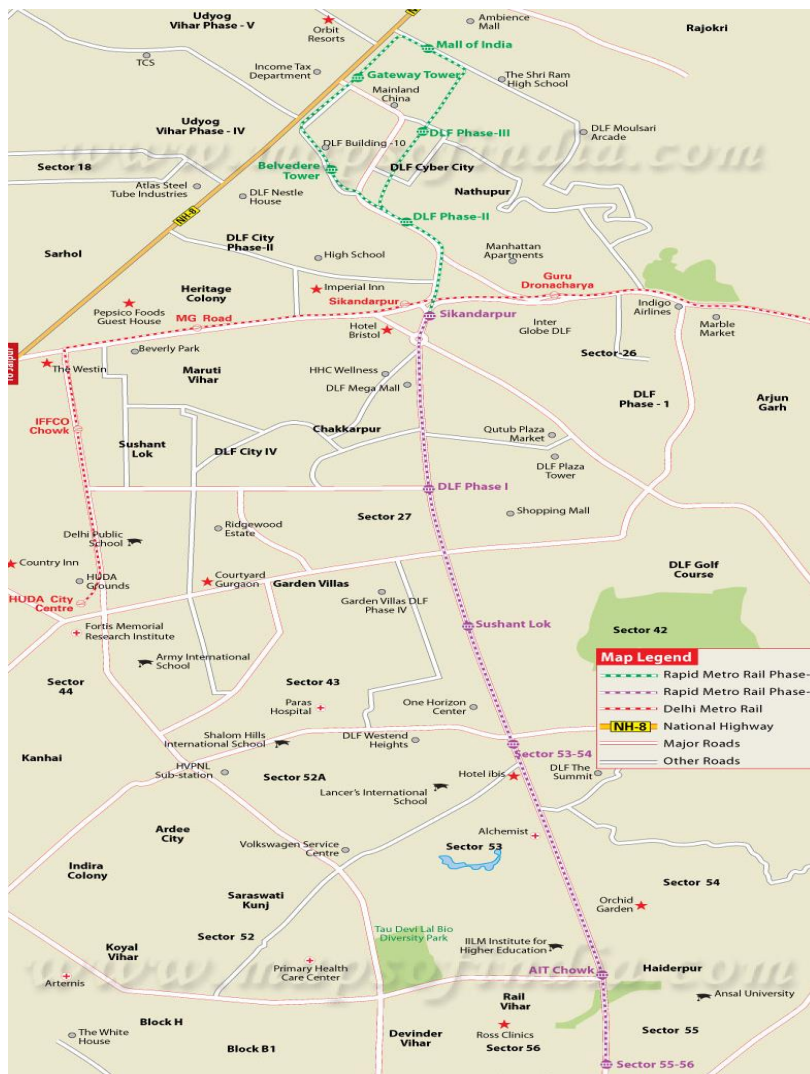
The Gurugram metro rail system was planned earlier in 2009 and the foundation stone was laid on August 11, 2009. But the plan came into action in 2010 and Rapid Metro Phase-I was completed at the cost of Rs 1,100 crore. The construction of phase-II was started in 2013 and completed at the cost of 2,400 crore. The phase-II was opened to public on 31st March 2017 and five new stations were added.

There are 11 stations in total, namely Sikanderpur, DLF Phase II, Belvedere Towers, Gateway Tower, Mousari Avenue, DLF Phase III, DLF Phase-I, Sushant Lok, Sector 53-54, AIT Chowk and Sector 55-56. The rapid metro phase 1 and 2 is shown in map below:

Essential details of Rapid Metro

- Each train has 3 coaches, having a width of 2.8 m and 4 doors on each side.
- It is blue and silver in colour.
- Each train is 59.94 m long.
- First train runs at 6:05 in the morning from Sikanderpur.
- Frequency: 3 to 4 minutes
- The train completes the loop of 5.1 km in 13 minutes.
- Each train can carry approximately 800 passengers.
- The train runs at the maximum speed of 80 km/h and an average speed of 30 km/h.
- A commuter is charged INR 12.
- It connects to Delhi Metro through a skywalk built at Sikanderpur station.

Rapid metro routes (phase 1 and 2)



2.5.3 Shuttle (Private App based Bus Service)

There is some private sector initiatives have also come up recently in providing public transport services in city. One of such service is Shuttle.

- Shuttle introduced in 2015, due to issues with a nascent public transport system that has struggled to cope with Delhi's growing population of city, Shuttle is an app based, office bus service that allows its customers to book transport using Shuttle's vehicles, from their mobile phone.
- With over 1 million rides taken in the first year, Shuttle partnered with Chirp to reduce congestion, pollution and guarantee passenger seats and arrival times. App is connecting offices in Gurugram & Noida to homes in Delhi-NCR. Average Daily ridership.
- As per company's website, approximately 35,000 people use this service daily.

The route map of Delhi- NCR is as shown below:

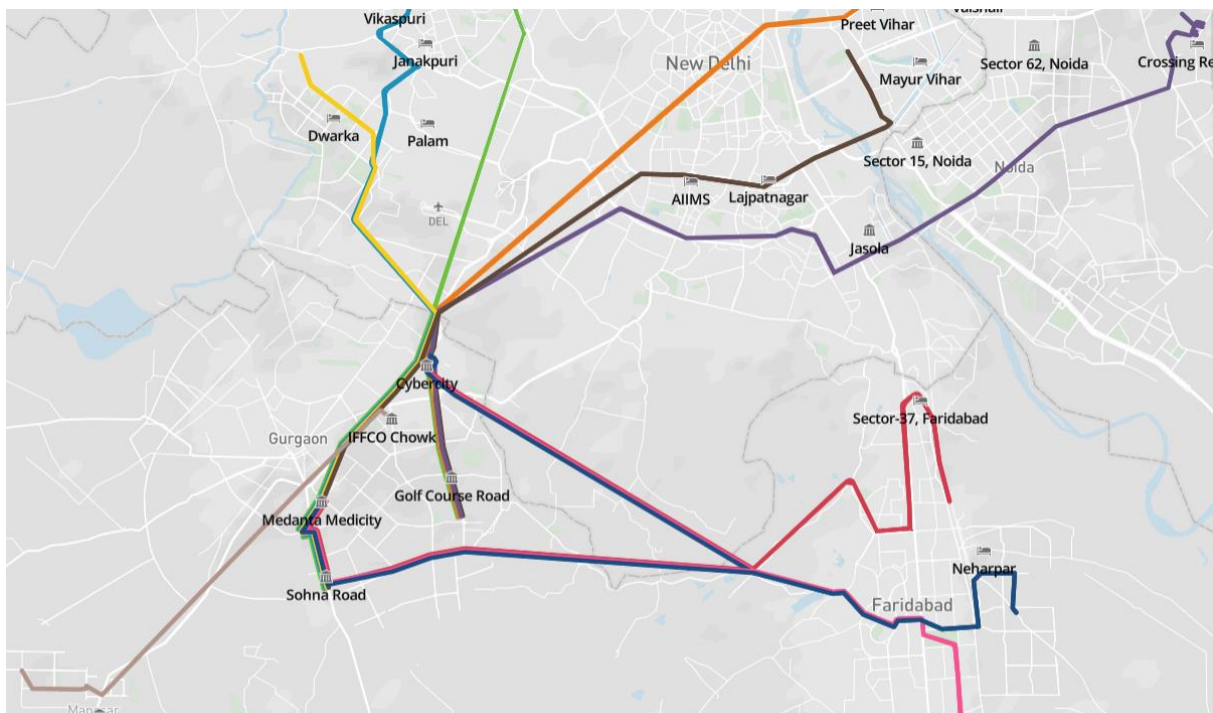


Figure 2-3 Route Map for Shuttle Bus Service

2.5.4 Intermediate Public Transport (IPT) of Gurugram city

IPTs are preferred over public bus system in city due to better availability, connectivity, frequency and low pricing. The average route length for IPT is more than that of public transport which depicts the dependence of users on IPT. These modes operate on major hubs like metro stations, IFFCO chowk, Bus Stand and Rajiv Chowk.

- Residents do not fully rely on the Delhi Metro because of overcrowding and limited connectivity. The private players have come up with these unregulated modes such as bolero, private taxis and Tata magic which frequently ferry passengers.
- Bolero, Tata magic operate on Manesar – MG road, IFFCO chowk route in absence of frequent bus service towards Manesar. Connectivity in residential sectors of 29,45,56 etc are dominated by auto and manual rickshaw
- E-rickshaw have route functioning from metro stations to various areas.
- Metro Feeder service from bus stand to Sector 55-56 is available.

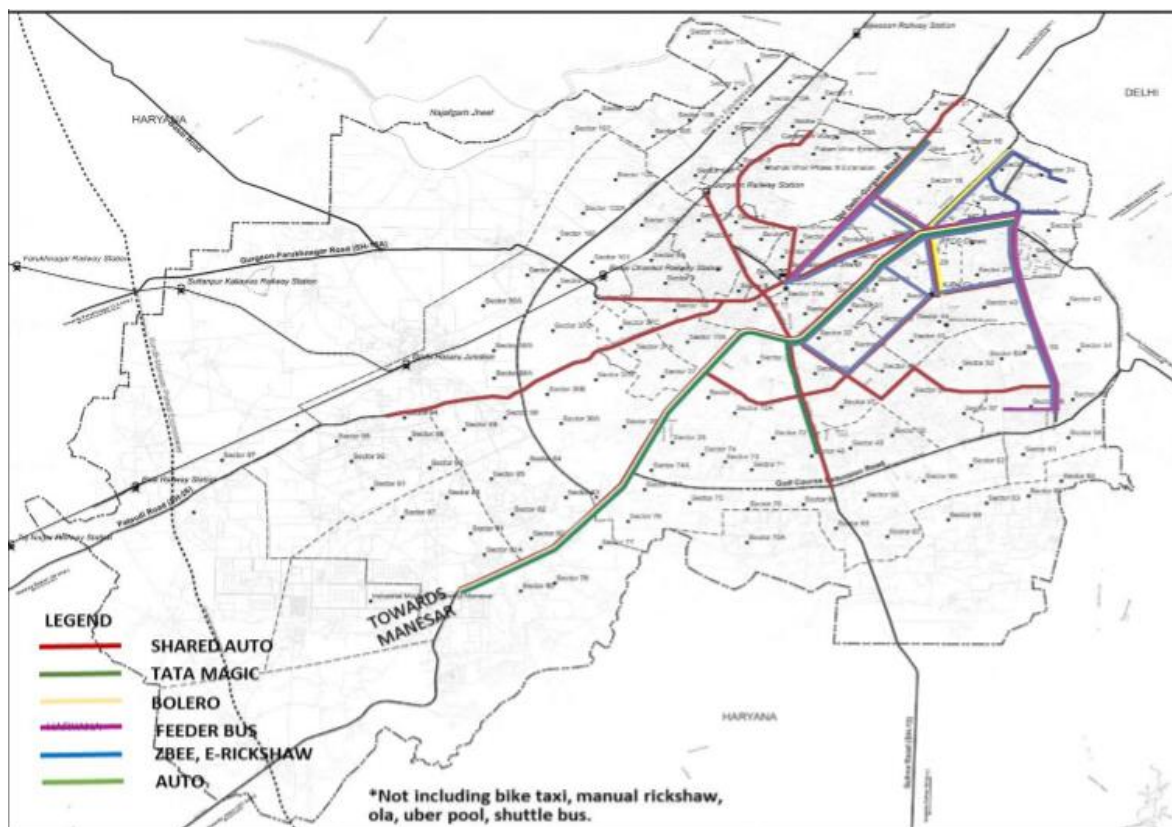


Figure 2-4 IPT Route Map for Different Modes

2.5.5 Proposed RRTS by National Capital Regional Transport Corporation

National Capital Region Planning Board (NCRPB) & NCRTC on the basis of “Integrated Transportation Plan for NCR” identified eight Regional Rapid Transit System (RRTS) corridors to enhance the efficiency of the transportation system in the NCR in addition to other facilities including road network enhancements.

The eight identified RRTS corridors are:

- Delhi – Gurugram – Rewari – Alwar (180 Kms) [DGRA - Project Corridor]
- Delhi – Ghaziabad – Meerut (90 Kms)
- Delhi – Sonapat – Panipat (111 Kms)
- Delhi – Faridabad – Ballabgarh – Palwal (60kms)
- Delhi – Bahadurgarh – Rohtak (70 Kms)
- Delhi – Shahadra – Baraut (56 Kms)
- Ghaziabad – Khurja (83 Kms)
- Ghaziabad – Hapur (57 Kms)

For Gurugram Region, Delhi – Gurugram – Rewari – Alwar rail rapid transit system has been identified. From Delhi to Alwar, the total length of alignment of RRTS is 180 km. The proposed route alignment will be New Delhi-Kishanganj-Kirti Nagar-Delhi cant -Bijwasan-Cyber City-Rajiv Chowk-Patli-Pataudi-Rewari-Bawal-SNB-Khairthal-Alwar. The proposed route alignment for this corridor is shown below:

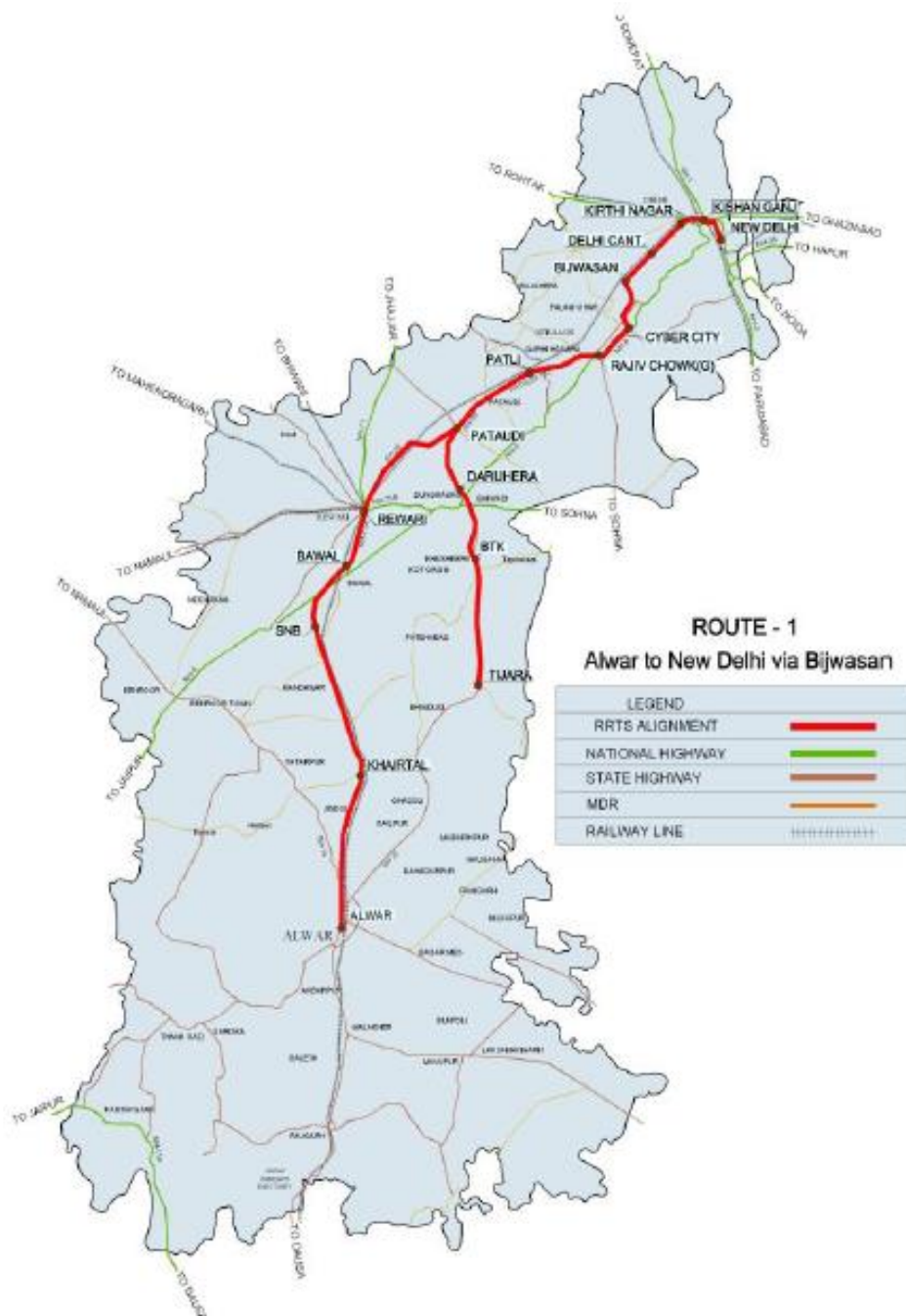


Figure 2-5 Proposed Route Alignment for RRTS

2.6 Transport Issues in Gurugram

The important transport characteristics and issues in Gurugram that leads to traffic problems and inefficient mobility of people are the following:

Public Transport

- Gurugram lack proper organized public transport for local/intra -city transport.
- IPT is a main mode of transport which causes congestion pollution, safety issues and provide poor level of service to city residents
- The operations of auto rickshaws are not organized and lack designated locations for parking and stopping.

Road Infrastructure

- Most of roads in Gurugram experience heavy traffic congestion
- Unorganized and haphazard parking and encroachment on roads leads to reduction in road capacity.
- Water logging is acute on roads.
- Proper marking and signage are absent on many roads.

Non-Motorized Transport Facilities

- The high share of non- motorized vehicles (NMVs) on Gurugram roads
- No separate lanes available for NMVs which forces them to share the main stream and leads to unsafe traffic conditions on the roads
- Limited pedestrian crossing facility is available in city.
- Foot path is not available on many roads.
- Footpaths are also encroached by hawkers and vendors or with obstructions like transformers and trees.

Bus Terminals

- Interstate and local mini buses are operated from the bus terminal located in the heart of the city.
- The area available for the terminal is limited and entry and exit of the terminal are narrow.
- Access roads leading to the bus terminal are narrow and encroached by parkers, hawkers and shop keepers.

CHAPTER 3

Data collection and Analysis

3 Data collection and Analysis

3.1 Background

For planning of bus system, transport system of Gurugram has to be analyzed as a whole. Therefore, to analyze the existing public transport system, extensive surveys have been conducted covering public transport users, metro, bus, Intermediate Public Transport users to compile their travel characteristics and collect their feedback on existing services and suggestions to improve the services.

This chapter briefly discuss about the various studies that were conducted to build the database, feedback received from passengers and commuters and analysis of data thereof.

3.2 Zoning System

For analysis purpose, a suitable traffic zone system has been developed for the study area by taking into considerations of the census/village boundaries, physical barriers such as railway line, river and drain. The traffic analysis zones have formed such that they are homogeneous within themselves with respect to broad socio-economic characteristics. The zone centroid will be the generation and attraction node for a zone. All the trips within a zone will be entering and leaving the zone through the respective zone-centroid

For the better understanding of travel pattern within the study area the entire Gurugram Metropolitan Area have been considered for detailed zoning system. The study area has been divided into a system of 270 traffic zones and is designated as Traffic Analysis Zones (TAZ), consisting of 35 municipal wards zones, Municipal area of Sohna, Heli mandi, Pataudi, Farrukh nagar and areas other than Gurugram Metropolitan area like Delhi, Palwal etc. have been divided into 18 traffic zones and are considered as External Zones. The proposed traffic zoning system is presented below.

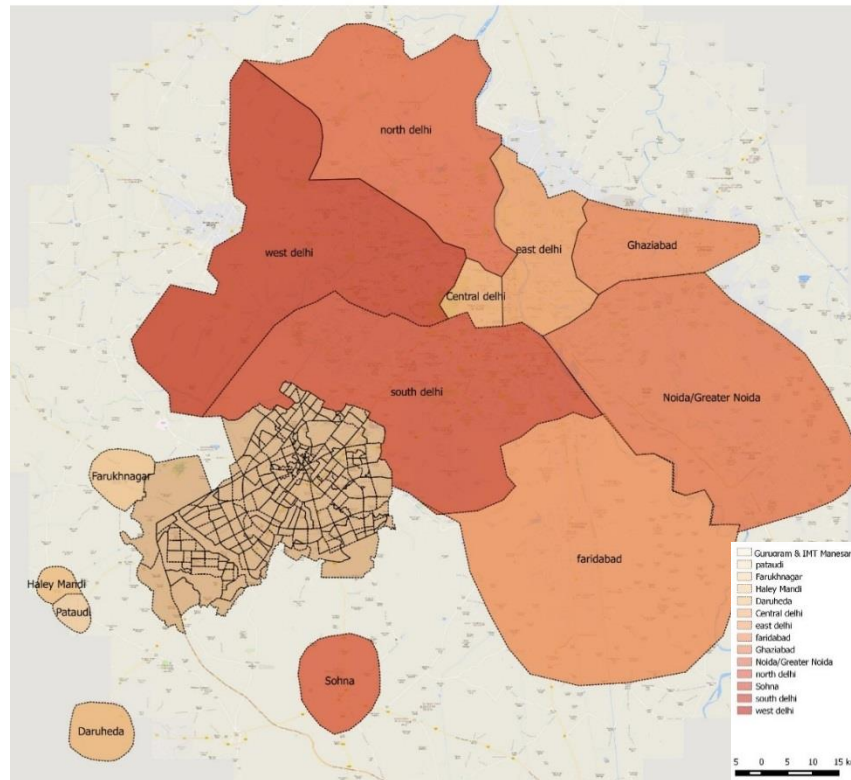


Figure 3-1: Overall Traffic Analysis Zones Map (both Internal and External Zones)

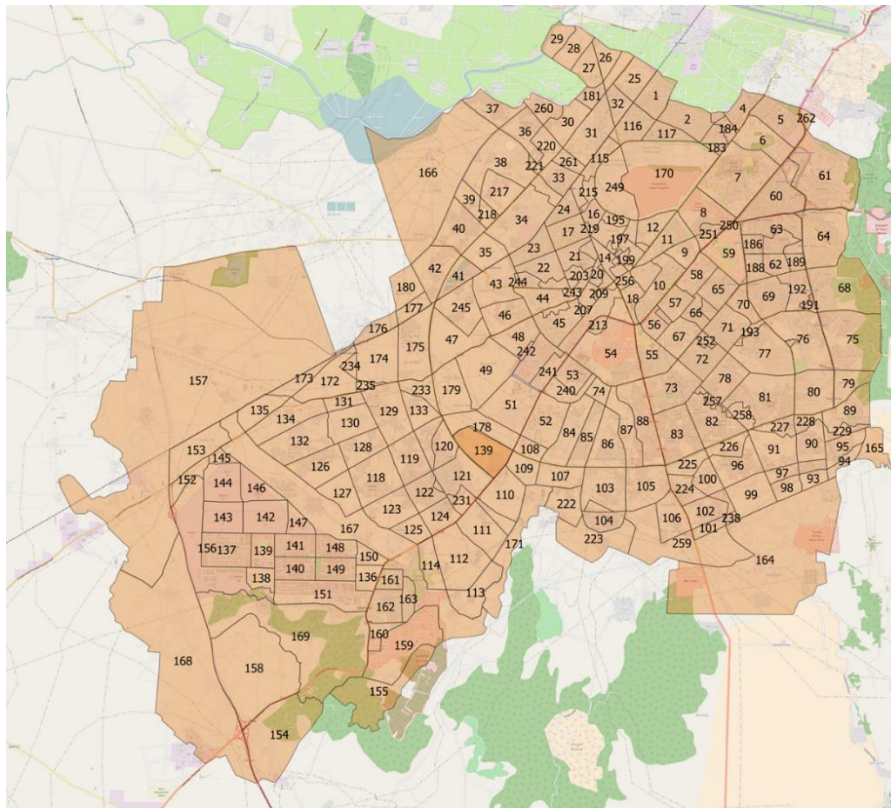


Figure 3-2: Traffic Analysis Zones Map of Gurugram Municipal Corporation area

3.3 Primary and secondary Data Collection

The various surveys that were conducted to build the requisite database for this study included the following:

- 1) Primary Surveys
 - a. Household survey
 - b. Work centre commuter opinion survey
 - c. Boarding and Alighting count (on board)
 - d. Bus on-board - Origin & Destination cum opinion Survey
 - e. Origin – Destination Survey
 - i. IPT Passengers
 - ii. Metro Passengers
 - f. Online commuter opinion survey
 - g. Network Inventory

The detailed schedule of the surveys conducted will be provided in the following sections

- 2) Secondary Data
 - a. The structure of all the routes with details of fare stages and bus stops.
 - b. The route-wise number of buses deployed on each route on an average.
 - c. The average earnings per km (EPK) of each route.
 - d. The details of denomination-wise sale of tickets on each route
 - e. Private operator details and their routes
 - f. Intermediate Public Transport Routes
 - g. Planning parameters like Demographics, Work force, Land use etc.

3.3.1 Selection of Routes for Primary Survey

On board bus users, boarding & alighting and Origin-destination cum opinion surveys have been conducted on 18 Government (HSRTC) operated routes and 4 Private operated routes. The selection of routes for surveys has been done carefully from the presently operational services, ensuring that the data is representative of the travel pattern of the bus passengers.

The routes selected for conducting surveys have been compiled in below table and the coverage is presented in the following figure.

Table 3-1: Haryana State Road Transport Corporation Operated Routes

S.No	Route start Point	Route End Point
1	Gurugram Bus stand	Kendriya Vihar
2	Gurugram Bus stand	Dundahera
3	Gurugram Bus stand	Railway Station
4	Gurugram Bus stand	Palam Vihar
5	Sec 29 Metro Station	Badshahpur via Subash Chowk
6	Gurugram Bus stand	Kasan via Kherki Dhaula
7	Sec 29 Metro Station	ESI Hospital
8	Gurugram Bus stand	IMT Manesar via Hayatpur
9	Sec 29 Metro station	Sohna

S.No	Route start Point	Route End Point
10	Sec 29 Metro station	Hero Honda Chowk via Subash chowk
11	Gurugram Bus stand	Karol Bagh
12	Gurugram Bus stand	Anand Vihar
13	Sec 29 Metro station	Dharampur
14	Sec 29 Metro station	Vatika
15	Gurugram Bus stand	Green Field Colony
16	Gurugram Bus stand	Farrukh nagar
17	Gurugram Bus stand	Heli Mandi
18	Gurugram Bus stand	Kosli

Table 3-2: Bus Routes operated by Private Operators

S.No	From	To
1	Gurugram Bus stand	Bondshi Jail
2	Gurugram Bus stand	Sohna
3	Gurugram Bus stand	Pataudi
4	Gurugram Bus stand	Daruhera

3.3.2 Bus Passenger Origin – Destination cum opinion Survey

The Passenger Origin Destination was conducted as part of bus surveys by using unbiased random stratified sampling on each route by trained enumerators. Details have been collected pertaining to the origin, destination of passengers, modes used for access/egress, trip details such as wait time at bus stop and purpose of the trip, which shall help in re-structuring each route in detail and devise appropriate strategies to incorporate user preferences on existing routing services and proposed requirements of users. The dispersal and access modes of users are studied in order to understand the integration of the bus system with other modes, percentage of change over between routes, etc.

Opinion survey is also conducted to understand the status of existing facilities in user perspective and also to understand the type of services passengers are expecting to enable shift to the public transport.

3.3.3 Origin – Destination Survey (Metro and IPT users)

Origin – Destination survey were conducted at the Metro stations in the study area. Origin – Destination surveys have been conducted even in Intermediate Public Transport (share auto). Passengers were interviewed regarding their origin, destination, trip length, trip purpose and access/dispersal.



Origin – Destination survey of IPT users



Origin – Destination Survey at Metro Parking

3.3.4 Boarding – Alighting survey (on board)

The boarding and alighting count survey was conducted along each route where in the number of persons getting on and off the bus at each bus stop along the journey has been captured at each gate of a bus, so as to minimize any error. The load profile along the route has been plotted to assess spatial and temporal variations in demand. This information has been utilized to identify the high and low demand sections in each route.

3.3.5 Household Survey

The objective of Household Interview Survey (HIS) was to assess the household, socio-economic and trip characteristics of residents within study area. The survey was carried out on a sample basis for 5816 households.

The questionnaire was divided into four main modules, viz. household information, Travel diary, access to services and willingness to shift. The questionnaire was designed to incorporate cross-checks on some of the most important responses for which it may be difficult to obtain reliable, information like household/ personal income etc.

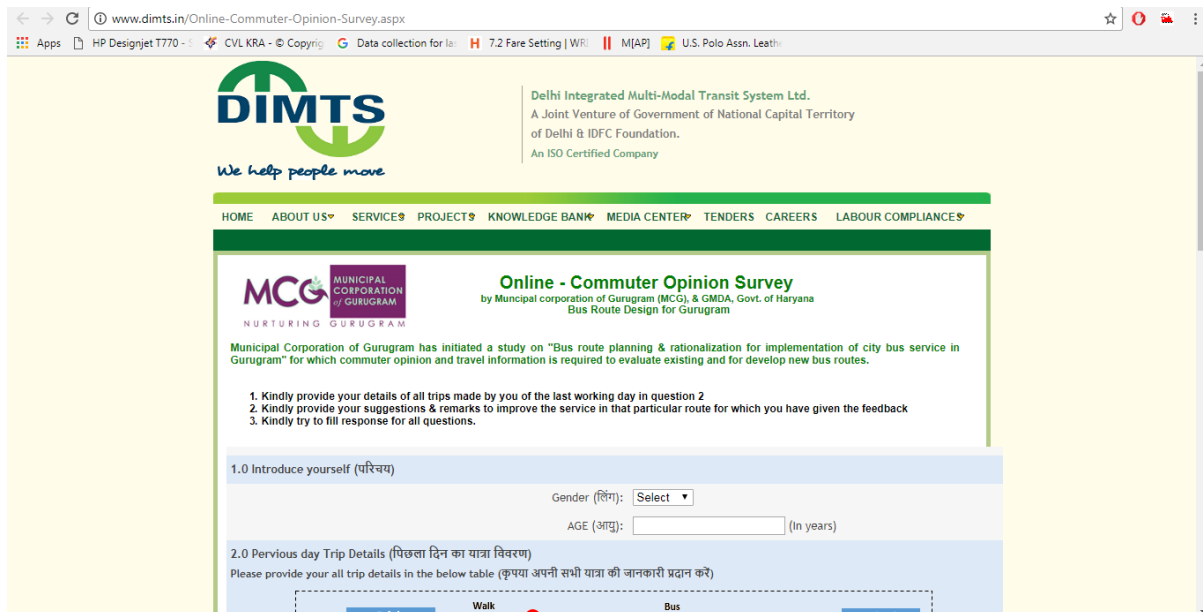
Details were collected for trips performed by the respondent and the family members during the previous working day. The trip details were broken down into individual stages to study the characteristics of linked trips. Selection and training of interviewers is an important component for successful conduct of household travel surveys. The training program for the enumerators was organized prior to conduct of actual field surveys to make them fully aware of the nature, extent, method and necessity to conduct the surveys in an organized manner.

The household survey provided details on socio-economic and personal characteristics at household and individual levels. In addition, it provided detailed household trip making pattern (zone to zone trip tables) and its relation with socio-economic characteristics. A trip has been defined as a journey from a place of origin to a place of destination by a person capable of performing independent trips by any mode, for any purpose and at any time of the day (24 hours).

3.3.6 Online commuter opinion survey

An online survey was designed and uploaded in the website of DIMTS. The link was also available on the websites of Municipal Corporation of Gurugram. The questionnaire had been

designed in a lucid and interactive manner. Total about 850 samples were received from online survey.



www.dimts.in/Online-Commuter-Opinion-Survey.aspx

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MCG MUNICIPAL CORPORATION OF GURUGRAM
NURTURING GURUGRAM

Online - Commuter Opinion Survey
by Municipal Corporation of Gurugram (MCG) & GMDA, Govt. of Haryana
Bus Route Design for Gurugram

Municipal Corporation of Gurugram has initiated a study on "Bus route planning & rationalization for implementation of city bus service in Gurugram" for which commuter opinion and travel information is required to evaluate existing and for develop new bus routes.

1. Kindly provide your details of all trips made by you of the last working day in question 2
2. Kindly provide your suggestions & remarks to improve the service in that particular route for which you have given the feedback
3. Kindly try to fill response for all questions.

1.0 Introduce yourself (परिचय)

Gender (लिंग):

AGE (आयु): (In years)

2.0 Previous day Trip Details (पिछला दिन का यात्रा विवरण)
Please provide your all trip details in the below table (कृपया अपनी सभी यात्रा की जानकारी प्रदान करें)

Origin	Walk	Bus	Destination

3.3.7 Work Centre commuter opinion survey

As Gurugram is a major hub for Industries, Software companies, BPO companies and others. It is majorly a work based city. Keeping this in view, opinion survey has been conducted in the identified work centers to evaluate the user perspective about the existing bus services and the type of services being expected.



Figure 3-3 : Work Centre commuter opinion survey

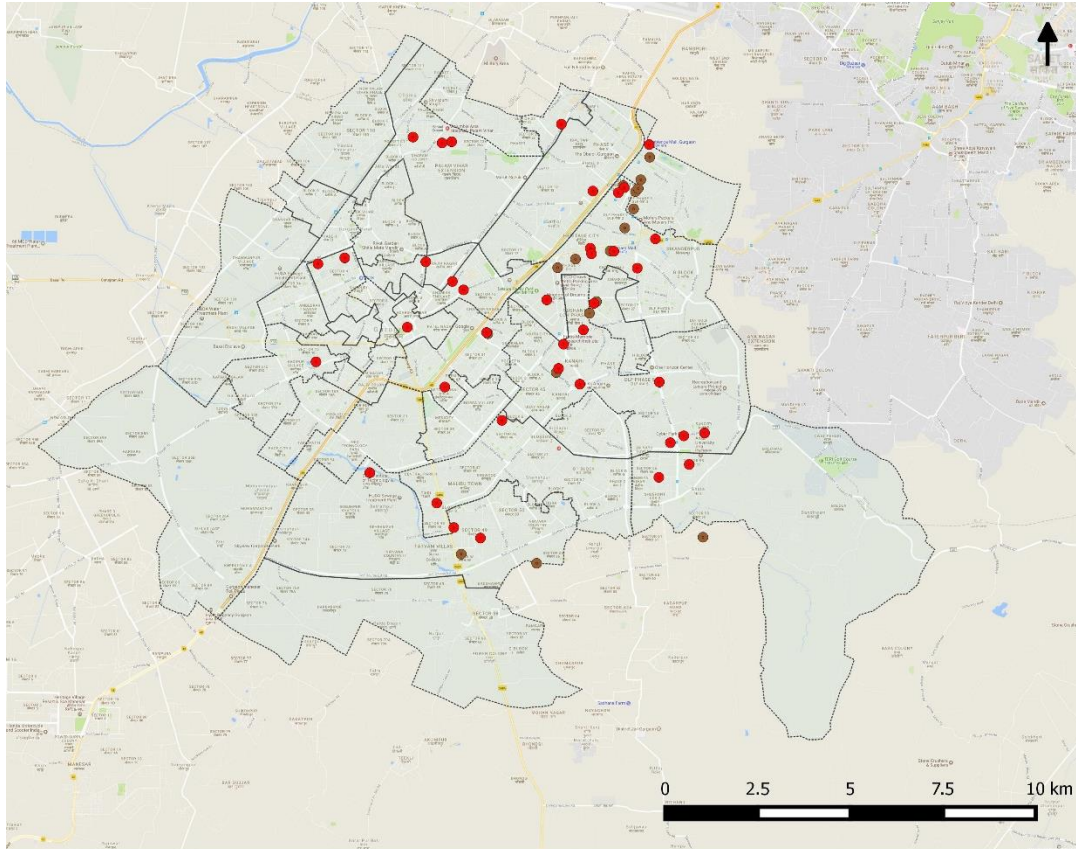


Figure 3-4: Map showing work centres at which commuter opinion survey is carried out

3.3.8 Network Inventory

The road network inventory was done to collect the information that describes the location, design characteristics, dimensions and other physical features of the road network such as ROW, location of bus stops etc. Any modifications to the existing available data were supplemented by data collected from the Consultant's road inventory field survey. The information mainly includes the cross-section details, link lengths, locations of bus stops, type, details of intersections and control devices etc.

3.4 Analysis of Existing Travel Characteristics

3.5 Household Surveys Analysis

The methodology was used to collect the information regarding their journeys on the previous working day by noting down their start and end location with respect to the TAZ, mode of travel, purpose of travel, time required to travel, the access-egress time and their modes, etc. The total household surveyed were 5816 of which the travel diary information was collected of the household members from the respondent. Stratified random sampling method was used to achieve sample size. From the ward population TAZ wise population was estimated. The number of samples are collected in such a way that, where the residential population is high the sample size also high. For equal distribution to sample 2% household representation from each ward has been taken. Demographic and trip details have been collected for 19,462 persons.

3.5.1 Demographics profile

Through the household survey, average household size in Gurugram (MCG) has been estimated as 3.35 persons. The distribution of households by size has been presented in Table below.

Table 3-3 Distribution of Household by Size

S. No.	Household Size Range	Municipal Corporation Gurugram
1	0-2	26.9%
2	02-04	55.0%
3	04-06	16.2%
4	Above 6	1.9%
Total		100.0%

From the above table, it can be observed that, about 55% of the household size falls under the range of 02 -04 persons and followed by the household size range of 0-2, which accounts to total 27% of the household sample. This shows that, almost 82% of the households in Gurugram are nuclear size families.

3.5.2 Gender

As stated in the earlier part of report that, total 5816 household samples were interviewed which accounts to total 19,642 persons. 57% were males and 43% were females. The percentage of male and female has been shown in the below figure:

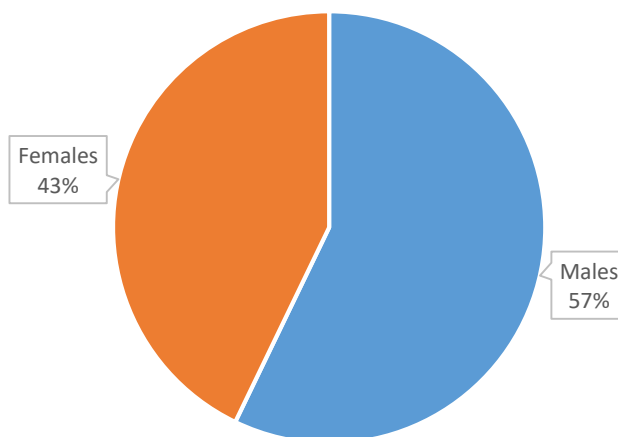


Figure 3-5 : Gender

3.5.3 Vehicle ownership levels

Distribution of Household by vehicle ownership

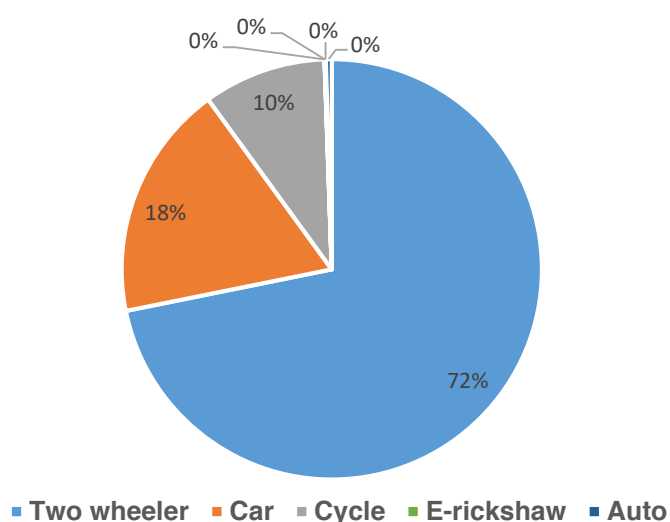
From the sample survey analysis, it is observed that, about 96% of households are having their own vehicle which directly indicates high dependency on private vehicles. Nearly 70.3% of households are owned at least one vehicle and 25.5% of households are owning vehicle two or more vehicles. Based on the analysis it is revealed that, ownership rate is very high, which 3 vehicles for every 10 persons in the city.

Table 3-4 Distribution of Household by vehicle ownership

S. No.	Vehicle ownership	%age of Household
1	No Vehicle	4.2%
2	1 Vehicle	70.3%
3	2 Vehicles	22.9%
4	3 Vehicles	2.6%
Total		100.0%

Composition of Mode wise ownership

From the analysis it is observed that, the Gurugram has comparatively low car ownership rates as compared to two wheelers and cycles and it is generally observed in the medium size cities in India. Out of total vehicular ownership, nearly 72% is two-wheeler vehicles. Three major modes of transport are owned by household of Gurugram are Two-wheeler, Car and cycle. The composition of vehicle wise ownership is as presented in the below figure:

**Figure 3-6 : Composition of Vehicle wise ownership****Monthly Income**

In the sample survey, Monthly income is collected and has been analysed, from the analysis it has been revealed that, almost 67.9% of households are under the middle income group (15001 to 50000) and followed by low income group (below 15000) with 24.4%.

Table 3-5 : Monthly Income

Income Range	% of Share
Up to 15000	24.4%
15001 - 30000	40.6%
30001 - 50000	27.3%
50001 - 100000	6.6%
Above 100000	1.2%
Total	100.0%

Monthly income wise vehicle ownership

An attempt has been made to understand the relation between the income levels and the vehicular ownership levels in the study area. The consultant tried to analyse the monthly income with respect to vehicle ownership and it is observed that, across all the income groups the ownership of two wheeler is high which is nearly 65% and It is already observed that, the middle income group (150001 to 50000) population has the large share, where almost 75% vehicle ownership is under two wheeler. The income wise vehicular ownership distribution has been shown in table below:

Table 3-6 Income-Wise Vehicular ownership at household level

Income Range (In INR)	Mode			
	Car	Two-Wheeler	Cycle	Auto
Upto 15000	2.8%	74.6%	22.3%	0.3%
15001 - 30000	15.4%	75.0%	8.9%	0.7%
15001 - 30000	27.6%	70.0%	2.0%	0.4%
50001 - 100000	43.1%	55.0%	1.9%	0.0%
100000 and above	40.7%	59.3%	0.0%	0.0%
Total	18.2%	71.9%	9.5%	0.4%

Future vehicular ownership preference

During Household travel surveys, the respondents were also asked about information on such as; what is there preferred future vehicular mode they want to own. From the analysis, it was observed that, out of total household surveyed, 55% wants to buy cars as their future vehicular mode and 45% wants to buy two-wheeler as their future vehicular mode.

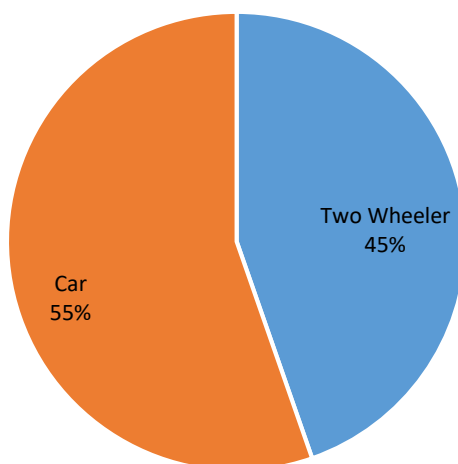


Figure 3-7 Future ownership of mode/ user willing to buy

The same relationship has been attempted on the future ownership of modes; it revealed that, household falling under lower income groups are more interested in buying two-wheelers. While for higher income groups, the situation is other way around. From the analysis it revealed that, about 59% of household, present status does not own any vehicle, they are willing to buy two-wheeler in the future and the 39.1% of existing two-wheeler owning households are willing to buy car in the future. Based on the analysis it reveals that the dependency of private vehicle will further increase in the future, so there is a need to improve the public transportation in the study area. The comparison has been shown in table below.

Table 3-7 Future ownership mode w.r.t. to Income range

Present Mode/ Future Mode	No vehicle	Two Wheeler	Car	Total
No vehicle	41.5%	58.5%	-	100.0%
Two-Wheeler	-	-	39.1%	39.1%
Cycle	-	56.6%	-	56.6%

3.5.4 Travel Characteristics

Per Capita Trip Rate of the city

The Per Capita Trip Rate (PCTR) indicates the mobility of the people through a particular mode of transport. It is the ratio of total number of trips made by a particular mode of transport to the total surveyed population. Higher the PCTR value implies that large number of trips. PCTR has been calculated at two levels a) including walk and excluding walk trips. PCTR of residents in MCG area is 1.83 which means that on an average approximately two trips are made by the residents of MCG area. PCTR of including walk and excluding walk for MCG area is presented in the below table.

Table 3-8: Per Capita Trip rate of MCG residents

Parameters	Details
Population under MCG area	1176228
Total Trips (incl. Walk)	2153314
Per Capita Trip Rate (incl. Walk)	1.83
Total Trips (Excl. Walk)	1580766
Per Capita Trip Rate (Excl. Walk)	1.34

Mode Split

For without walk trips, 2 wheeler (Scooter/Motor cycle) is the major mode of travel accounting for 35.7% of all the trips. Auto/ Shared Auto and Cars account for about 28.3% and 12.6% of trips respectively. Overall the modal share of public transport mode is only 11.2%. The table below presents the trip distribution with walk and without walk of entire MCG area and figures presents the mode split of MCG area with & without walk trips

For trips including walk, nearly 26.6% trips are made by walk followed by 2 wheelers (Scooter/Motor cycle) with 26.2%, and Auto/ Shared Auto 20.8%. And overall mode share of Public Transport is 8.2%.

Table 3-9: Mode split with & without walk trips – MCG area

Mode	Total Trips	% Share (Inc. Walk)	% Share (Excl Walk)
Two Wheeler	564230	26.20%	35.70%
Car	199414	9.30%	12.60%
Taxi	15734	0.70%	1.00%
Auto + Share Auto	446672	20.80%	28.30%
Bus	163498	7.60%	10.30%
Company Bus	916	0.00%	0.10%
School Bus/Van	50298	2.30%	3.20%
School Auto	216	0.00%	0.00%
School Rickshaw	648	0.00%	0.00%
Van	26968	1.30%	1.70%
Metro	13990	0.60%	0.90%
Train	2452	0.10%	0.20%
Cycle Rickshaw	3452	0.20%	0.20%

Mode	Total Trips	% Share (Inc. Walk)	% Share (Excl Walk)
E-Rickshaw	8262	0.40%	0.50%
Cycle	83182	3.90%	5.30%
Walk	572548	26.60%	
Total	2153314	100.00%	100.00%

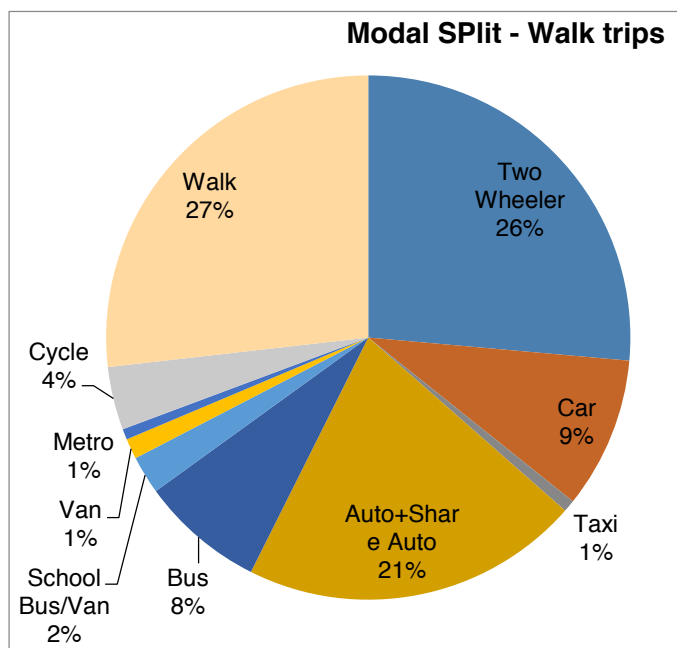


Figure 3-8: Modal split - With Walk Trips

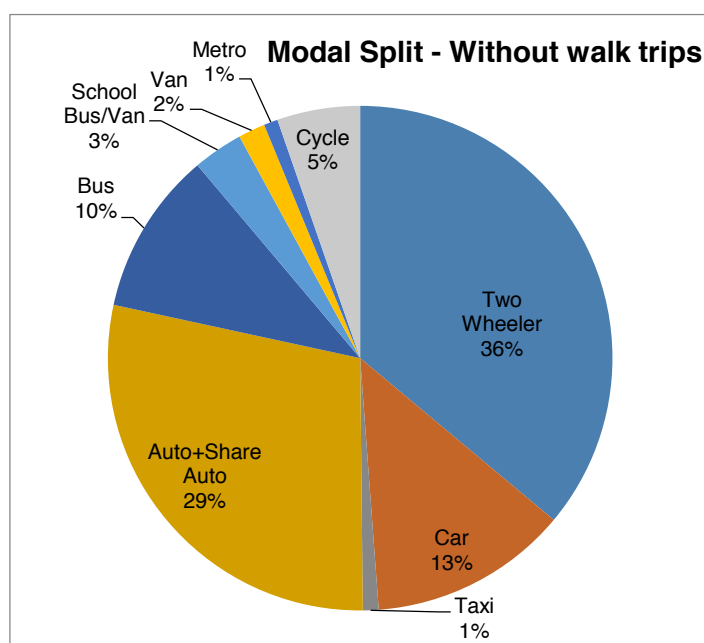


Figure 3-9 : Modal Split - Without walk Trips

Trip Length

On an average trip length in MCG area is 4.8Km (50% of the total trips), nearly 77% of the trips made within 10Km and about 90% of the trips made within 14Km. The figure below shows the trip length frequency distribution in absolute and cumulative percentage of trips.

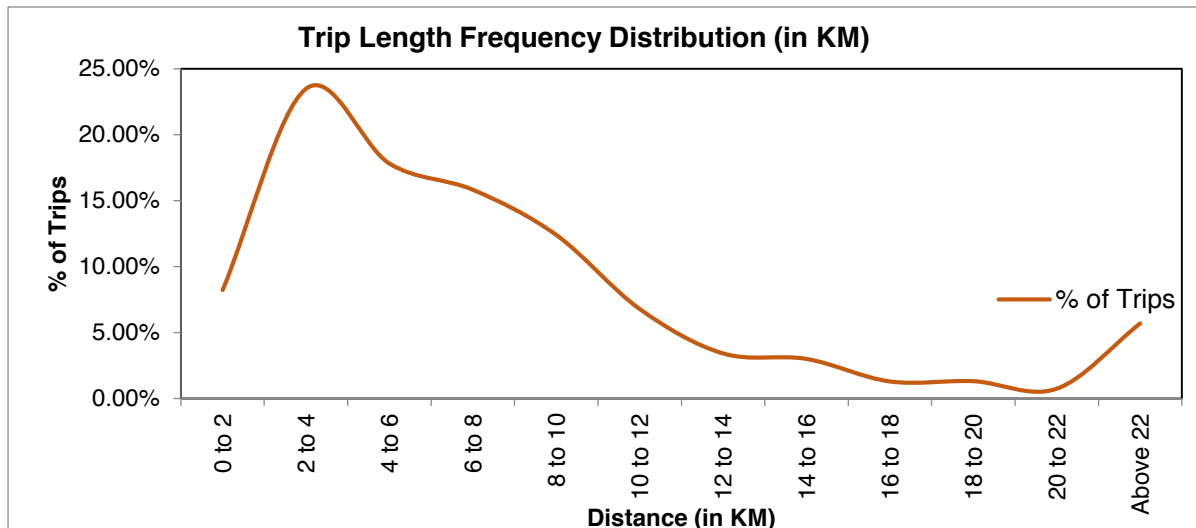


Figure 3-10 : Trip Length Frequency Distribution (in KM)

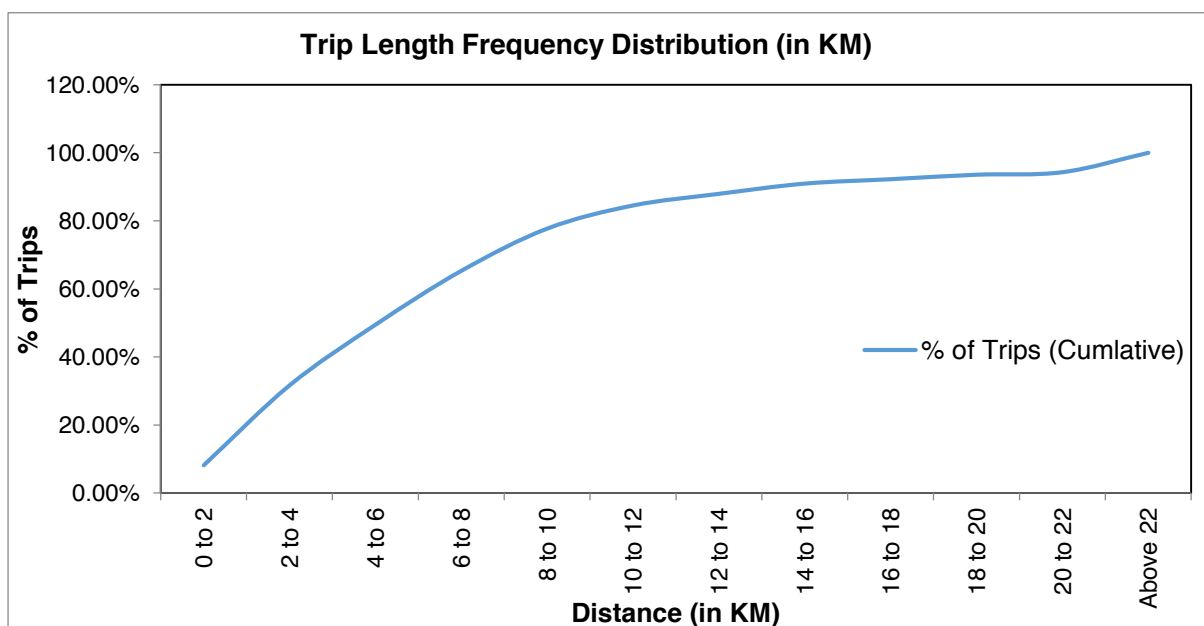


Figure 3-11 : Trip Length Frequency Distribution (in KM) in Cumulative

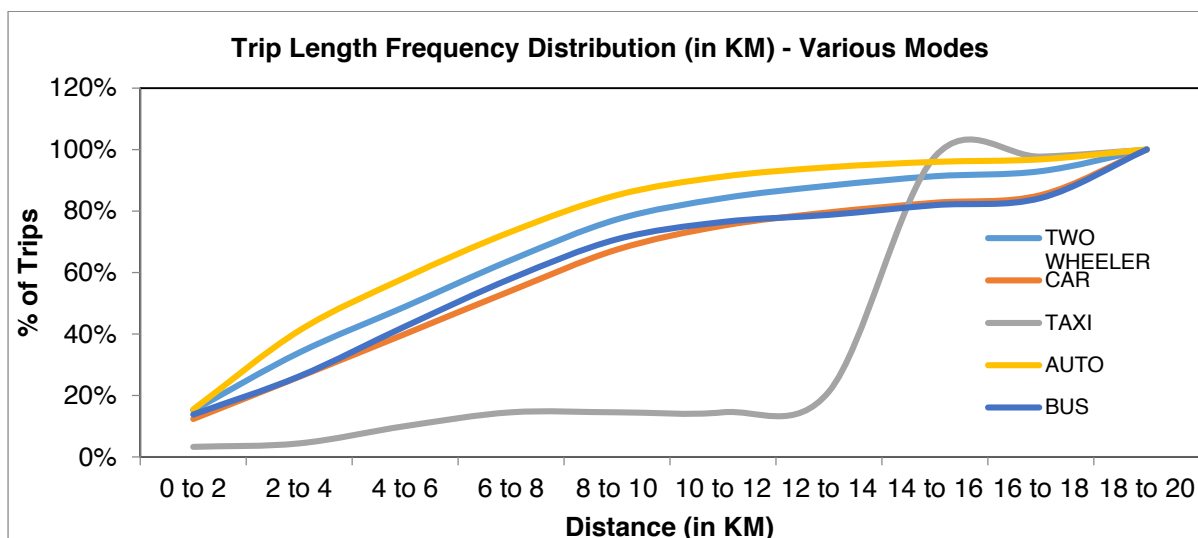


Figure 3-12 : Trip Length Frequency Distribution of Various Modes (in Cumulative)

Table 3-10 : Average Trip Length (in KM) of Major Modes

Mode	Average Trip Length (in Km)
Two-Wheeler	7.48
Car	8.49
Auto + Share Auto	5.83
Bus	8.03

Reason for Not Using Bus services

The consultant also collected information on why they are not using the present bus services. From the analysis, it has come out that respondents gave 9 different reasons for not using the current bus service. Out of the total respondents, 27% stated that there are no routes available to their desire destination, it directly indicates there is a need of network level improvements in the bus service and nearly 25% respondents stated that they use their own vehicles to commute. The reasons for not using the bus service have been presented in figure below:

Reason for not using bus service	% of Share
Use own vehicle to travel	24.5%
Traffic Jams	5.4%
No Route	27.2%
Crowding in the bus	18.0%
Timing Problem	10.9%
No Bus stop Near by	6.4%
Poor Bus service	7.4%

Figure 3-13 Reasons stated for not using the bus services

3.5.5 Users suggestions on existing bus services

In this section, the consultant analysed the suggestions received from the user on bus system such as:

- Preference on type of services

- Suggested fare for bus journey
- Frequency
- Suggestion on new routes.

Preference on type of service

From the below figure it can be observed that, almost 42% of the users wants Non-Ac buses, while AC bus service is needed by 36%, followed by 8% which is point to point buses and 14% of users stated express service is needed.

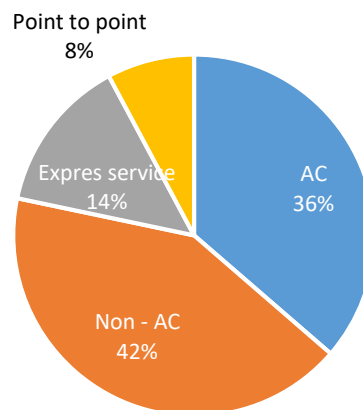


Figure 3-14 Type of service preferred

Users suggested bus fare

From the figure below, it can be seen that almost 86% of the users ready to pay the bus fare between 5 to 10 INR for 5Km of travel, which means per kilometre for travel they ready to pay 1 to 2 INR.

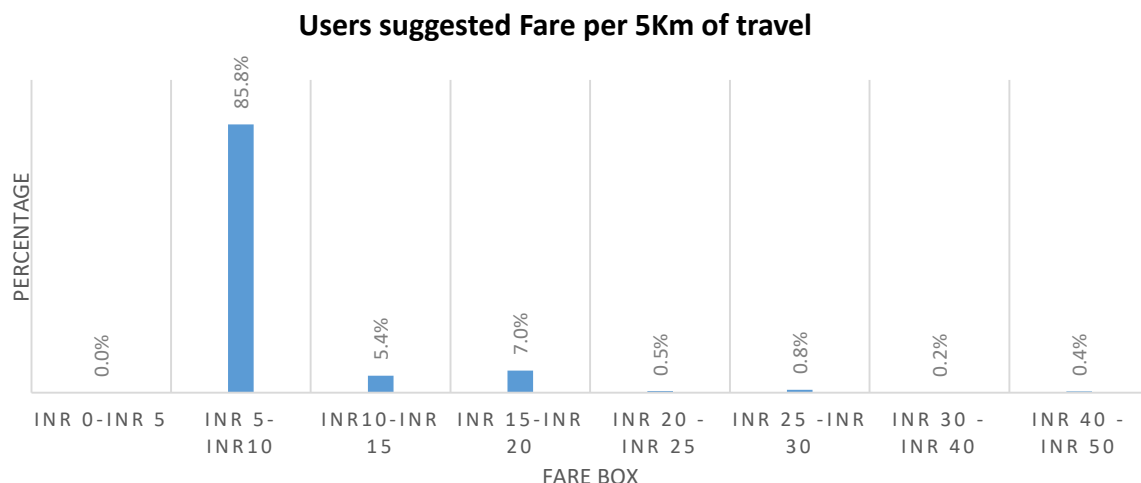


Figure 3-15 Suggested Bus Fare as per User Perspective

Bus frequency requested by users

Out of the total responses, almost 69% of the users want the bus frequency to be less than 10 minutes. The figure below shows the distribution of user's response on frequency interval.

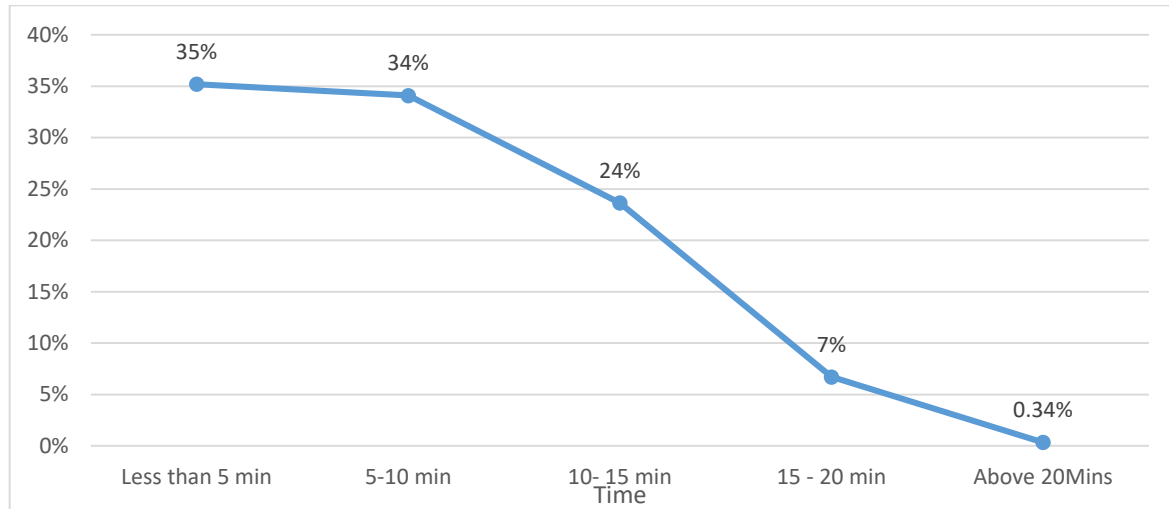


Figure 3-16 Bus Frequency requested by users

3.6 OD cum opinion Survey at Work Centres

Gurugram is acting as satellite city of Delhi, with prominent employment generation centres such as industrial, IT, BPO and commercial hub with about 1.5 million population. Gurugram has about 12,000 commercial offices and industries. About 40% of the working population in Gurugram are not residents of Gurugram, they all are commuting from Delhi and others surrounding cities. Opinion & origin destination surveys were conducted at the major employment generation nodes in the city, to understand the travel patterns of these commuters and these cannot be captured under the household survey. Work center surveys were conducted two levels; one is within the office, through online & offline method and other one at the office parking sites. The figure below represents all the locations where the work place survey has been conducted.

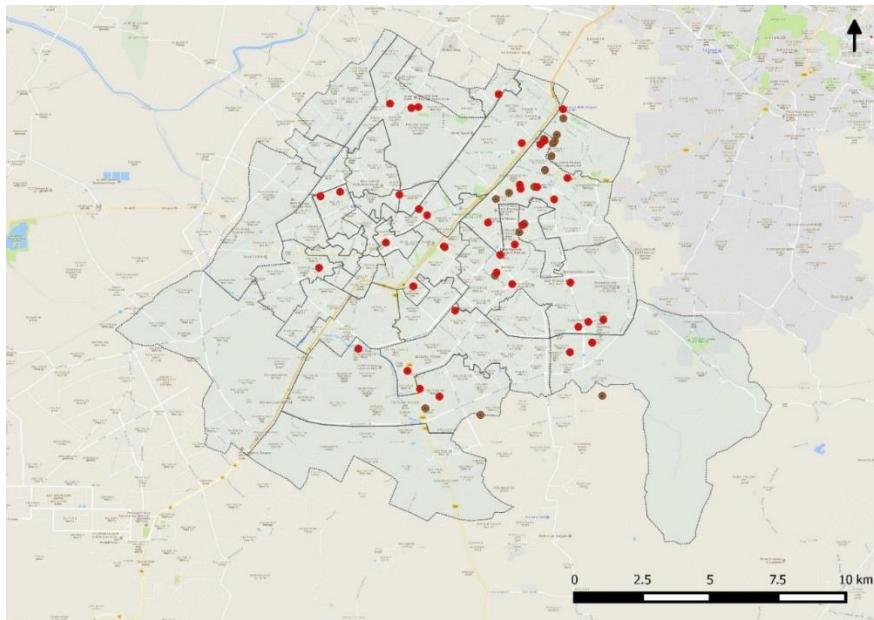


Figure 3-17 Work Place Opinion Survey Locations

A total of 1162 samples have been collected covering all major nodes and spreading over the city.

3.6.1.1 Travel pattern:

From the commuter's response, it has been observed that the about 33% of the commuters have either origin or destination outside Gurugram of which Delhi has the maximum share of about 29.5 %. Remaining 67 % of the trips by the commuters are within Gurugram (GMDA).

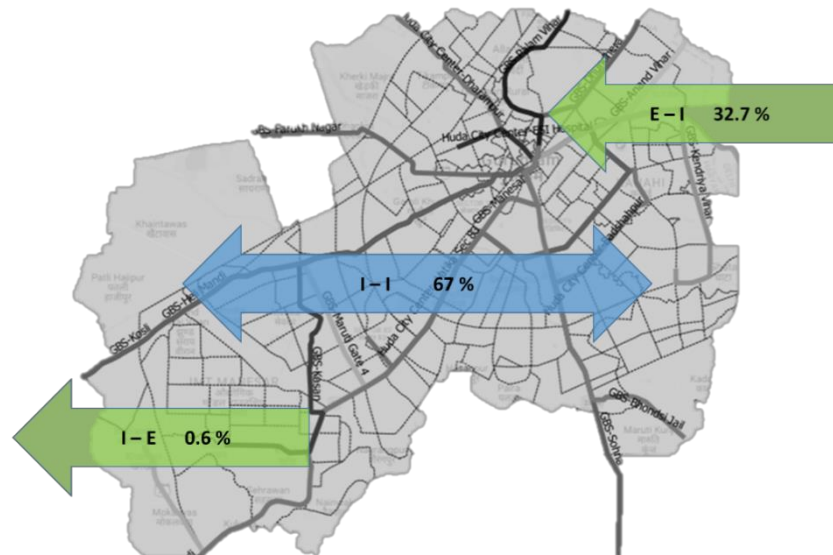


Figure 3-18 Travel Pattern

3.6.1.2 Main Haul mode choice

From the analysis it was observed that, almost 51% travel to work using private mode of transport followed by auto which account to about 22%. All these auto commuters can be the potential divertible commuters if the bus system is improved.

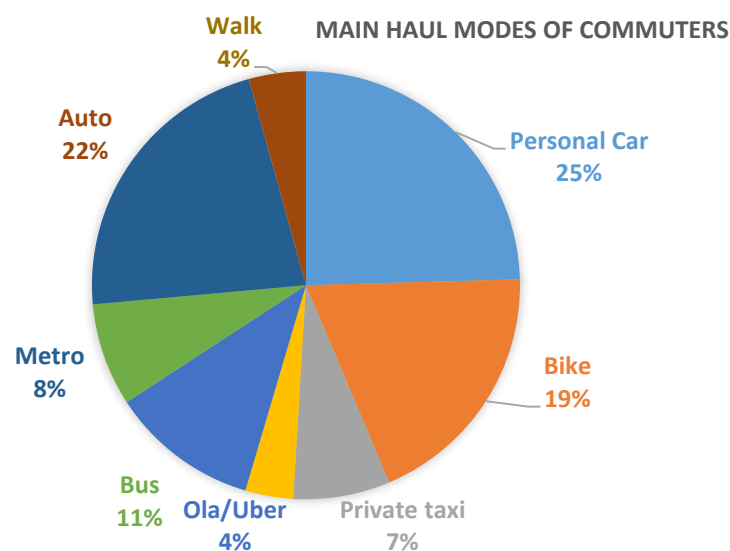


Figure 3-19 Main haul Mode of commuters

3.7 Boarding / Alighting at Bus Stops

Boarding and alighting survey has a critical role in the planning and rationalizing of public transport bus routes. This survey helps in quantifying the passenger demand at various bus stops in the study area. It also helps in demand estimation of public transport and planning of public transport facilities.

The numbers of passengers getting on and off the bus at each bus stop have been noted in Boarding and Alighting count survey. This survey was carried out along 19 routes to estimate the boarding and alighting at different bus stops and also the section loads on different routes in the city figure below shows the different bus routes in the city.

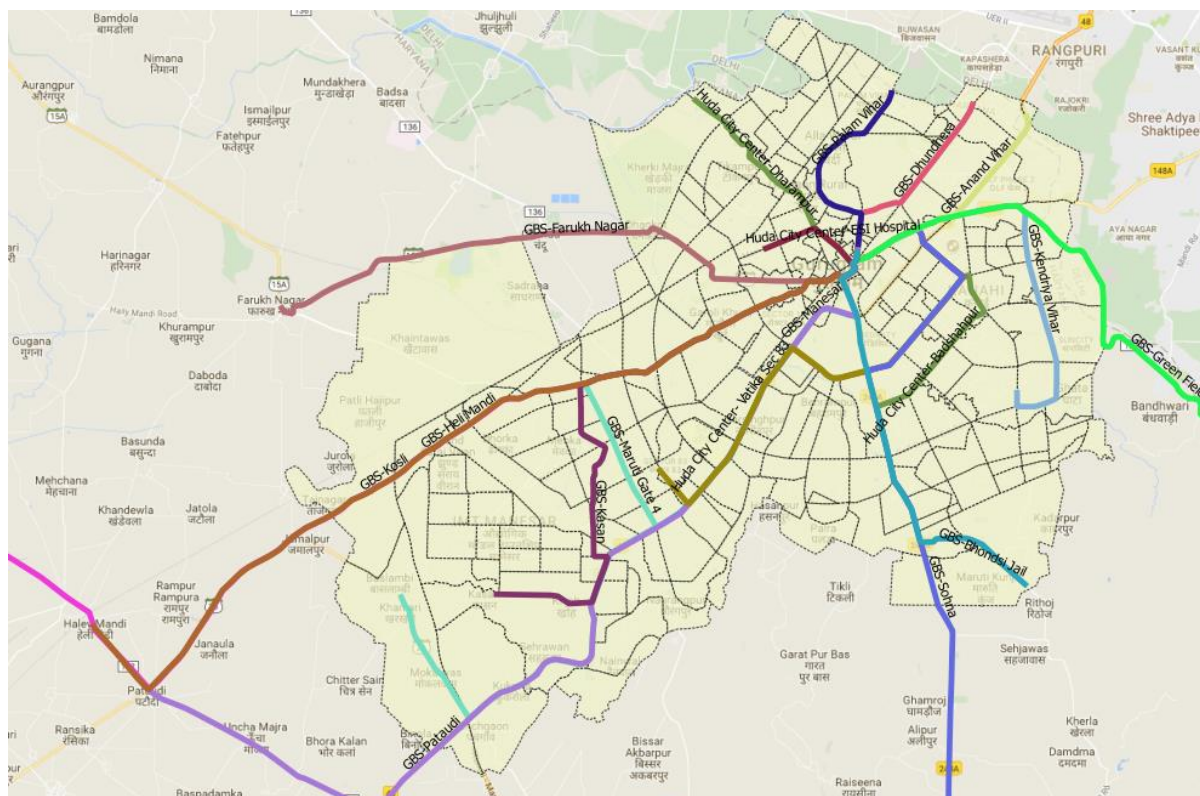
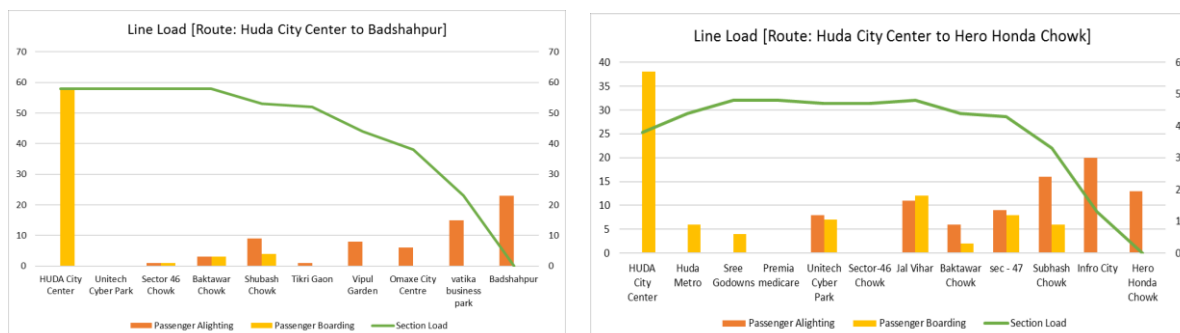


Figure 3-20: Public Transport Bus Routes in Gurugram City

The passenger load profile of each surveyed route has been worked out from the boarding and alighting counts done inside the bus. This analysis helped in determining high load sections, major boarding / alighting points and total trip loadings to determine route efficiency and scope for adjustments. Load profile of few bus routes are provided in the Figure below.



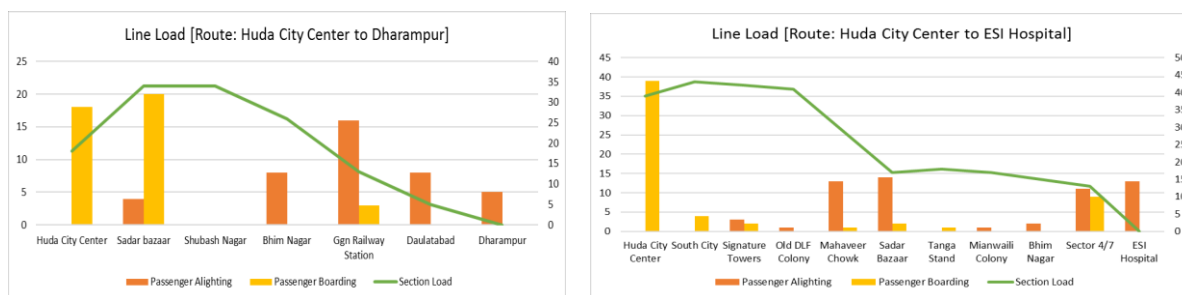
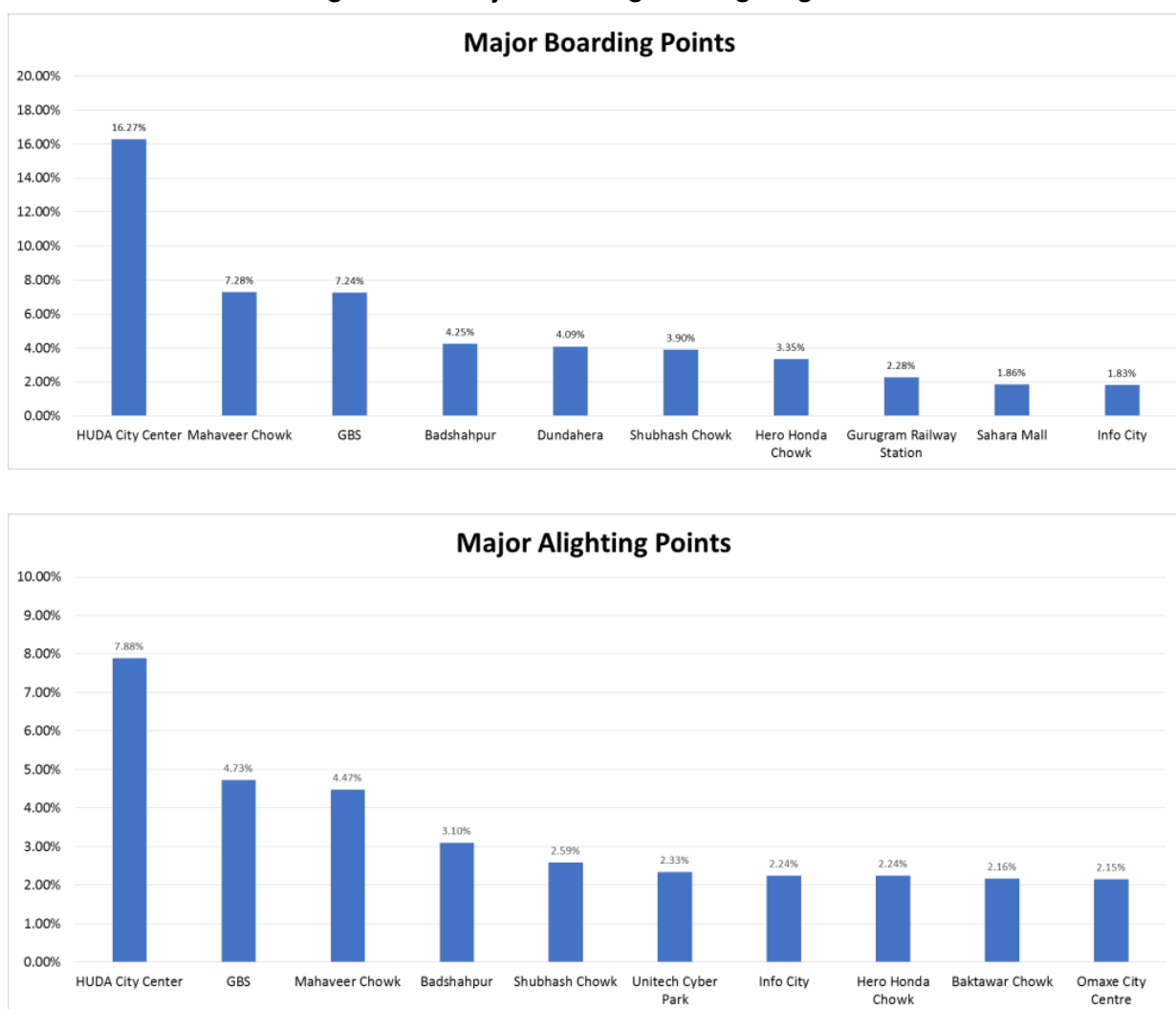


Figure 3-21: Passenger Line Load of Major Bus Routes in the Gurugram City

Also, on analysing the demand across bus points it has been observed that, HUDA City Centre bus stop has the highest boarding passengers (16.3%) followed by Mahaveer Chowk (7.3 %) and Gurugram Bus Stand with a share of 7.2%. Similarly, on analysing the alighting patterns of the passengers, it has been observed that HUDA City Centre has the highest alighting demand (8%) followed by Gurugram Bus stand (4.8%) and Mahaveer Chowk with 4.5 %. The Figures below illustrate the top ten boarding and alighting points based on the primary survey.

Figure 3-22: Major Boarding and Alighting Points.



3.8 Travel Characteristics of Public Transport Users

To understand the travel pattern and characteristics of the existing public transportation users, all the available public transport modes in the study area has been studied by conducting various surveys. The following are public transport systems available in the study area

- Bus system – Operating by Government (24 routes) & Private (4 routes)
- Intermediate Public Transport (31 routes)
- Mass Rapid Transit system (MRTS) – Operating by DMRC (1 line) & Rapid Metro (1 line)

Surveys conducted at MRTS station to understand the access & dispersal pattern of the users to provide feeder service which will enhance the public transport share in the city and decrease the congestion levels in the city. In the sub-sections the surveys conducted for each public transport and their results are detailed

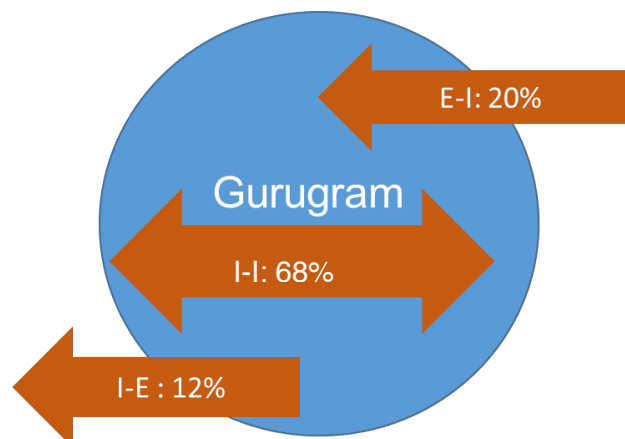
3.9 Bus system

The travel characteristics of city bus system users are evaluated by conducting On-board passenger Origin – Destination survey and opinion survey on all bus routes being operated in the city. Commuters who use especially bus as their main haul mode will be interviewed to collect information about their trip characteristics like their origin, destination, purpose of that particular trip, waiting time at the bus stop and access/dispersal mode to the bus stop.

The bus on-board survey was conducted on all operational routes in the study area. A sample size of 4800 respondent was obtained where passengers revealed the following characteristics.

3.9.1.1 Travel Characteristics

From the primary analysis, it was observed that 68% of the trips made by the public transport are within study area i.e. Gurugram and GMDA area. 12 % of the trips are Internal to External trips i.e. from Gurugram to either Delhi or other parts of the study area. 20% of the trips made by public transport are External to Internal trips i.e. from Delhi to Gurugram.



3.9.1.2 Route wise Demand

Based on the collected primary survey and secondary data, Demand for each of the surveyed routes has been estimated. The total public transport demand (only government operated buses) has been observed to be 96363 passenger trips. The route originating from Gurugram bus stand and terminating at Dundaheera has the highest demand amounting to 29316 passenger trips/day.

Table 3-11 Route wise Demand

S.No	Bus Route		Demand
	Origin	Destination	
1	Bus stand	Kendriya Vihar	9810
2	Bus stand	Dundahera	29316
3	29 Metro Station	Railway Station	17760
4	Bus stand	Palam Vihar	1308
5	29 Metro Station	Badshahpur	8070
6	Bus stand	Kasan via Kherki Dhaura	618
7	29 Metro Station	ESI hospital	1599
8	Bus stand	IMT Manesar via Hayatpur	4040
9	29 Metro Station	Sohna	1662
10	29 Metro Station	Hero Honda chowk	17304
12	Gurugram	Anand Vihar	780
13	29 Metro Station	Dharampuri	489
14	29 Metro Station	Vatika	654
15	Gurugram	Green Field colony	102
16	Gurugram	Heli Mandi	348
17	Gurugram	Farrukh nagar	254
18	Gurugram	Kosli	740
Total			96363

3.9.1.3 Trip Purpose of bus users

As mentioned in the earlier sections, Gurugram being a prominent hub for industrial, IT, BPO and commercial hub, most of the trips made to, or within Gurugram are work based trips. The same was observed from the survey that, 59% of the passengers using the bus to commuting to their work places. The detailed trip purpose characteristics of the public transport users are shown in the following figure.



Figure: Trip purpose characteristics of Bus users

3.9.1.4 Access/Dispersal mode of bus users

From the analysis it was observed that, walk is the predominant mode (36 % of the users) to access/disperse the bus service. Intermediate Public Transport (Share auto) is the next predominant mode (21% of the users) used as access/dispersal mode followed by Auto where 13% of the bus users use it as an access/dispersal mode. The detailed access/dispersal characteristics of the public transport users is shown in the following figure

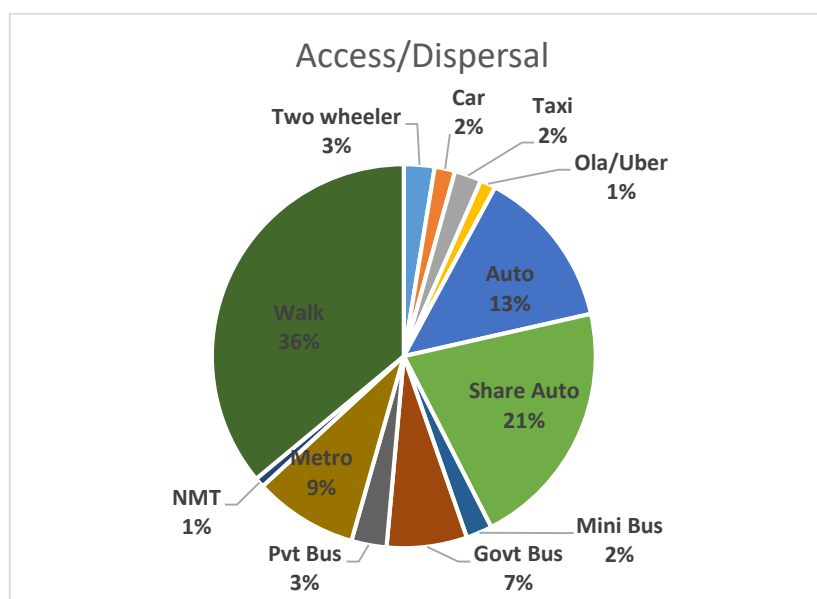


Figure: Access/dispersal characteristics of Bus users

3.9.1.5 Waiting time at bus stop

It was observed that approximately 60% of the users wait less than 10 min at the bus stop for the bus service. The detailed percentage distribution of trips based on waiting time at the bus stop is shown in the below figure.

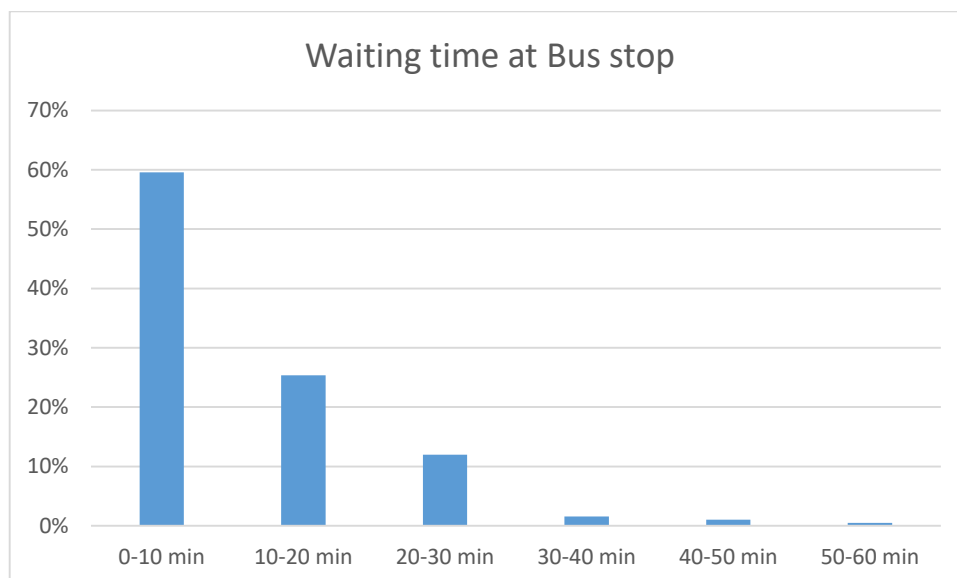


Figure: Waiting time of passengers at Bus stops

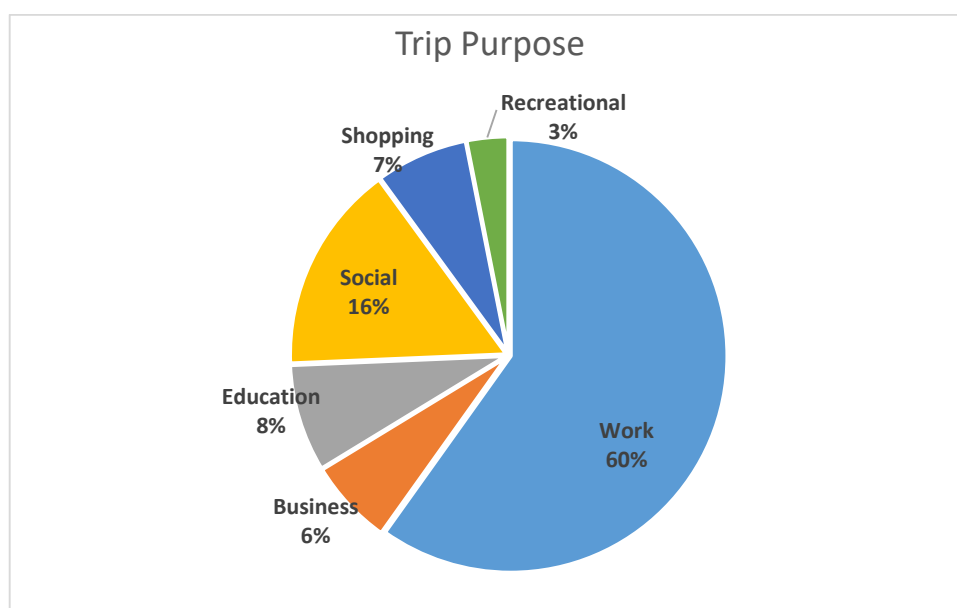
3.9.2 Analysis of bus user travel characteristics by operator

In the study area, buses are being operated by both Government and Private operators. Only part routes are being operated by the private operators. For better and detailed understanding of the travel characteristics of the bus users, analysis has been carried out as per the type of bus operator.

3.9.3 Analysis on bus routes operated under Government:

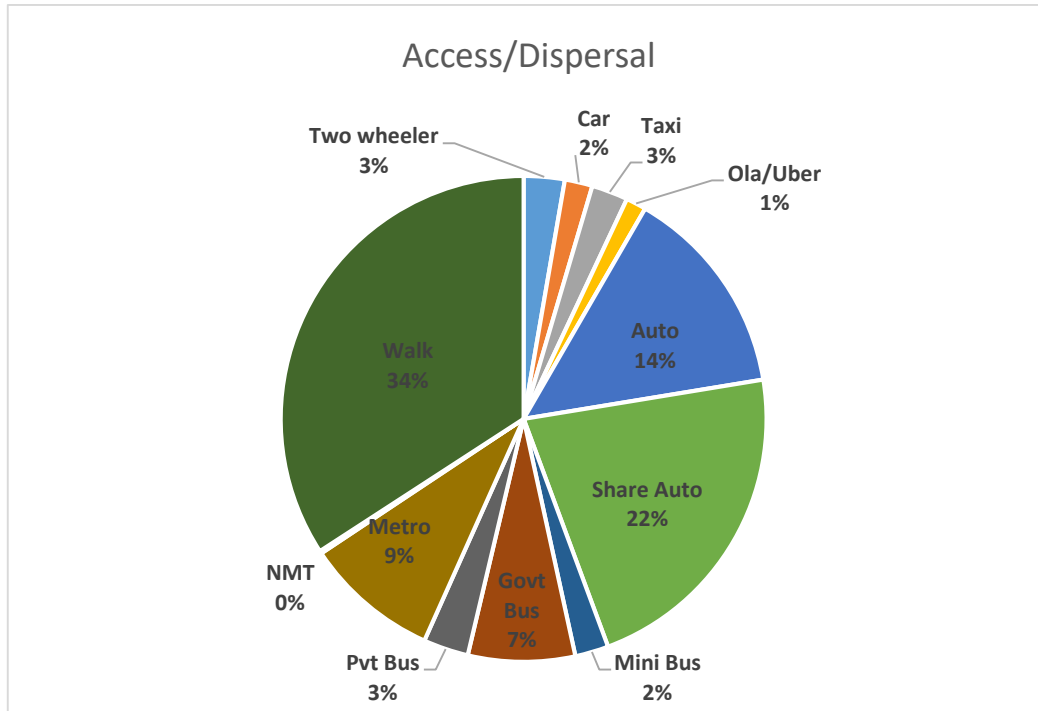
3.9.3.1 Trip Purpose of bus users

The majority of the passengers (60%) travelling in government operated buses were commuting to their work places. The other purpose for which majority of the passengers (around 16%) using public transport especially government operated buses were for Social reasons. The detailed trip purpose characteristics of the passengers travelling in government operated buses are shown in the following figure.



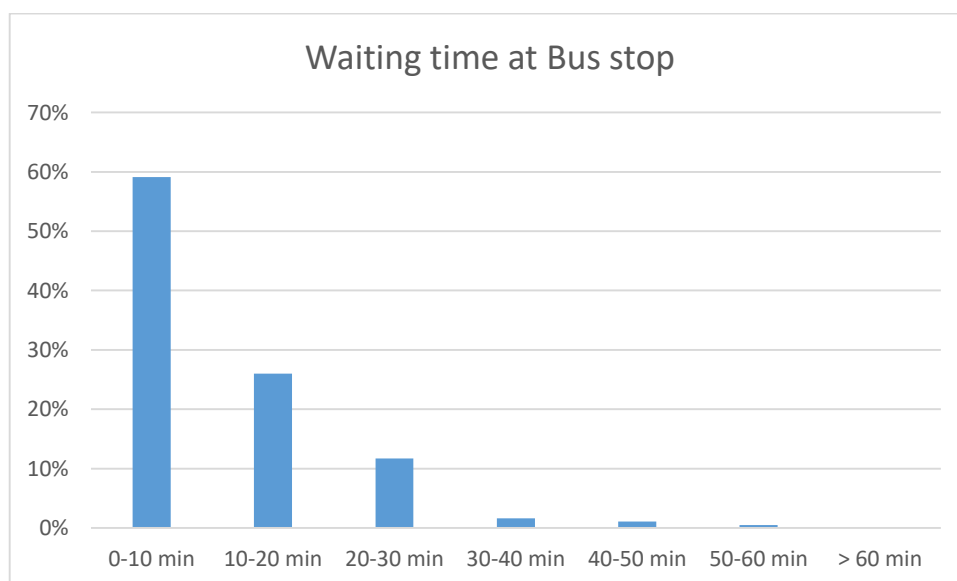
3.9.3.2 Access/Dispersal of Public transport users

It was observed that, walk is the predominant mode (34 % of the users) to access/disperse the Public transport system. Intermediate Public Transport (Share auto) is the next predominant mode (22% of the users) used as access/dispersal mode followed by Auto where 14% of the Public transport passengers use it as an access/dispersal mode. The detailed access/dispersal characteristics of the public transport users are shown in the following figure.



3.9.3.3 Waiting time at bus stop

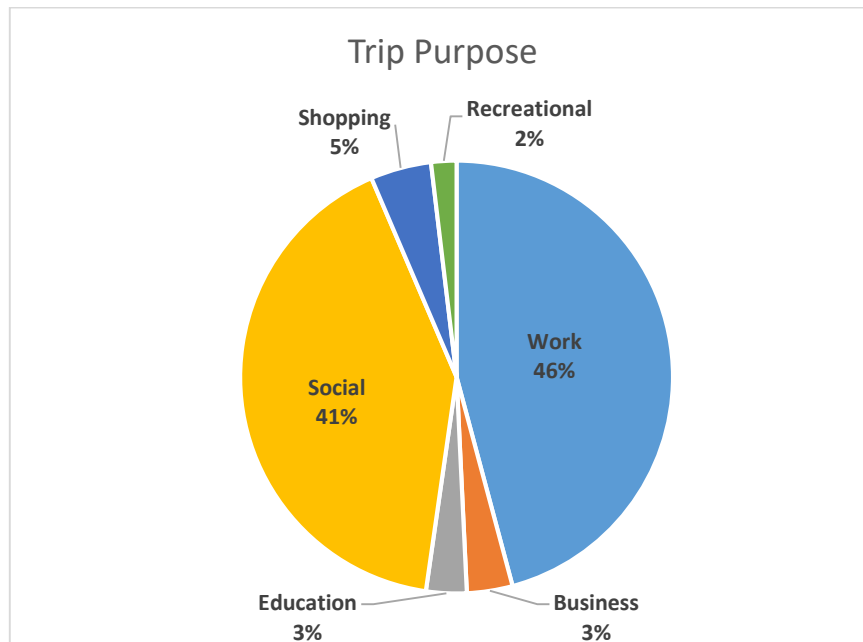
It was observed that approximately 59% of the users wait less than 10 min at the bus stop for the bus service. The detailed percentage distribution of trips based on waiting time at the bus stop is shown in the below figure.



Private operator:

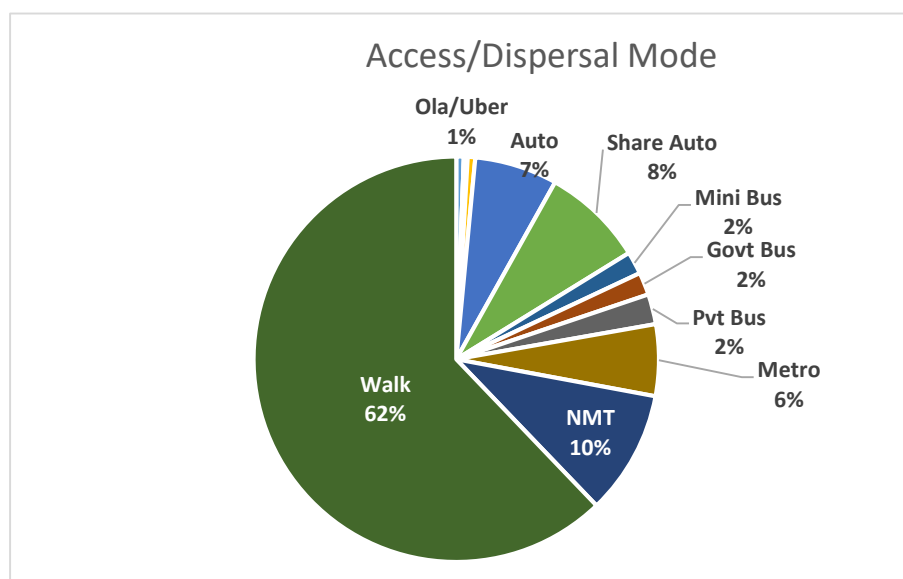
3.9.3.4 Trip Purpose of Public transport users

The majority of the passengers (46%) travelling in private operated buses to commute to their work places. 41% of the users use for social purpose. The detailed trip purpose characteristics of the passengers travelling in government operated buses are shown in the following figure.



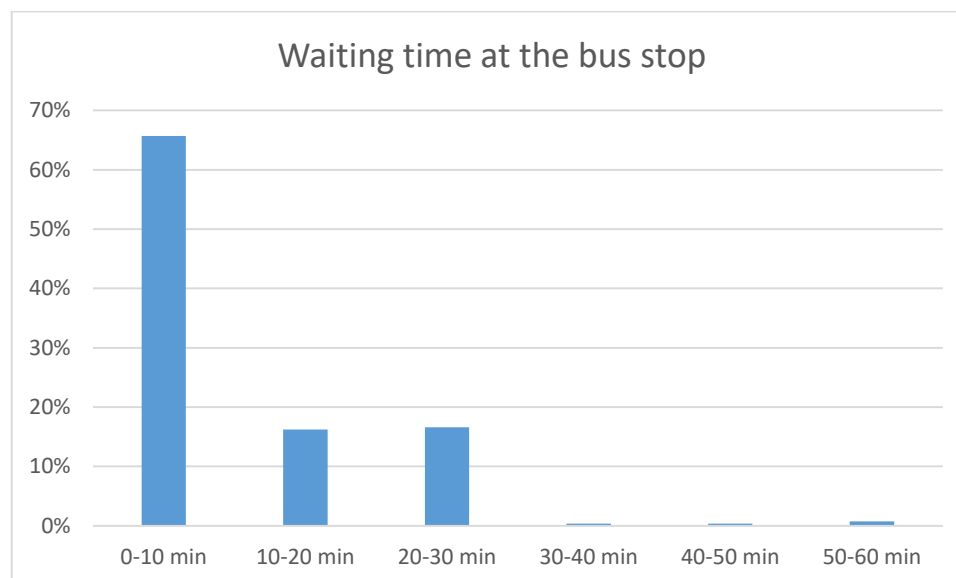
3.9.3.5 Access/Dispersal of Public transport users

It was observed that, walk is the predominant mode (36 % of the users) to access/disperse the bus system. The detailed access/dispersal characteristics of the public transport users are shown in the following figure.



3.9.3.6 Waiting time at bus stop

It was observed that approximately 66% of the users wait less than 10 min at the bus stop for the bus service. The detailed percentage distribution of trips based on waiting time at the bus stop is shown in the below figure.



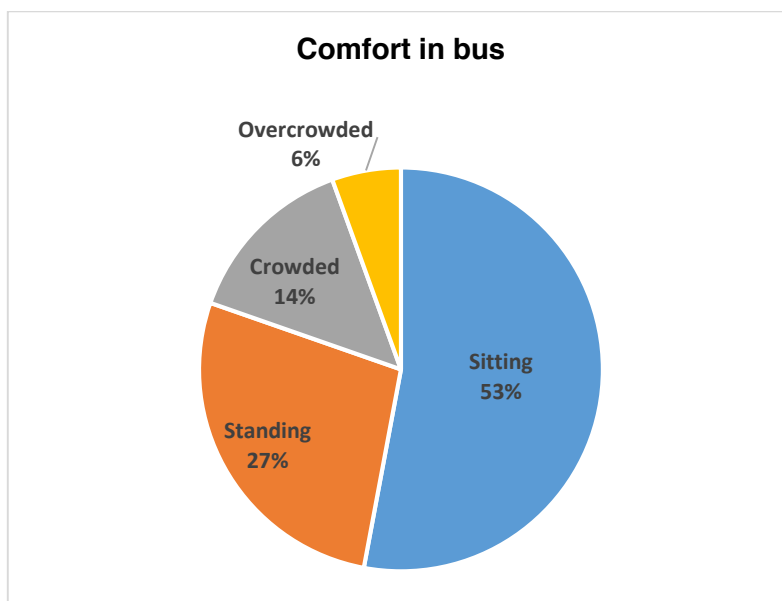
3.9.4 Analysis on Bus users Opinion Survey

Opinion survey has been carried out to understand and evaluate the perspective of bus user regarding existing bus transport facilities and also suggestion upon bus services improvement. A total of 645 samples have been collected covering all city bus routes being operated in the city.

3.9.4.1 Feedback on existing services

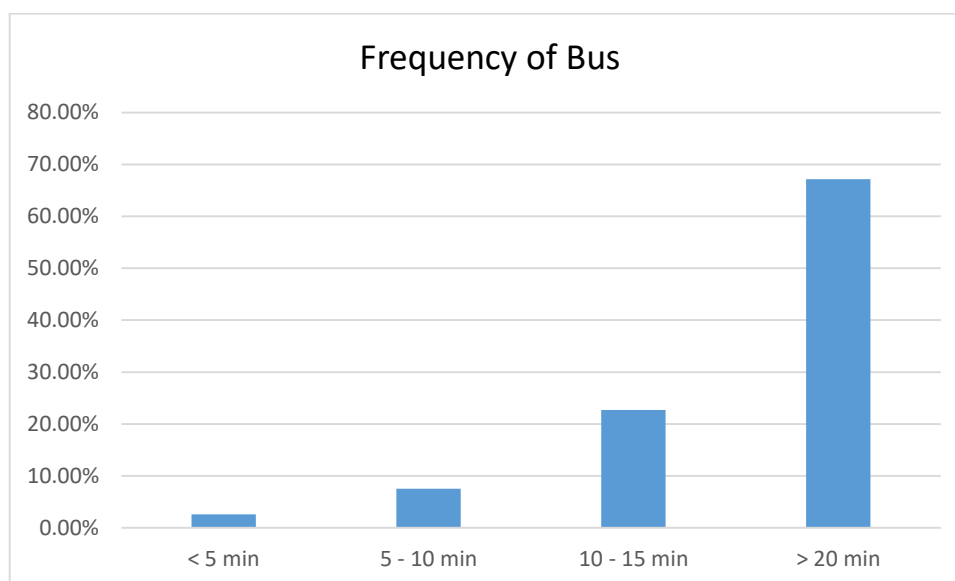
3.9.4.2 Comfort level in bus

From the analysis it was observed that most of the time buses are not crowded. Only 20% of the passengers responded that they travel in either crowded or overcrowded buses. Most of the passengers i.e. around 53% have responded that they occupy a seat in the bus while travelling. As the demand on the routes are less, most of the users are able to get seat in the bus while they travelling. The details of the response of the passengers about their comfort zones in the bus have been shown in the following chart.



3.9.4.3 Users perceptive on bus frequency

The frequency of the bus in the Gurugram has been evaluated from user's perspective. 67% of the passengers responded that the frequency of the buses in the routes which they travel is more than 20 min. Only 10% of the passengers responded that the frequency of bus is less than 10 min. the detailed characteristics of frequency of buses in user's perspective is shown in the following figure.



3.10 Travel characteristics of Intermediate Public Transport Users

The survey was conducted at all the possible IPT Stop (52 locations within 31 routes) with in the study area. A total of 13748 IPT users were surveyed during the IPT on-board OD Survey.

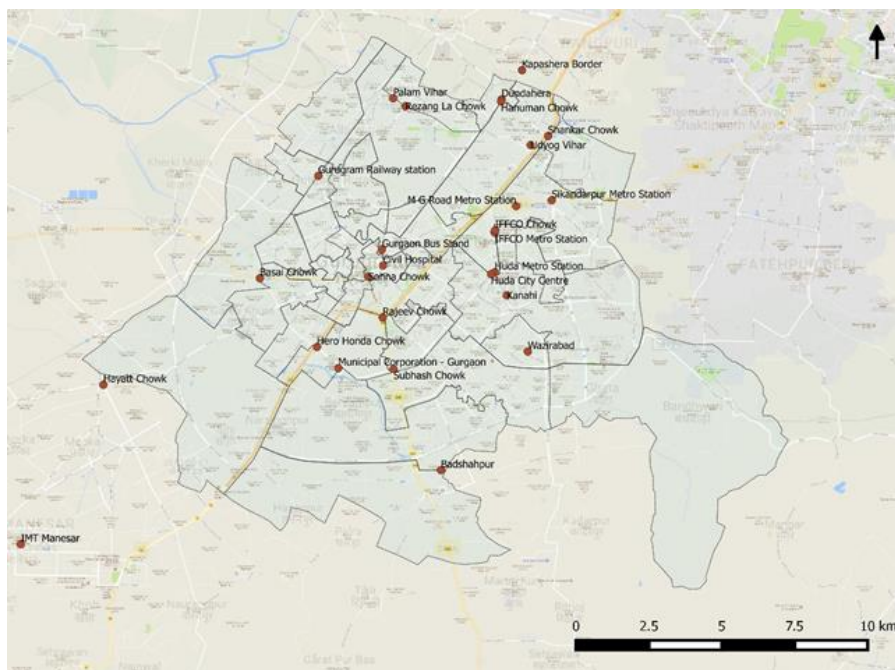


Figure 3-23 : IPT Surveyed Locations

The information obtained from the users during the surveys as listed below.

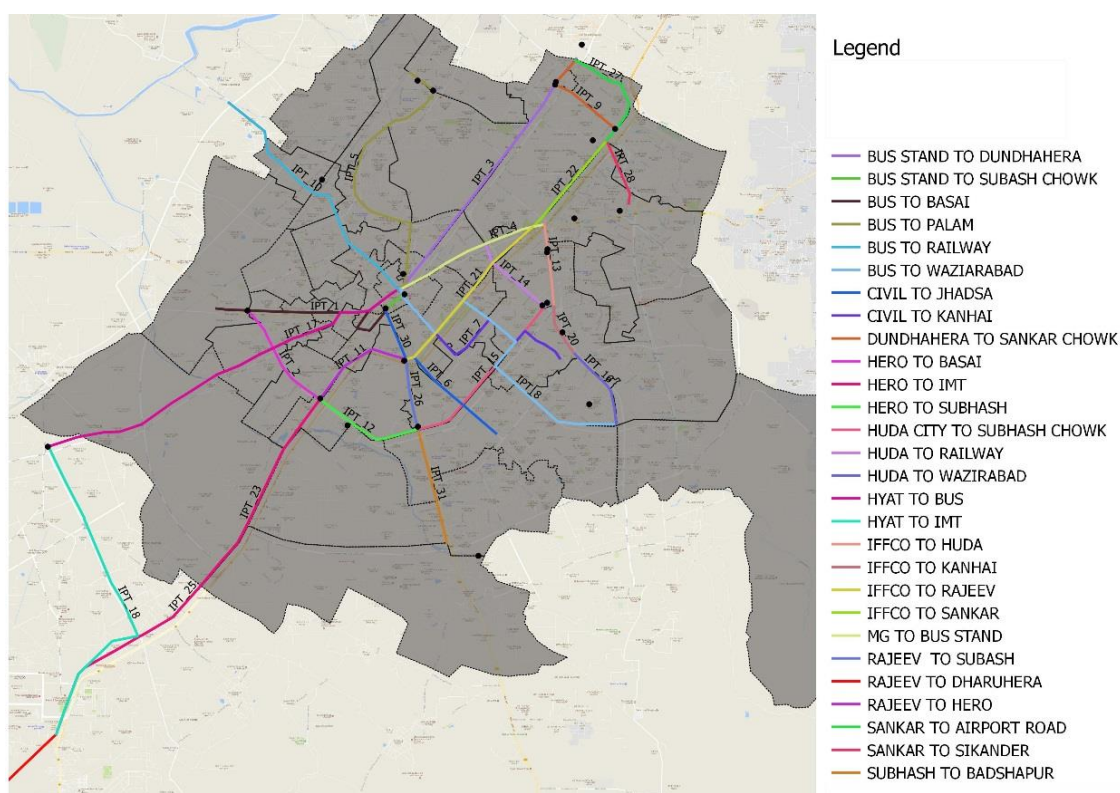
IPT- Survey	Mode choice on Access mode
	Trip Purpose
	Wait time
	Trip length
	Travel Pattern
	Passenger demand

3.10.1.1 Route Length wise IPT Distribution

IPT Route length is broadly categorised into five categories with minimum length of below 3 km and maximum length as above 10 km. Total IPT route length in Gurugram city is 161 km which is 17% in the major road network in the study area. During the time of survey, it was observed that medium route length (3.0 to 5.0 km band) has more no of routes which is about 42.86% in the total routes of IPT operated in the study area, as the route length is reasonable less to cover to have more no of trips and to have a reasonable demand.

Table 3-12 : Intermediate Public Transport Route length distribution

Route Length	% of Route Length km
Below 3.0Km	17.86%
3.0 to 5.0 KM	42.86%
5.0 to 7.0Km	7.14%
7.0 to 10.0Km	21.43%
Above10Km	10.71%



3.10.1.2 Trip Purpose of IPT users

Around 64% of users stated that, they use IPT as commuting mode for work related purpose and followed by social with 14%. It is also observed that the dependency on the IPT is more for the daily commuting trips (work), as the intra PT supply is inadequate/un-reliable in the study area. The figure provided below represents the distribution of IPT users based on trip purpose.

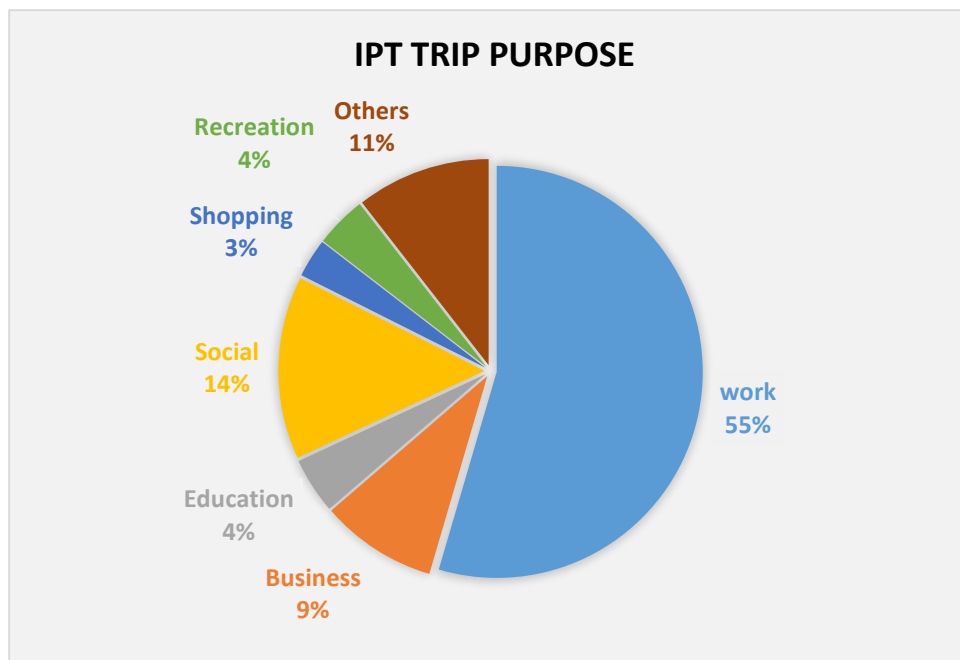


Figure 4-3-24 : Purpose wise Commuter Distribution

3.10.1.3 Composition of access/egress modes of IPT users

Survey questionnaire provides information on mode choice of IPT users to access and egress at the IPT Stands. From results, it is revealed that most of the user's preferable choice is walk which accounting as 69% to reach up to auto stand.

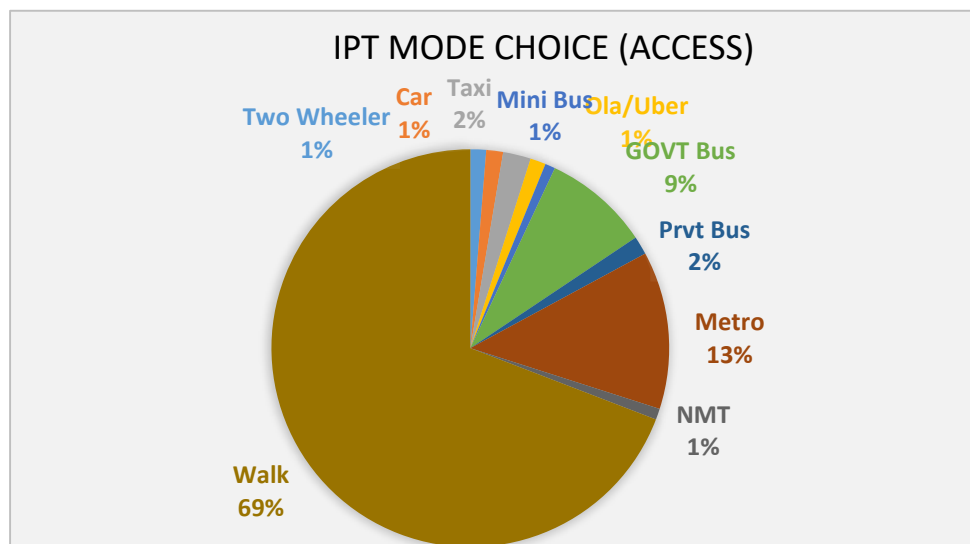


Figure 4-3-25: Access Mode Share

3.10.1.4 Waiting Time at IPT stand

From the survey data, it has been analysed that 57% of the users stated that they have to wait for 2 to 5 Mins and 10% of users stated that they have to wait for 6 to 10 minutes at the stand. The figure below shows the distribution of waiting time at the IPT stand.

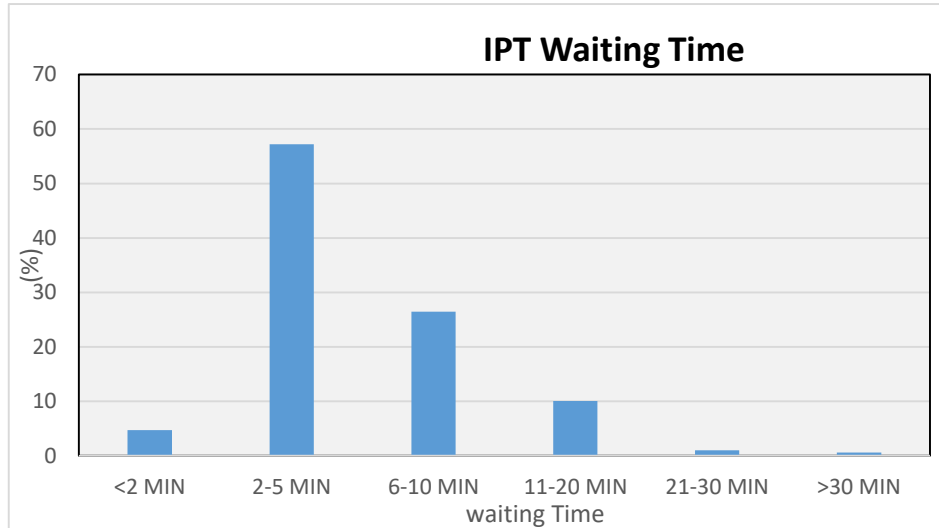


Figure 4-3-26: Waiting Time

3.10.1.5 Route length wise distribution of frequency & wait time

From the survey, all type of IPT routes were covered, to understand the relationship between distributions of route lengths, waiting time and frequency of the users. From the below graph it is observed that, as the route length increases, the frequency and waiting also increases, except in the medium route length category (3.0 to 5.0Km), which has the lesser waiting time with comparing to reaming routes.

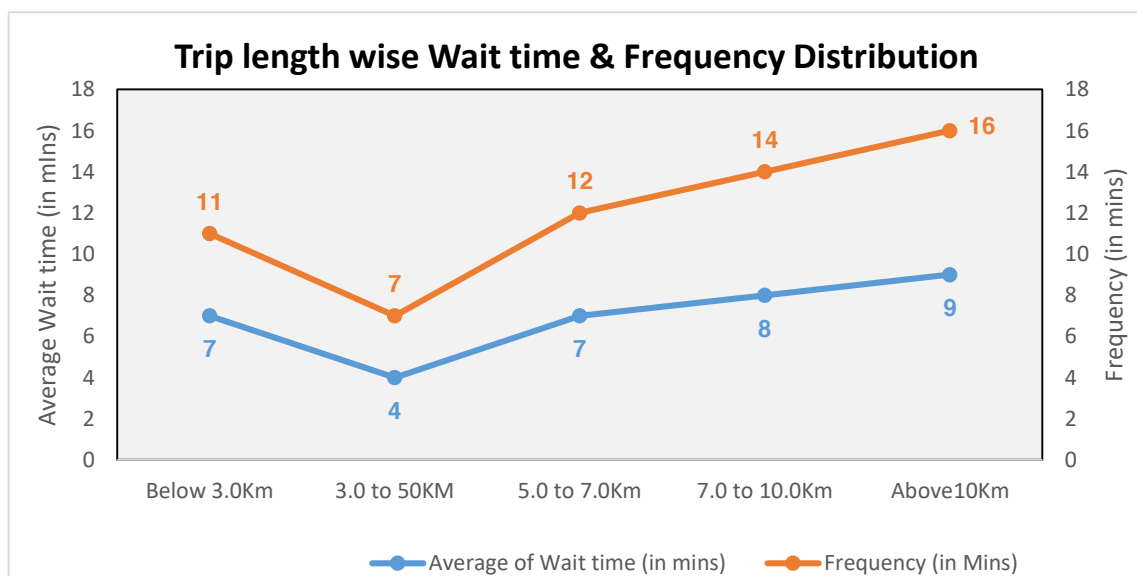


Figure 4-3-27 : Route length wise distribution of Frequency & average waiting time

3.10.1.6 Ridership by Route length category

To understand the route characteristics, a relationship has been developed between the route length and ridership. From the analysis, it revealed that medium route length (3 to 5 km) is having a high demand, as the percentage of routes under the 3 to 5 km route length category is high as shown in **Table 3-12**. The figure below shows the category of route length wise demand.

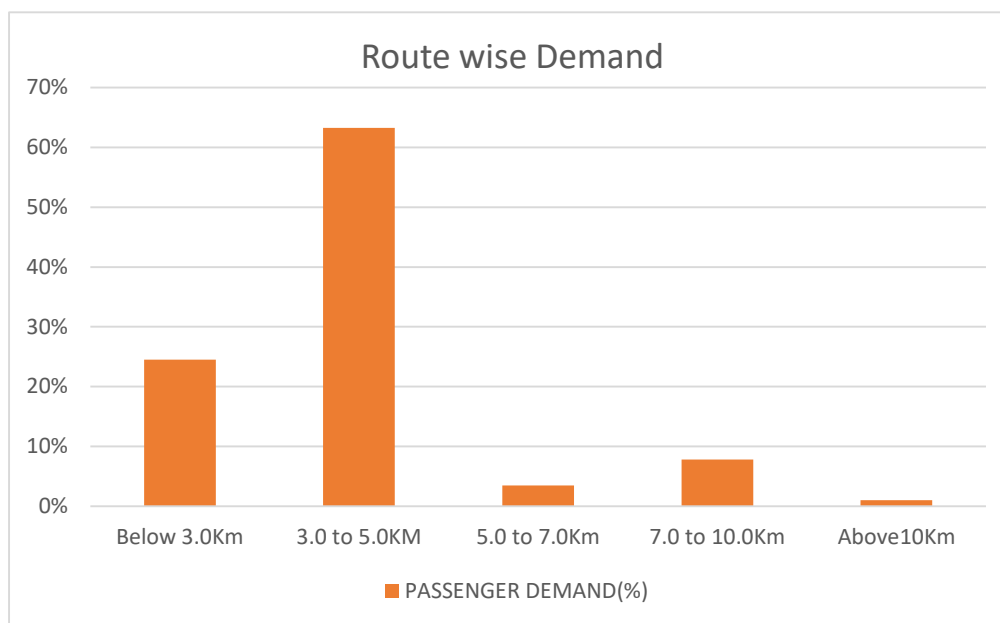


Figure 4-3-28 : Route wise passenger Demand

3.11 Travel Characteristics of Metro users:

The survey was conducted at 16 metro stations of which 5 metro station of DMRC and 11 metro station of DLF rapid metro. A total of 7173 sample was collected from all the metro stations. List of the metro station at which the survey was conducted along with the sample size is shown in the table below.

Metro stations were categorized into two categories work and non-work based on the surrounding land use and the trip purpose of the commuters. Metro station either with surrounding land use predominantly commercial (work centers) or if the trip purpose of more than 70% of the commuters is work then those stations are categorized as work based metro stations and remaining are categorized as non-work based metro stations. Metro station under each categories and sample size collected as per the categories is shown below:

Table 3-13 Metro station categories by activity type

Metro Name	Activity type
CYBER CITY METRO STATION	WORK
MICROMAX METRO STATION	NON-WORK
PHASE-01 METRO STATION	NON-WORK
PHASE-02 METRO STATION	NON-WORK
PHASE-03 METRO STATION	WORK
SECTOR 42-43 METRO STATION	NON-WORK
SECTOR 53-54 METRO STATION	NON-WORK

Metro Name	Activity type
SECTOR 54 METRO STATION	WORK
SECTOR 55-56 METRO STATION	NON-WORK
SIKANDARPUR METRO STATION	NON-WORK
VODAPHONE TOWER METRO STATION	WORK
GURU DRONACHARYA METRO STATION	NON-WORK
HUDA METRO STATION	WORK
IFFCO CHOCK METRO STATION	NON-WORK
MG ROAD METRO STATION	NON-WORK
SIKANDERPUR METRO STATION	NON-WORK

3.11.1 Access or Egress Mode of Metro Users

The OD survey questionnaire provides information on how the passengers arrived at the metro stations and how they reached to their desired destination from the metro stations. The results revealed that, 39% of commuters from the work based metro stations uses auto followed by commuters who prefer to walk are 31% and those take a share auto are 9%

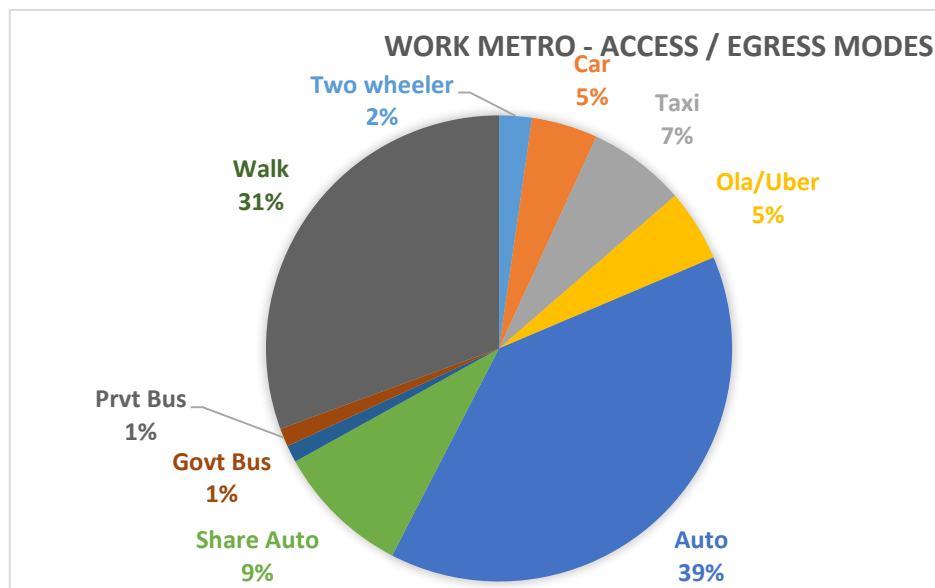


Figure 3-29 Access/Egress modes for work based metro station

The results revealed that commuters from the non-work based metro stations prefer walking are 30 % followed by auto with 25 % and then by share auto with 15 %.

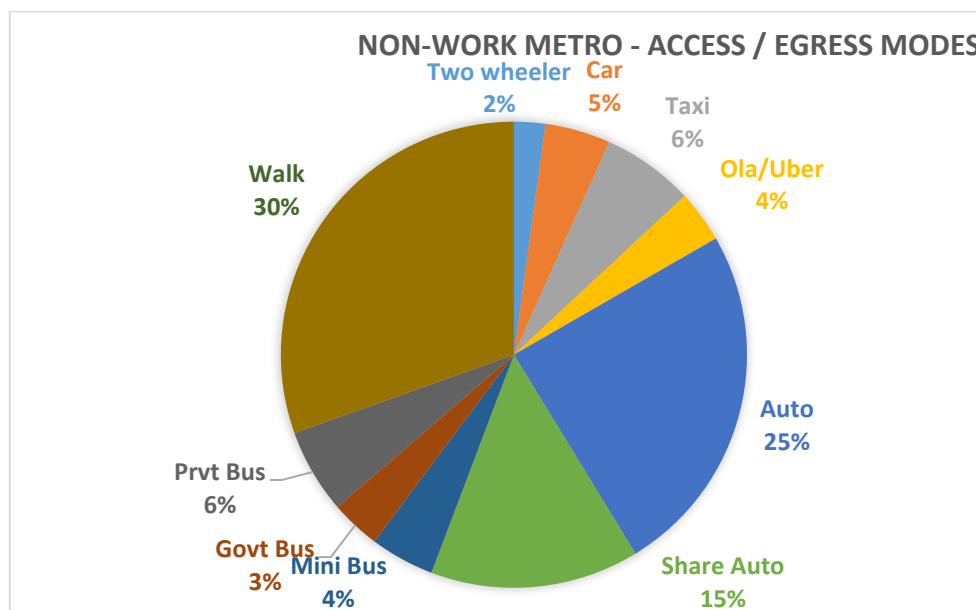


Figure 3-30 Access/Egress modes for non-work based metro station

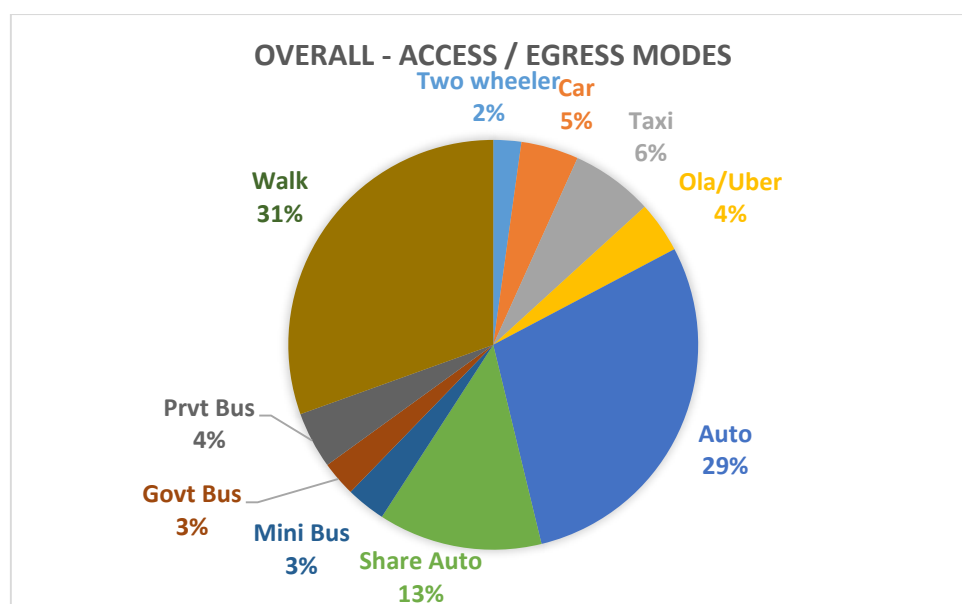


Figure 3-31 Access/Egress modes for metro station

The results revealed that commuters from the metro stations prefer walking are 31 % followed by those take auto are 29 % and then by share auto 13 %. It has observed that about 42 % of the metro commuters are using IPT as access/egress modes which is elevates the necessity of planning the feeder bus services to these metro stations.

3.11.1.1 Trip Purpose of metro commuters:

The OD survey questionnaire provides information about the trip purpose of the commuters at the metro station. Trip purpose information has been analysed based on the metro station categories.

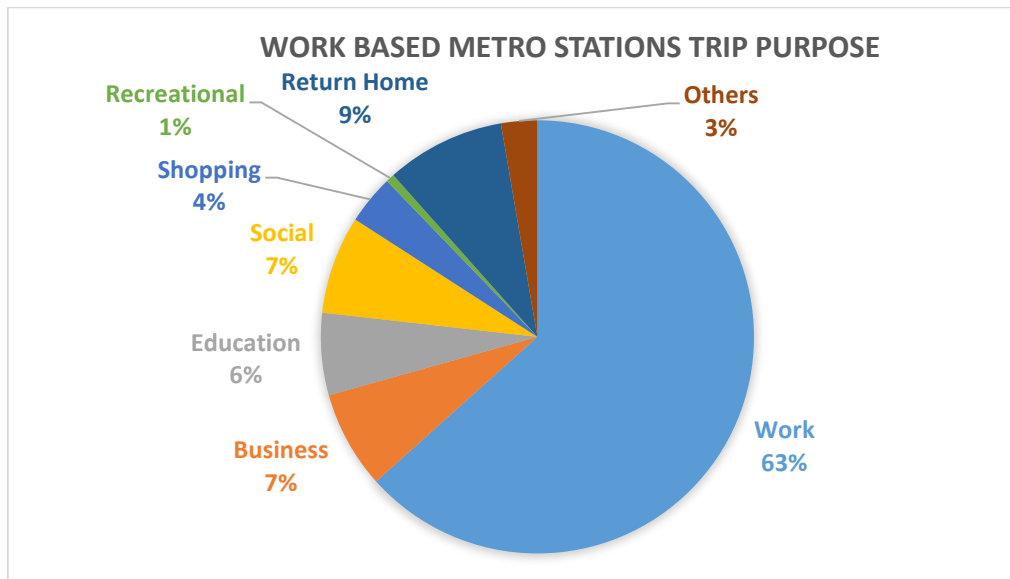


Figure 3-32 : Trip Purpose of work based metro stations

It has been observed that the work based metro stations has about 63 % work trips which depicts that these stations cater majorly to work centres around them.

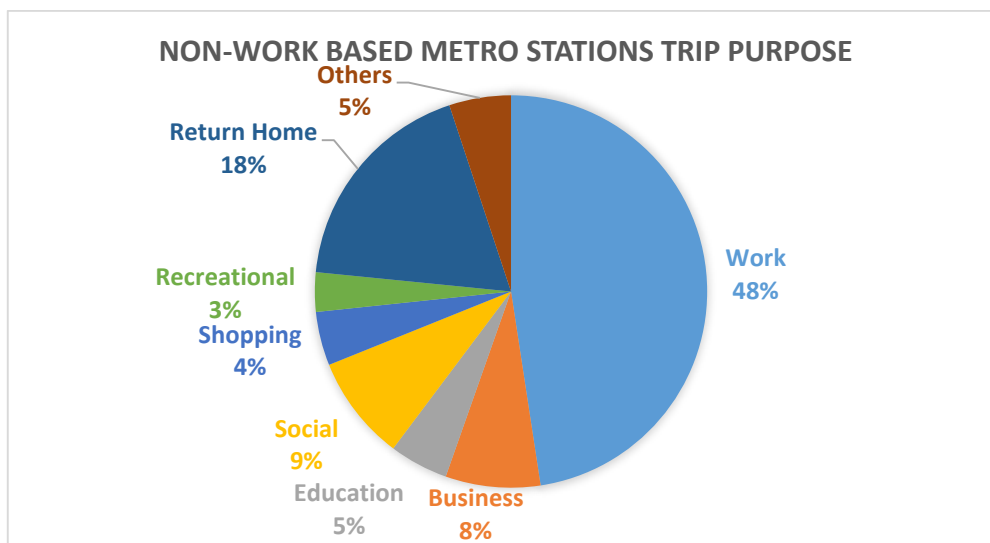


Figure 3-33 : Trip Purpose of non-work based metro stations

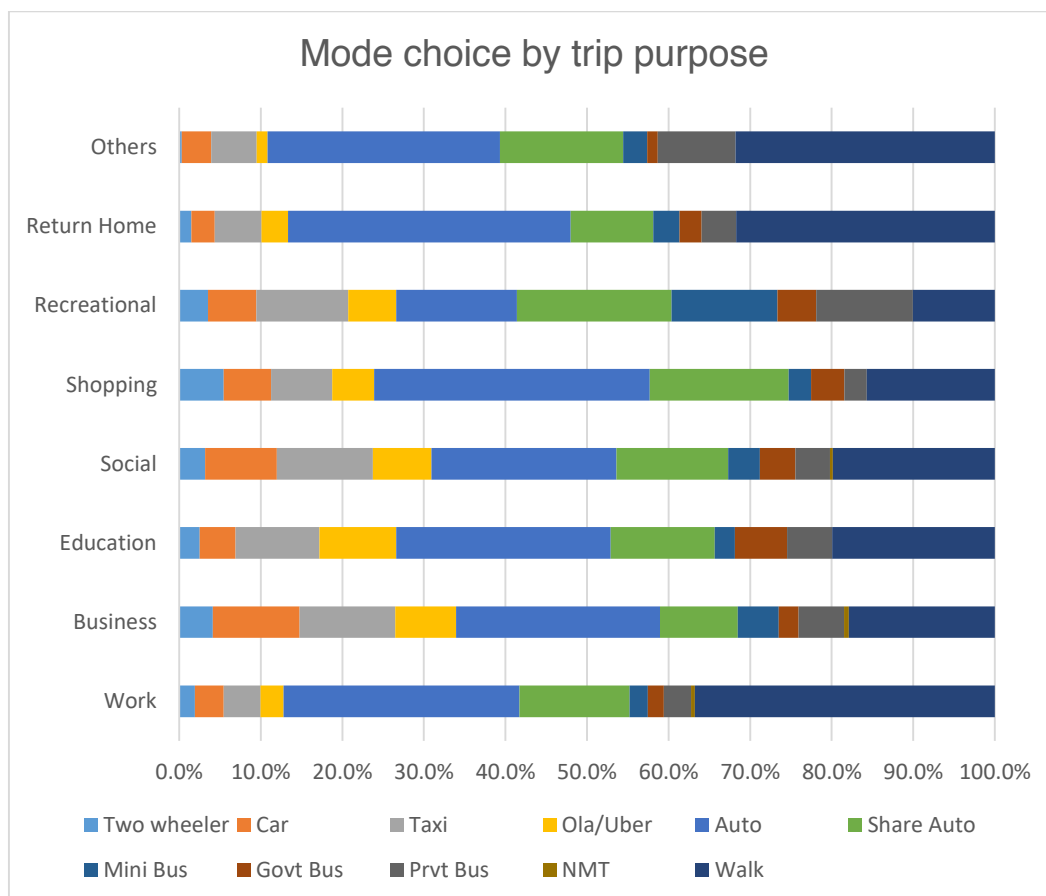


Figure 3-34 Mode choice by trip purpose

It is observed that the IPT is the most preferred mode for any trip purpose, Cars and taxis are preferred modes in case of business/social/recreational trips.

Waiting time for access/egress mode at metro station

It has been observed that the more that 55% of the metro commuters are able transfer to another mode with waiting time less than 10 minutes.

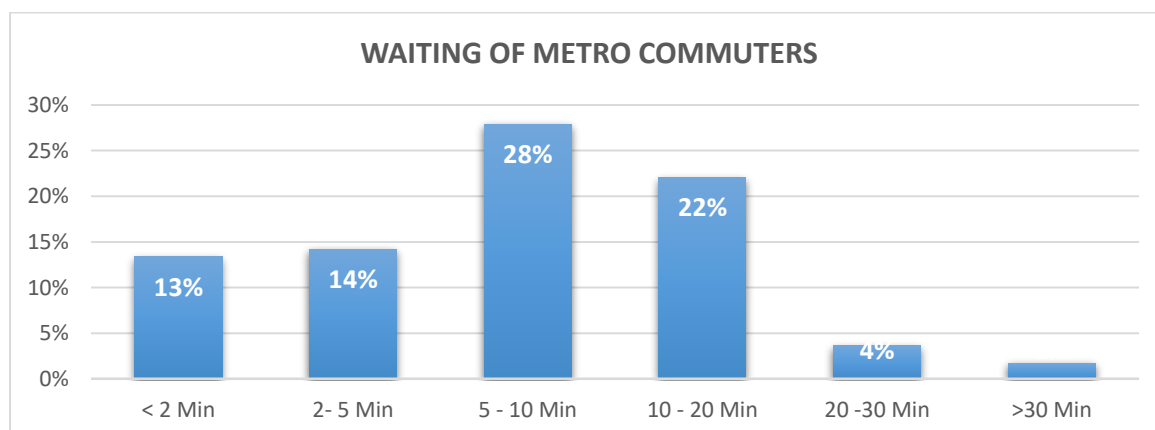


Figure 3-35 Waiting of metro commuters

5 – 10 minutes is the waiting time for the maximum percentage of the metro commuters

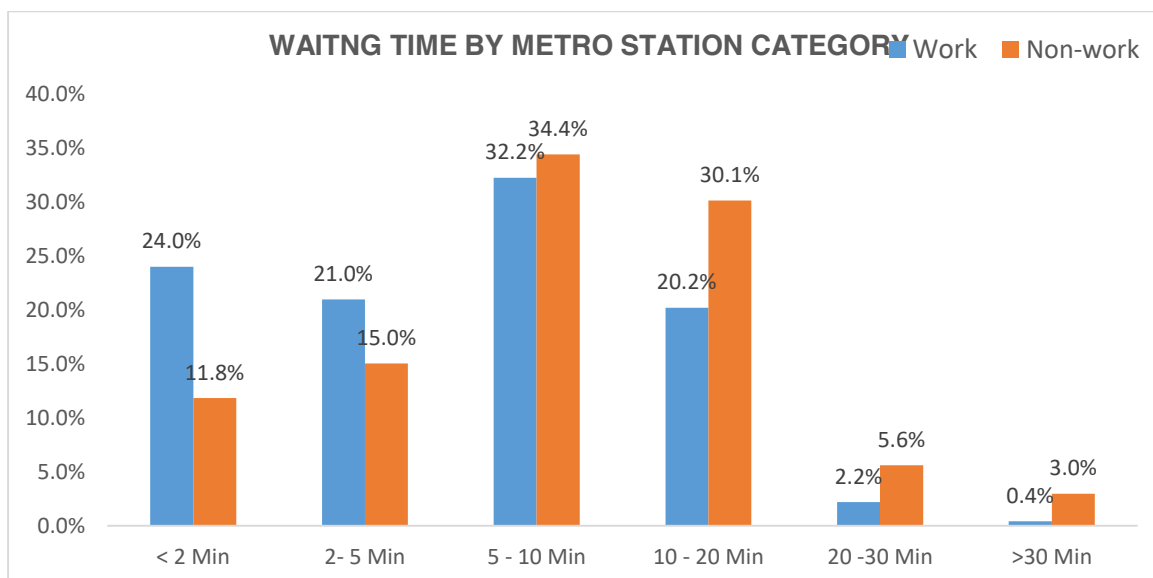


Figure 3-36 waiting time to access/ egress mode by category of metro station

At metro stations categorized into work based station it is observed the waiting time is less than 5 minutes for about 45 % of the commuters where as it is less than 5 minutes for only 27 % of the commuters. It has to be considered while planning the feeder bus services to these metro stations.

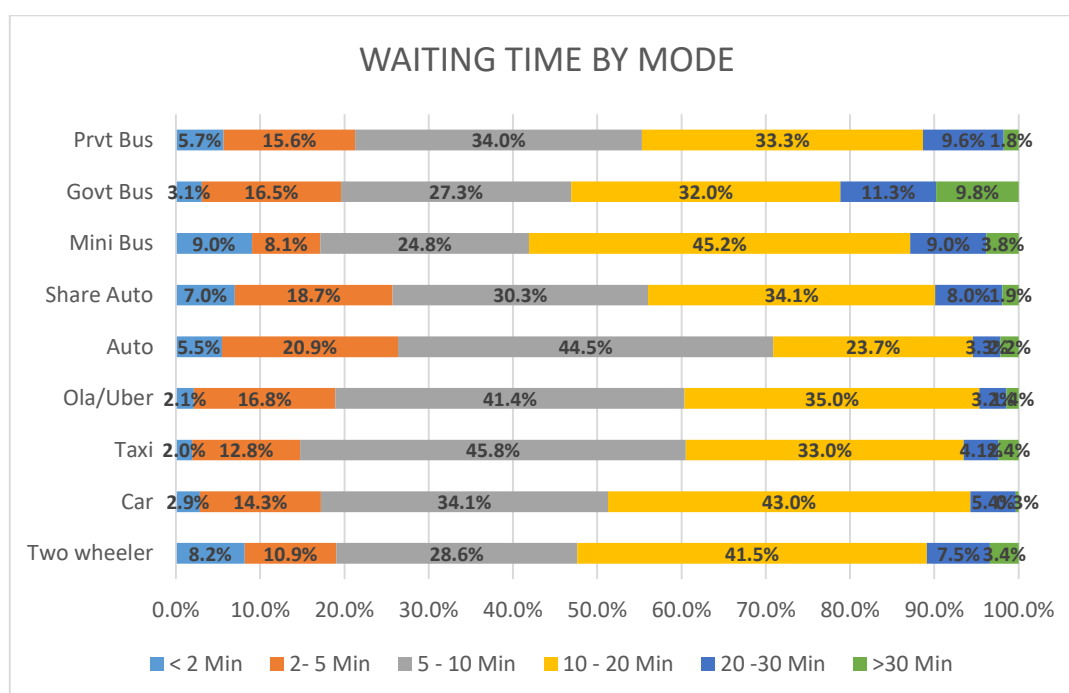


Figure 3-37 Waiting time by Mode Choice

It has been observed that a sizeable amount of passengers (more than 50 %) are having a waiting time of more than 10 minutes in mode like government bus, Minibus and private bus.

CHAPTER 4

Service Level Benchmarking of the city bus services

4 Service Level Benchmarking of the city bus services

Public transport performance indicators are broadly classified into network level performance, operational, financial and customer service. For this study, based on available public transport facilities the performance of the system has been evaluated, as these indicators were frequently used in the Indian studies to evaluate the PT system as per the norms provided in MOUD service level benchmark, urban transport benchmark and JNNURM benchmark.

There are various indicators to understand the Public transport performance in the city. Based on the availability of data and facilities in the study area. The table below shows the indicators were identified and measure for this study to assess the public transport performance levels

Level of performance is broadly classified in four levels where LOS 1 represent high performance and LOS 4 represents low performance.

4.1.1 Indicators for Evaluation of Public Transport Systems

Service Coverage of Public Transport in the City

% fleet size as per urban bus specification

Walking distance(Accessibility)

Average waiting time for Public Transport users (min)

Level of Comfort in Public Transport (Crowding)

Total boarding/ population

Extent of Supply-Availability of Public Transport

High frequency transit accessible area

Vehicle (bus) Utilization

Route overlapping

Average bus stop spacing

4.1.1.1 High frequency transit accessible area (Headway Less than 15 Mins)

The main purpose of measuring this indicator to estimate the population covered under primary influence area (500M) of existing public transport service which have frequency less than or equal to 15mins.

Population has been estimated under 500m buffer along Public transport network in the city using buffer analysis and it has been estimated the service coverage of the study area is 30 As per the norms LoS-4 <40, LoS-3 (40-60), LoS-2 (60-80) and LoS-1 (100). Based on the estimation it was observed that service coverage of public transport in the study area is very low with LoS-4.

4.1.1.2 Service Coverage of Public Transport System

The main purpose of measure this indicator to estimate the population covered under primary influence area (500M) of existing public transport service with irrespective of routes frequency.

Population has been estimated under 500m buffer along Public transport network in the city using buffer analysis and it has been estimated the service coverage of the study area is 0.54 As per the norms LoS-4 <0.3, LoS-3 (0.3- 0.7), LoS-2 (0.7-1) and LoS-1 ≥ 1 . Based on the estimation it was observed that service coverage of public transport in the study area is low with LoS-3.

4.1.1.3 % fleet size as per urban bus specification

This indicator measures, fleet size as per the guidelines provided by Ministry of Urban Development, Government of India. This indicator has been measured based on the number of buses as per urban bus specification within the total number of buses.

As per the norms LoS-4 $\leq 25\%$, LoS-3 (25-50%), LoS-2 (50-75%) and LoS-1 (75-100%) In Gurugram all buses are low floor buses, thus Based on the estimation it was observed as LOS-1 with 100% fleet size as per urban bus specification.

4.1.1.4 Walking Distances(Accessibility)

Average walking distance has been measured from average time taken to reach the bus stop from respective Traffic Area Zone.

As per the norms LoS-1 ≤ 4 , LoS-2 (4-6 mins), LoS-3 (6-10 mins), and LoS-4 (>10 mins) In the case of Gurugram, average walking time taken is observed as 10 mins thus it falls in LOS -3 (which is 6-10 min)

4.1.1.5 Average waiting time for Public Transport users (in mins)

Main purpose of the parameter is to estimate the average time that passengers have to wait for a bus at a bus stop with the standards of MoUD.

As per the norms LoS-1 ≤ 4 , LoS-2 (4-6), LoS-3 (6-10), and LoS-4 (>10), in the study are it has been observed on an average 11 mins waiting time, thus its fall under in LOS-4 (>10 mins).

4.1.1.6 Level of Comfort in Public Transport (Seat Availability)

It measures number of on board passengers and seats available to the passengers during the surveyed hours in any given route of the existing transit system.

As per the norms LoS-1 ≤ 1.5 , LoS-2 (1.5-2.0), LoS-3 (2.0-2.5), and LoS-4 >2.5 ; In the case of Gurugram, the level of comfort is coming 2 which follows in LOS 2(1.5- 2.0) due to low demand on the routes.

4.1.1.7 Total boarding/ population

The number of Passengers boarded the Public Transport Vehicle/ 1000 population.

As per the norms LoS-1 >500 , LoS-2 (250-500), LoS-3 (100-250), and LoS-4 ≤ 100 . In Gurugram it has been calculated as 74 thus its follows in LOS 4 (≤ 100)

4.1.1.8 Extent of Supply-Availability of Public Transport

Availability of PT refers to route possibilities, timings and frequency of organized PT services. Extents of availability of public transport will be defined based on the number of buses available in the study area in a working day and the population of study area. It is observed that Gurugram city is falling under LOS 4 with 0.09

As per the norms LoS-1 > 0.6 , LoS-2 (0.4 – 0.6), LoS-3 (0.2 – 0.4), and LoS-4 < 0.2 , thus its follows in LOS 4(<0.2) Category.

4.1.1.9 Vehicle (bus) Utilization

This indicator shows the utilization of bus in a day. The main purpose of this parameter is to indicate the average kilometres travelled per bus in a day, to recover its cost and maintain efficiency. The vehicle utilization has been calculated by total number of bus trips multiplied with route length by number of buses.

As per the norms LoS-1 > 250, LoS-2 (228 - 250), LoS-3(200 - 228), and LoS-4 <200, for Gurugram it has been estimated 128, which follows in LOS 4 (<200)

4.1.1.10 Route overlapping

Route overlapping is also an important indicator to analyse and understand the PT network. If intermediate routes are overlapping more than 50% of PT network which means the demand is sharing with informal transport.

As per service level benchmarks it should be <0.5 and for Gurugram it has been estimated as 0.2. Which directly shows that most of the IPT system routes overlapping with PT system.

4.1.1.11 Average bus stop spacing

Bus stopping spacing plays an important role to capture the demand.as per standard the average bus stop spacing should be in between 300 to 600-meter and in Gurugram it has been observed 1400 meter.

No.	Indicator	Methodology	Value	LOS	Desired Levels/Standards	LOS Levels	Source
1	Service Coverage of Public Transport in city	Total population under 500 m buffer along Public transport network= A	0.54 – PT 0.61- PT & IPT	LOS 3	>=1	1	MoUD, Service Level Benchmarks for Urban Transport
		Total population of the city= B			0.7-1	2	
		Total study area = (A/B)			0.3-0.7	3	
					<0.3	4	
2	% of Fleet Size, as per Urban Bus Specification	Total number of buses in the city = (a)	100%	LOS 1	75-100%	1	MoUD, Service Level Benchmarks for Urban Transport
		Number of buses as per urban bus specification = (b)			50-75%	2	
		% of Fleet, as per Urban Bus Specifications = (b/a) *100			25-50%	3	
					<=25%	4	
3	Walking Distances(Accessibility)	Average time taken to reach the bus stop from respective TAZ zones	10min	LOS 3	<=4	1	Service Level Benchmarks for Urban Transport, MoUD
					4-6 mins	2	
					6-10 mins	3	
					>10 mins	4	
4	Average waiting time for public transport (min)	Identification of routes wise average headway in peak hours at identified bus stop	10min	LOS 4	<=4	1	Service Level Benchmarks for Urban Transport, MoUD
					4-6	2	
					6-10	3	
					>10	4	

No.	Indicator	Methodology	Value	LOS	Desired Levels/Standards	LOS Levels	Source
5	Level of comfort in Public Transport(crowding)	Average passenger on-board on bus surveyed for each of identified route.	2	LOS 2	≤ 1.5	1	Service Level Benchmarks for Urban Transport, MoUD
		B. Number of seats in bus surveyed for each of identified route.			1.5-2.0	2	
		Passengers per seat=A/B			2.0-2.5	3	
					>2.5	4	
6	Total boarding /population	total boarding = (a)	73	LOS 4	>500	1	Service Level Benchmarks for Urban Transport, MoUD
		Population of the study area = (b)			250-500	2	
		Total boarding/ 1000 Population =(a/(b/1000))			100-250	3	
					≤ 100	4	
7	Extent of supply/availability of PT transport	No of Buses available in a city on any day (a)	0.09	LOS 4	≥ 0.6	1	Service Level Benchmarks for Urban Transport, JNNURM
		Total Population of the study area (b)			0.4 – 0.6	2	
		Availability of Public transport /1000 population = (a/b) *1000			0.2 –0.4	3	
					< 0.2	4	
8	High frequency transit accessible area	Population = (a)	30	LOS 4	≥ 80	1	Service Level Benchmarks for Urban Transport, MoUD
		population under 500m buffer of bus stops having effective headway less than 15mins effective headway= (b)			60-80	2	
		High frequency transit accessible area= (b/a) *100			40-60	3	
					< 40	4	
9	Vehicle (Bus) Utilization	Total running km of all buses in a day = A	128	LOS 4	> 250	1	Service Level Benchmarks for
		Total number of buses on roads = B			228 - 250	2	

No.	Indicator	Methodology	Value	LOS	Desired Levels/Standards	LOS Levels	Source
		Running km of a bus on a day = A/B			200 - 228	3	Urban Transport, MoUD
					<200	4	
Overall City Level public transportation (Bus system) performance *				LOS - 3			
* Assuming every parameter has equal weightage							
10	Route Overlapping	Total route length of PT/ total PT network length	0.2		Should be <0.5	—	Transit network design and scheduling: a global review, Guihaire & Hao
11	Avg. Bus stop spacing	Total PT network length/ total no of bus stops	1400m		300-600m	—	Bus services reducing cost, rising standards, world bank technical paper, Armstrong-write & thriez, 1987

CHAPTER 5

Recommendations on Bus Route Planning & Rationalization

5 Recommendations on Bus Route Planning & Rationalization

5.1 Background

For bus route planning and rationalization, demand for travel of users is determined and existing supply of transport system through existing bus system along with all other available public transport modes were analysed.

Development of an efficient and reliable bus network system for Gurugram would require multi-level strategy for improvement in existing routing patterns, alignments and operations apart from adding new services for unconnected areas. As part of this process, hierarchical bus route network has been proposed for city based on various requirements derived from the study from user, operator and authority perspective

This chapter briefly explains about the methodology adopted for bus route planning & rationalization based on the analysis of existing travel demand and pattern, users' opinion and service level benchmarks.

5.2 Bus Route Generation Approach

Bus Route Generation Process included following:

1. In first step of bus route generation process, demand assessment has been done based on large data collection from field surveys (origin/destination surveys) done at household level.
2. The demand generated from surveys was assigned on to transport network of Gurugram using sophisticated public transport tool (VISUM software) to determine major corridors of demand.
3. In next step, on all potential demand sections, flow bundles were plotted which provided the flow of passengers along particular corridors indicating potential bus route alignment.
4. In this step, Bus routes were coded on potential alignment and public transport assignment was run to determine if proposed route alignment is feasible or not and receiving sufficient ridership along route.
5. All feasible bus route alignment were then clubbed (wherever required to make route length as per minimum level) to make viable bus route system
6. Overlaps are removed and their connectivity with major trip generation centers (major office complex, market areas, transport nodes) checked
7. Subsequently based on characteristics of routes, these were classified as Trunk, Primary, Secondary and Feeder.

Category	Details
Trunk Routes	High Demand Routes, operate on major network of city, connect major economic centres and will require high frequency operation. City will look for prioritisation of these routes for public transport operation by Bus lane, queue jumping lanes etc.
Primary Routes	Moderate Demand Routes, Operate both on primary & secondary network and will require moderate frequency
Secondary Routes	Low Demand, operate mainly on secondary network and some narrow and congested routes, connects, suburbs, low density areas etc. and will require relatively lower frequency (also smaller bus size)
Feeder/IPT Routes	These routes will run in residential areas, from metro stations and in low density areas and mainly operated through smaller vehicles/paratransit

Bus Route Rationalisation Process included following:

1. Once set of bus routes are identified from public transport modelling then these routes were compared and analyzed with reference to existing bus routes operating in the city.
2. Based on analysis, existing routes were grouped under following category:

Route Category	Details
No Change Routes	These existing routes will require no structural change. These have unique catchment, good demand potential and very limited overlap with other services. Only frequency adjustment could be needed in these routes.
Modified Routes	These routes will require extension and curtailments based on demand analysis, overlap analysis and transfers
Merge Routes	These are inefficient routes which have no unique catchments and have very high overlap with other services. These routes will be merged to simplify public transport network

Recommended Service & Operation Plan

- Once Routes are planned and rationalized, based on demand levels and type of routes, service frequency and fleet is identified

Recommended Market segments

- After service levels are defined, various types of services is also recommended

Route development methodology is shown in Figure below.

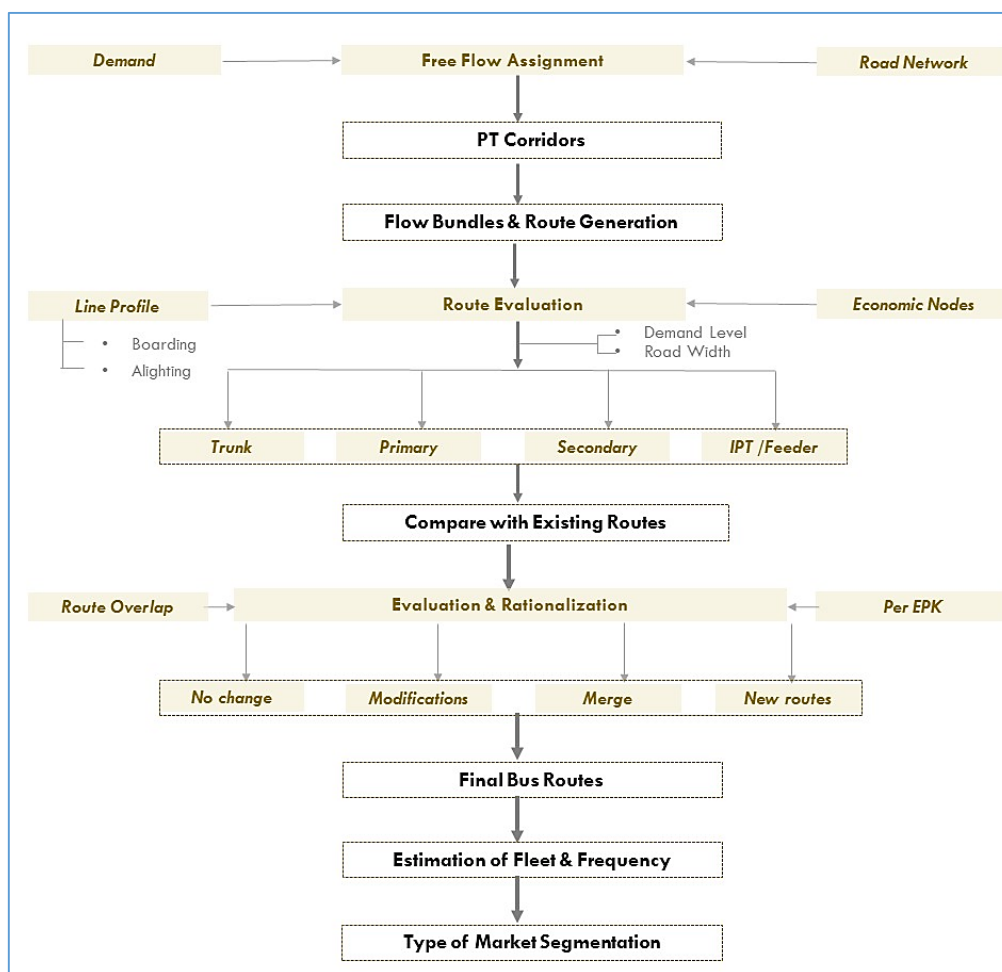


Figure 5-1 : Approach Methodology adopted for Bus Route Planning & Rationalization

5.3 Bus Route Generation Process

5.4 Data Preparation Stage

A comprehensive data collection was done from field studies and secondary sources on travel pattern of users, existing bus route characteristics, city transport network, travel demand and related socio-economic data. Travel data was collected through:

- Household Travel Surveys
- OD of Bus & IPT passengers
- OD surveys for Private vehicle users,
- OD at work centers
- Online Surveys

Collected data was analysed to create mode wise trip demand matrices which was subsequently utilised for assessment of public transport demand levels. Matrices were imported in VISUM software.

A comprehensive transport network map was created in VISUM after coding road network, bus & IPT routes as well as existing metro services

5.5 Assignment of Trips on Network

Demand matrices created in Visum were assigned incrementally on transport network to determine, major corridors of travel in city. The screenshot of assigned trips on transport network is shown in Figure below.

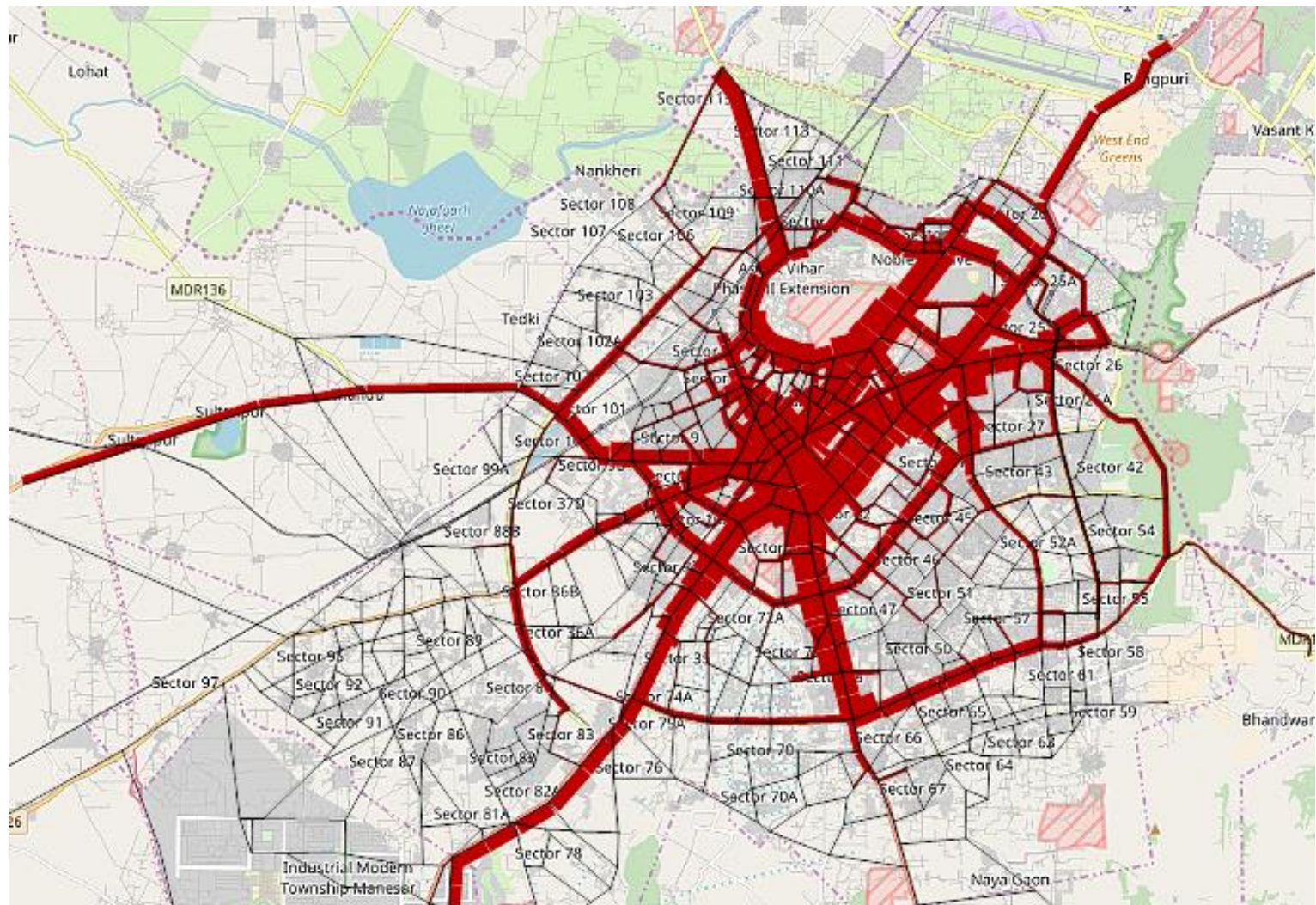


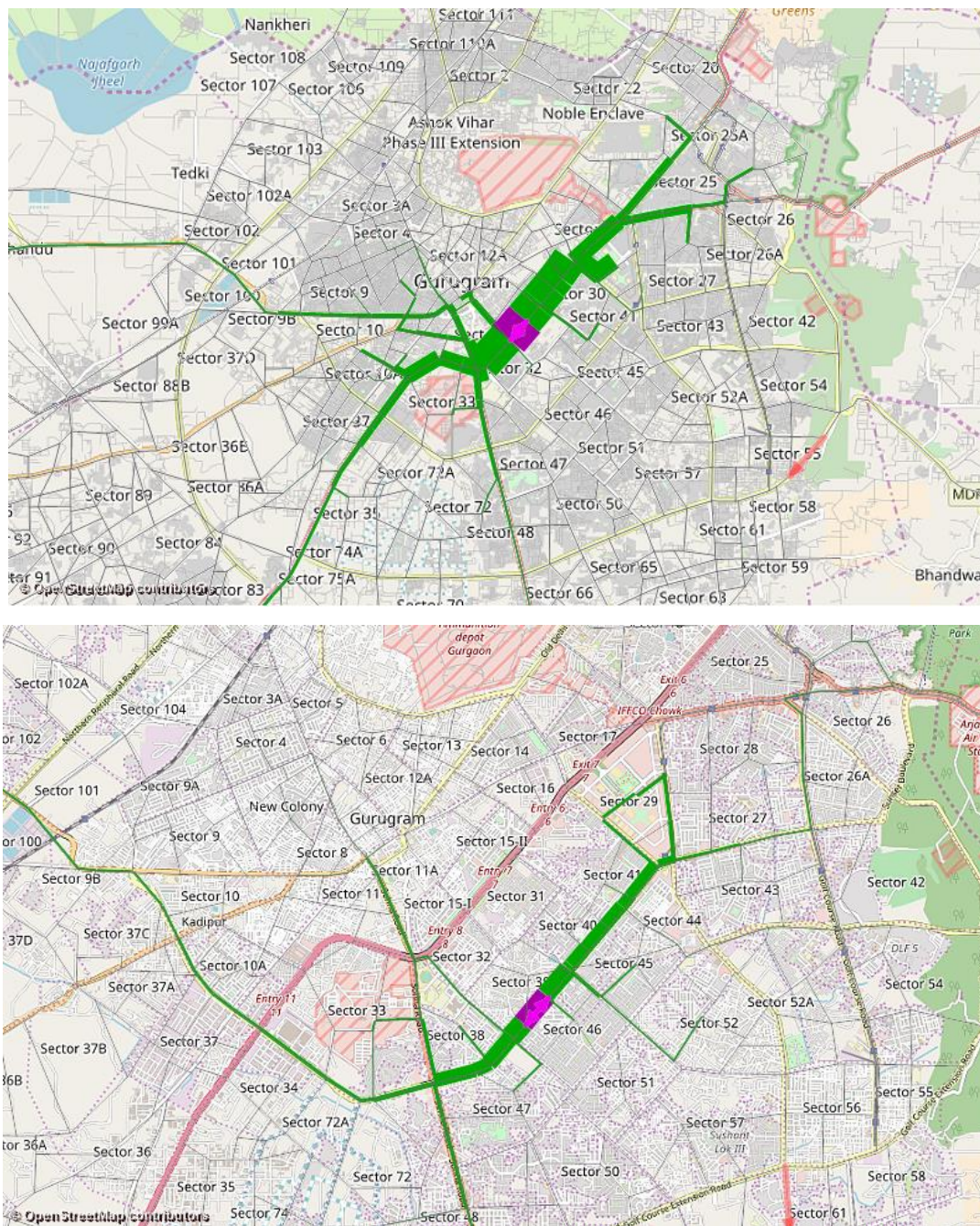
Figure 5-2 : Trip Assignment of Gurugram

5.6 Flow Bundle Analysis and Route Extraction

The bus route generation process included assignment of the existing trip matrices to existing network and then conducting flow bundle analysis (select link analysis) on various travel corridors for identification of routes in the study area. Flow bundle analysis has been used to trace the path of users along various travel corridors on transport network. In this process, a large number of routes were generated between various pair of origin and destination zones in the study area subject to certain restrictions of network.

Routes generated in flow bundle analysis stages were aggregated to merge subset routes and also some of the smaller routes were grouped to form single viable bus route. The aggregated route system was utilized for further analysis.

The below figure shows the flow bundle analysis in VISUM software



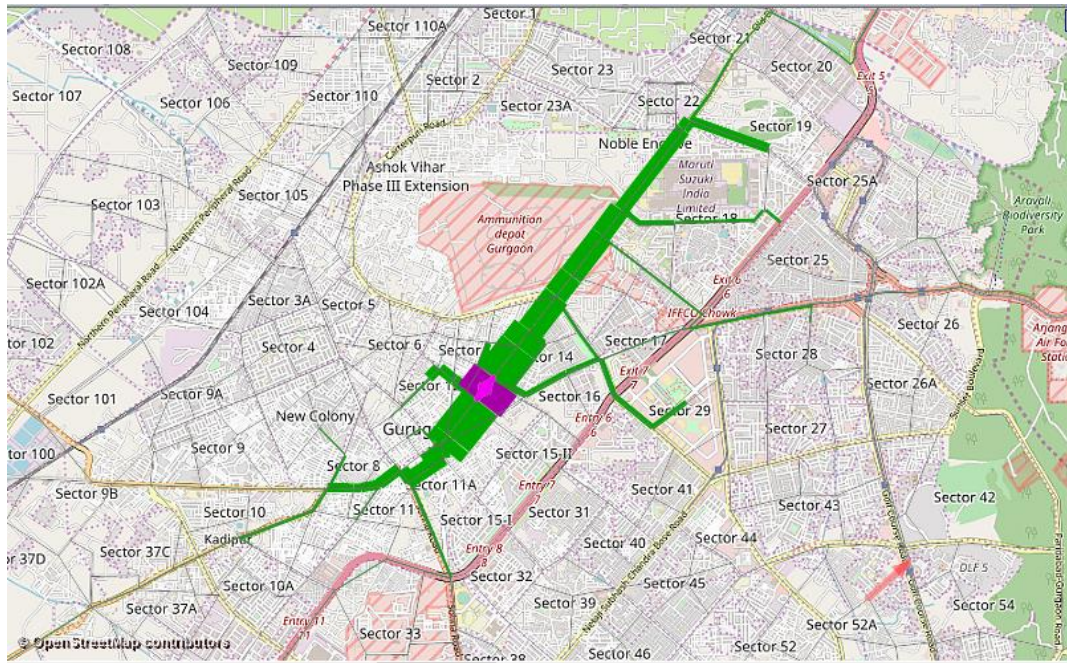
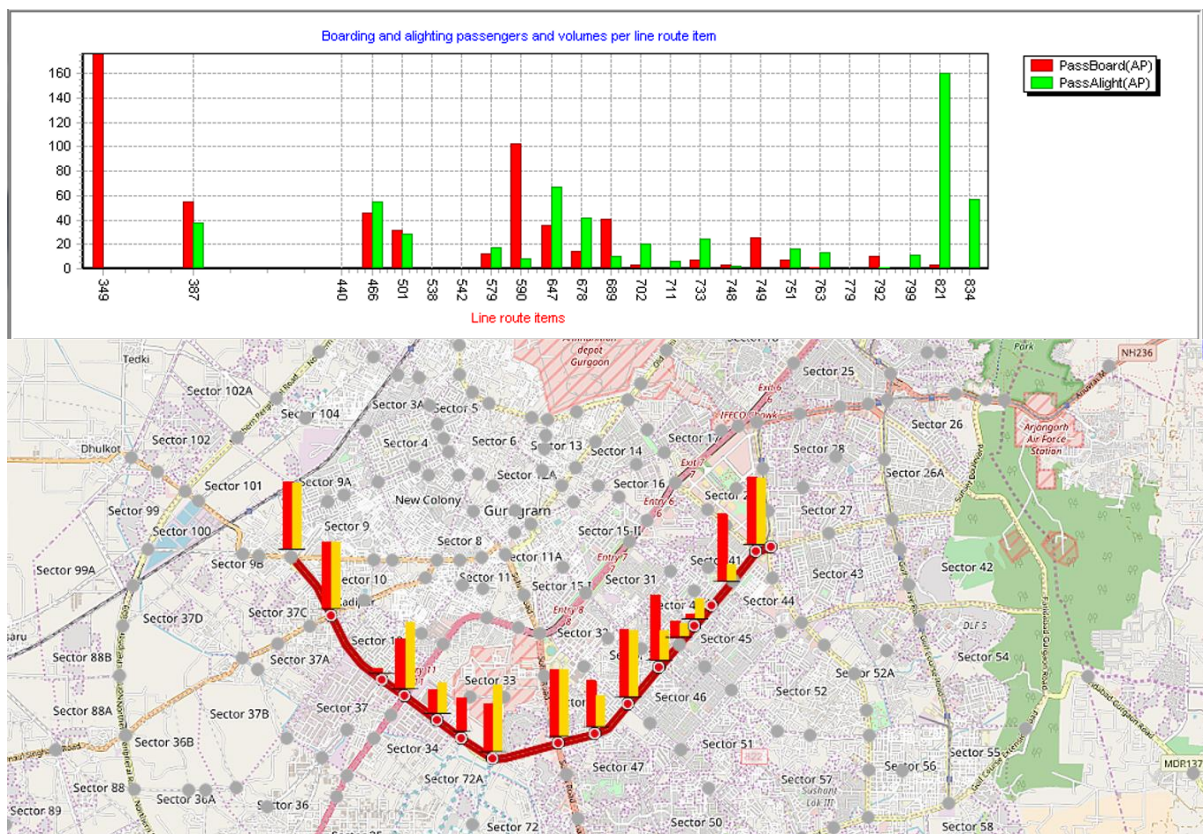


Figure 5-3: Flow Bundle Analysis using VISUM (Trip Movement)

5.7 Route Evaluation

Bus route generated through flow bundle analysis were coded in VISUM software after coding potential bus stop and frequency to determine potential boarding's and line profile along existing routes.

Routes which are getting reasonable assignment of trips (\Rightarrow 3000 passenger/day) and consistent line profile were selected as viable route. A Line profile of selected route is shown below.



5.8 Route Planning & Rationalisation –Recommendation

Route generated through public transport model were compared with existing operational routes to evaluate their efficiency in terms of connectivity with passenger travel desire patterns, financial parameters such as EPKM etc. These parameters included

- Passenger Demand levels
- Route commercials in form of EPKM
- Route Overlaps

Based on above analysis, all existing routes are categorised in following three categories.

Category	Details
No Change Routes	No structural change is required as these routes follow passenger desire line and doing fine in terms of financial parameters. These routes will be retained with some adjustment in frequency
Modified Routes	Part of these route alignments will require modification to match passenger desire lines and also to improve its financial efficiencies. Alignment change is suggested in terms of curtailment or extension of route based on trip desire pattern
Merged Routes	These routes are considered inefficient as having very high overlaps with other system. Provide no advantage to public transport network of city and make it complicated and also doing poorly in terms of financial parameters. These routes will be merged as they are performing low in all the parameters.

Based on the analysis and evaluation of existing routes, good performing routes are retained, medium level performing routes are modified and new routes are planned with connecting to major nodes/areas. The table and figure below shows the list of routes by categorisation.

Table 5-1 : Existing Route Rationalisation Proposals

Modification Type	Existing Route Name	Modifications
No Change in Route	Huda city centre to Badshahpur via Subash chowk	No Change in Alignment
	Bus stand - Anand Vihar	
	Gurugram - Karol Bagh	
	Gurugram – Farrukh nagar	
	Huda city centre - Dharampuri	
	Gurugram to Heli Mandi	
Modified Route	Gurugram - Kendriya Vihar	Alignment Has been Changed
	Gurugram - Dundahera	Modification by continue route in old Gurugram road
	Gurugram - Palam Vihar	Route curtail and modified by route start point from IFFCO Chowk
	Huda city centre to ESI Hospital	Route extended up to Btasai Chowk & Change in alignment Via Sec 31 & 41
	Huda city centre - Sohna	Route alignment modified by connecting to Bus stand
	Huda city centre - Hero Honda chowk	Loop Route is proposed which connects railway station, IFFCO Chowk, Huda City center
	Bus stand to Green field colony	Route curtail and started from Sector 61
	Huda city centre to Vatika	Route extended up to Sikanderpur
	Gurugram to Pataudi	Route Curtail at Bilaspur Kalan
Merged Route	Huda city centre to Badshahpur via Kanahi	Merge with Badshahpur route Via Subash Chowk
	Bus stand to Mudrika sewa 1	Merge the route with Badshapur and change in the alignment part of where overlap with Metro
	Bus stand to Mudrika Sewa 2	Route merge with Badshapur & Railway station

Modification Type	Existing Route Name	Modifications
	Huda city centre to Railway station	Merged with Huda city center to Dharmapur
New Routes	IFFCO Chowk to Badshahpur	Recommended - New Routes
	Manesar to Railway station	
	Gurugram Bus stand to Dhaul kaun	
	Sector 88A to Palam Vihar	
	Rajeev Chowk to KIIT College of Engg.	
	Sector 2 to Ghata Village	
	Sector 2 to Sector 6A	
	Gurugram Bus stand to Ansal university	
	IFFCO Chowk to Palam Vihar	
	Sector 97 to Badshahpur	

5.9 Bus Route Hierarchy – Recommendation

Rationalised routes together with new routes identified for the study were classified into three categories as per importance of routes and ridership levels. Trunk routes are defined as highest order routes which will run on major demand routes with high frequency connecting major demand centres. Primary routes will be of second order in terms of demand and will operate on primary and secondary network. Secondary routes are those having lower ridership and also passing through relatively low capacity roads and low density areas. Regional connectivity routes are those which provide connectivity to the areas outside Gurugram Metropolitan Area. It is also suggested that to reduce complexity in operation, initially regional routes could be operated on the alignment falling within GMDA area and later could be extending for outer areas beyond GMDA. Details are given in table below.

Table 5-2 : Proposed Route Hierarchy

Route Type	Route Name	Route length (in km)	Approx. Road width (in Meters)
Trunk Routes	Gurugram Bus stand to Bilaspur kalan	30	34
	Harsaru to Dundahera	11.9	20
	Huda city center to Dharamपुर	13	E 18 M 20 M 12 M18 M 20 S22
	Sector 2 to Ghata Village	19.7	S12 E30
	Basai Chowk to Huda city center (Via GBS)	11.9	26
	Sohna to Railway station	21.7	S28 E18
	Manesar to Railway station	26	S20 M16 E18
	Total Trunk route length	134.2	
Primary Routes	Huda city center to Huda city center (via Hero honda chowk, Railway station)	25.1	S26 M10 E18
	Gurugram Bus stand to Farrukh nagar	19.5	18 & 12
	Gurugram Bus stand to Ansal University (Mayfield Garden)	13.9	S15 M15 E10
	Sikanderpur Metro station to Sector 75A	16.2	S40 M12 E30
	IFFCO Chowk to Badshahpur	12.2	S30 M15 E28
	IFFCO Chowk to Palam Vihar	12.6	S20 M12 E8
	Sec 56 to Dundahera	16.3	S32 E24
	Gurugram Bus stand to Palam Vihar	10.5	S10 M15 E24
	Total Primary Route Length	126.3	
Secondary Routes	Huda City Center to Maruti Kunj (Via Badshahpur)	13.2	S 18 & E27

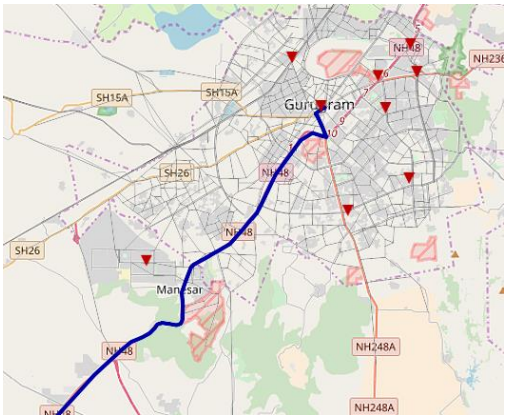
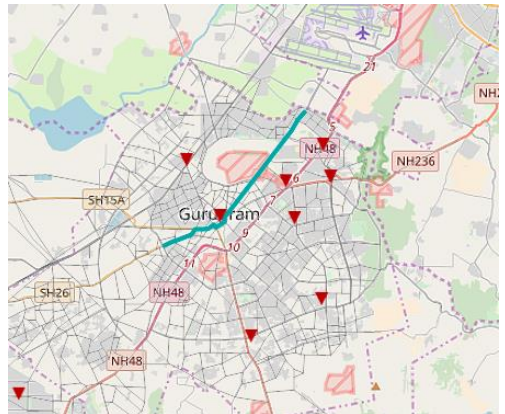
Route Type	Route Name	Route length (in km)	Approx. Road width (in Meters)
	Sector 97 to Badshahpur (Via IMT Manesar)	20.7	S24 M34 E30
	Sec 2 to Sec 6A	9.3	S 8 M12 E 18
	KIIT College of Engg to Rajeev Chowk	14	10
	Sector 88A to Palam Vihar	15.1	33
	Total Secondary Route Length	72.3	
Regional Routes (Connecting outside Gurugram Metropolitan Area)	Gurugram Bus stand to Dhaulkaun	17.4	40
	Gurugram Bus stand to Anand Vihar	48	30
	Gurugram Bus stand to Karol Bagh	31.5	40
	Harsaru to Heli Mandi	22.6	14
	Sec 61 to Green Filed	27.2	33
	Total Regional connectivity Route Length	146.7	
Grand Total of all Routes length		479.2	

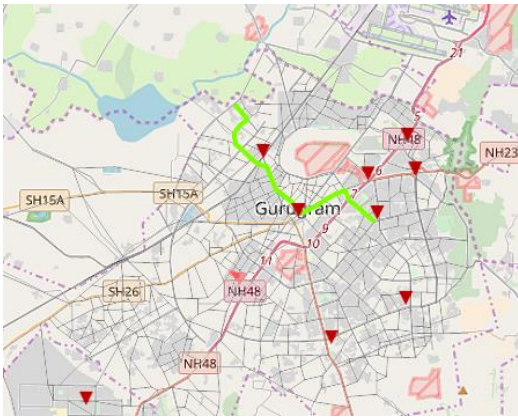

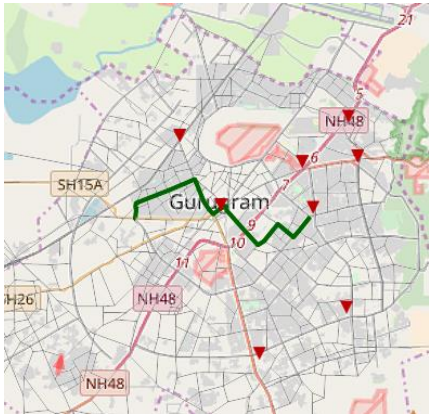
GBS: Gurugram Bus Stand

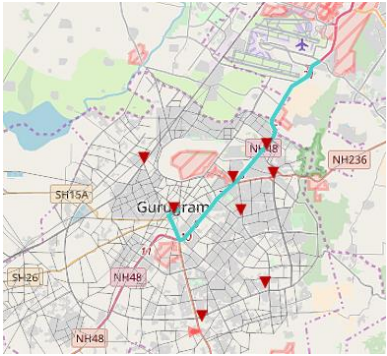

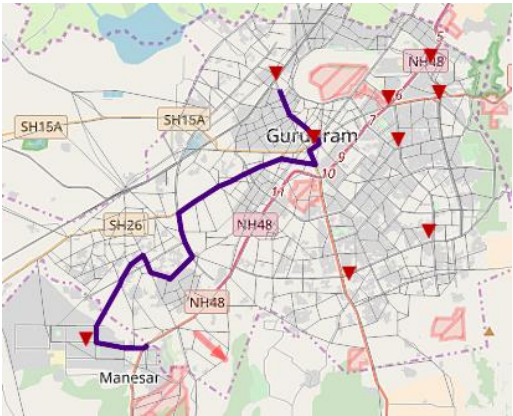
S: Start, M: Middle E: End

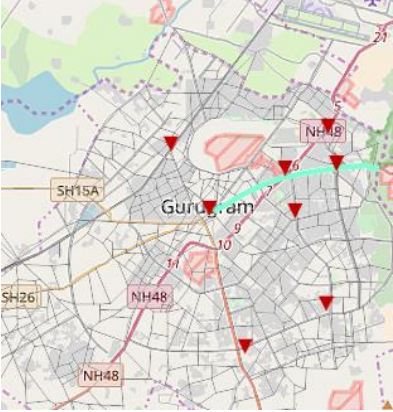

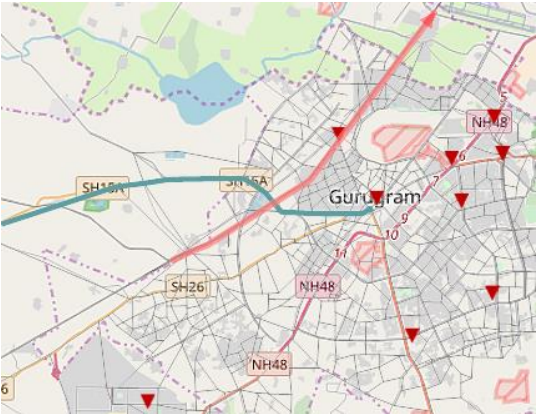
These routes are further detailed in subsequent sections



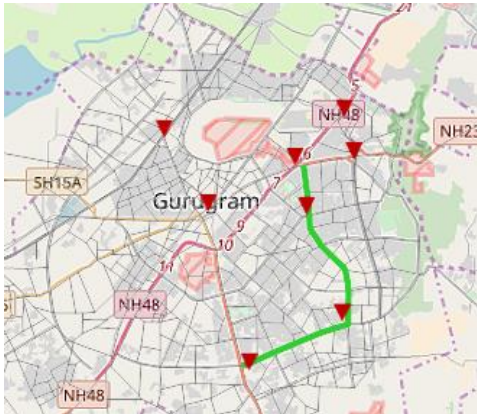
Route wise details

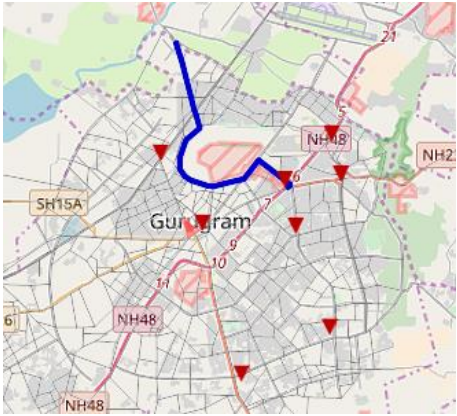

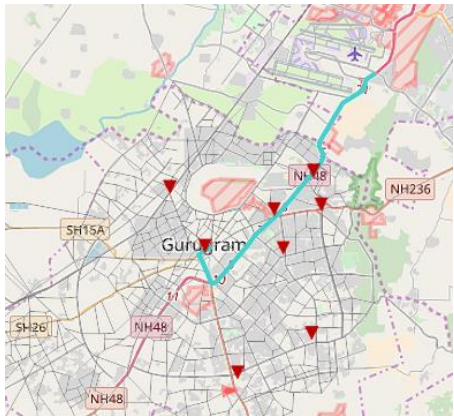
Route Map	Route Description
Trunk Routes	
 <p>Gurugram Bus stand to Bilaspur Kalan</p>	<ul style="list-style-type: none"> This is a major radial route with a length of 30.0 Kms and It connects to IMT Manesar, Kherki Daula, Narshinghpur, sector 34, Hero moto crop and Bus stand This Route overlaps with sector 97 to Badshahpur and Sikanderpur to sector 75
	<ul style="list-style-type: none"> This route passes through old Gurugram expressway and has length of 11.9 Kms. This is a high demand corridor connecting the major residential and Bus terminal area such as, Housing board colony, Model Town, Bus stand, DLF Colony, Anamika Enclave, Sukhrali enclave, Maruti Suzuki, IDPL TWP and Dundhera



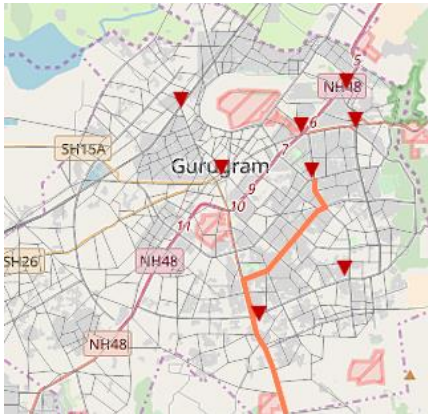
Harsaru to Dundahera	
 <p>Huda city center to Dharmapuri</p>	<ul style="list-style-type: none"> • The length of this route is 13.0 Kms • This route connects with Major nodes such as Railway station, bus stand and Huda city center • This route passes through major residential areas and office areas
 <p>Sector 2 to Ghata Village</p>	<ul style="list-style-type: none"> • The length of this route is 19.7 Kms, • This Route connects to major office areas and residential areas • This route passes through Colombia asia hospital, Electronic city, DLF Cyber city, DLF Phase 1, DLF Golf course, DLF Phase 5, Sector 55 and Ghata Village
 <p>Basai Chowk to Huda city center (Via GBS)</p>	<ul style="list-style-type: none"> • The length of the route is 11.90Kms • This route connects to the Basai enclave, Inox mall, Ayan Hospital, Bus stand, Sector 32, sector 32 and Huda city center

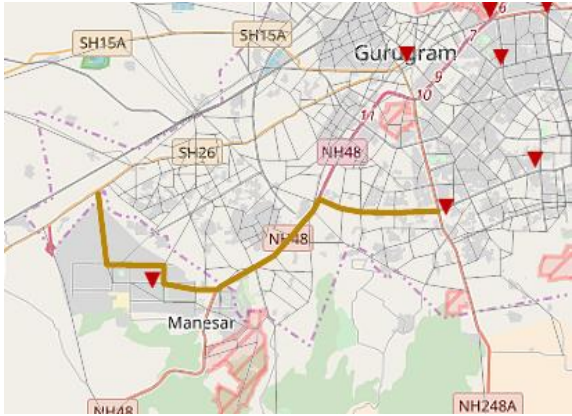

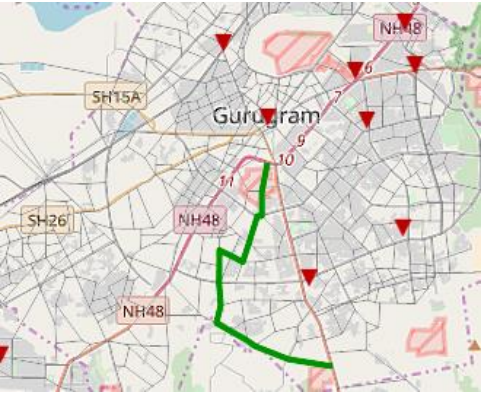
 <p>Gurugram Bus stand to Dhaulkaun</p>	<ul style="list-style-type: none"> • The length of the route is 17.4 Kms • This route passes through major demand areas such as Bus stand, Sector 32, sector 31, star mall, Leisure Valley Park, MGF mall, DLF Cyber city and airport
 <p>Sohna to Gurugram Railway station</p>	<ul style="list-style-type: none"> • The length of this route is 21.7 Kms. • This route connects between the Railway station and Sohna village • This route passes through major demand and activity areas such as Railway station, Bus stand, Medi city, Badshahpur and Sohna
 <p>IMT Manesar to Railway station</p>	<ul style="list-style-type: none"> • The length of this route is 26.0Kms • This route connect a linkage between IMT Manesar and railway station via bus stand
<p>Primary Routes</p>	

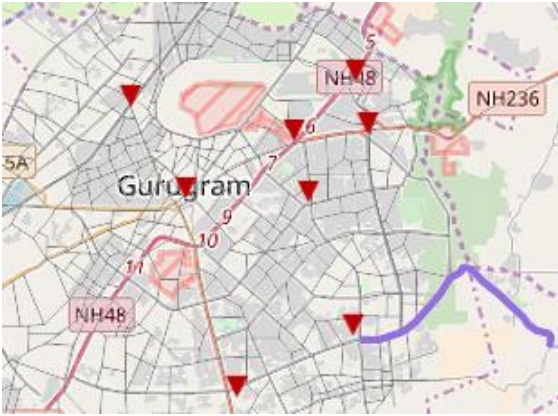

 <p>Gurugram Bus stand to Anand Vihar</p>	<ul style="list-style-type: none"> • The length of this route is 48.0 Kms • This route connects to Delhi and Gurugram central area • This route passes through major areas such as bus stand, IFFCO chowk, Sikanderpur, Sahara mala and Various major nodes in Delhi
 <p>Huda City center to Huda City center</p>	<ul style="list-style-type: none"> • The length of route is 25.1 Kms • This route act as mudrika sewa in Delhi, which is loop route • It starts at Huda city center and its passes through Honda chowk, Basai Chowk, Railway station, Palam Vihar, IFFCO chowk and ends at Huda city center
 <p>Gurugram Bus stand to Farrukh nagar</p>	<ul style="list-style-type: none"> • The length of this route is 19.4 Kms • It connects Farrukh nagar to the Bus Stand passing through the Basai Road. • This route caters to the demand of major residential areas of outer areas like Dhankot, Chandu, and Farrukh nagar.

 <p>Gurugram Bus stand to Ansal University</p>	<ul style="list-style-type: none"> • The length of the route is 13.9 Kms • The routes passes through the major residential areas with connecting to Gurugram Bus stand • This route connects to Ansal university, sun city, sector 56, Sector 56, 52, 45, Medicity and Bus stand
 <p>Sikanderpur to Sector 75</p>	<ul style="list-style-type: none"> • The length of the route is 16.2Kms • This route provide a connection between south to north of Gurugram • This route passes through major residential areas in Gurugram with connecting to Huda city center and Sikanderpur metro station
 <p>IFFCO Chowk to Badshahpur</p>	<ul style="list-style-type: none"> • The Length of route is 12.2 Kms • The route passes through IFFCO Chowk, Huda city center, sector 57 and Badshahpur

 <p>IFFCO Chowk to Palam Vihar</p>	<ul style="list-style-type: none"> • The length of the route is 12.6Kms • The route majorly covers IFFCO chowk, Prem Nagar, Rajiv nagar, Ashok Vihar, Palam Vihar and Sector 115
 <p>Sector 56 to Dhundahera</p>	<ul style="list-style-type: none"> • The length of the route is 16.3Kms • This route provides a access between West and east direction • This route passes through Dundhera, IFFCO chowk, Huda city center, Kedriya Vihar and sector 55 & 56
 <p>Gurugram Bus stand to Karolbagh</p>	<ul style="list-style-type: none"> • The length of route is 31.5Kms • This is an external radial route connecting Karol bagh with Bus Stand passing through old Delhi Gurugram Road. • This is a high demand corridor catering to the demand of various residential and commercial areas.

 <p>Gurugram Bus stand to Palam vihar</p>	<ul style="list-style-type: none"> • The length of the route is 10.5Kms • The route passes through Bus stand, Ashok Vihar and Palam Vihar
Secondary Routes	
 <p>Harsaru to Heli Mandi</p>	<ul style="list-style-type: none"> • The length of the route is 22.6Kms • This route connects to the Gurugram city to Heli Mandi Village • The route passes through the Heli Mandi, Pataudi, Sector 10A
 <p>Huda city center to Badshahpur</p>	<ul style="list-style-type: none"> • The length of the route is 13.2Kms • This route majorly passes through the residential areas by connecting Huda city center, Badshahpur and Maruti Kunj

 <p>Sector 97 to Badshahpur</p>	<ul style="list-style-type: none"> • The length of the route is 20.7Kms • This route provide connection between IMT Manesar to Badshahpur
 <p>Sector 2 to Sector 6A</p>	<ul style="list-style-type: none"> • The length of the route is 9.3Kms • This route passes through Pocket A, Pocket C and Udyog Vihar, Ambience mall
 <p>KIIT College of Engg. To Rajeev Chowk</p>	<ul style="list-style-type: none"> • The length of the route is 14.0Kms • This route passes through Sector 33, Behrampur, sector 70 and sector 38

 <p>Sector 61 to Greenfield</p>	<ul style="list-style-type: none"> The length of the route is 27.2Kms This route provide connection between Faridabad and Gurugram
 <p>Sector 88A to Palam Vihar</p>	<ul style="list-style-type: none"> The length of the route is 15.1kms This route provide connection between Dwarka, Palam Vihar and Gurugram

5.10 Proposed IPT Routes– Recommendation

Apart from bus routes, feeder routes on which IPT (6 seater smaller vehicles) can operate are also identified in the study and presented below. Metro rail feeder routes are not yet included in study and will be presented in subsequent reports.

Table 5-3 : Proposed IPT Routes

Sr. No	IPT/ Feeder Route Name	Length (in Km)
1	Sec 51 to Sec 43	5.9
2	Sec 94 to sec 78	5.7
3	Sec 36 to Mahaveer	5.6
4	Sec 16 to Sec 2	5.5
5	Sec 10 to sec 38	4.8
6	Mayfield to Sec 39	4.4
7	Sect 104 to Phase 1	3.6
8	Sector 105 to sector 2	3.19
9	Sector 37D to Sector 98	4.14
10	Kamahi Colony to Delhi Haryana border	4.2
11	Maruti Kunj to sector 25	2.46

The combined bus and IPT route map as proposed in the study is given below

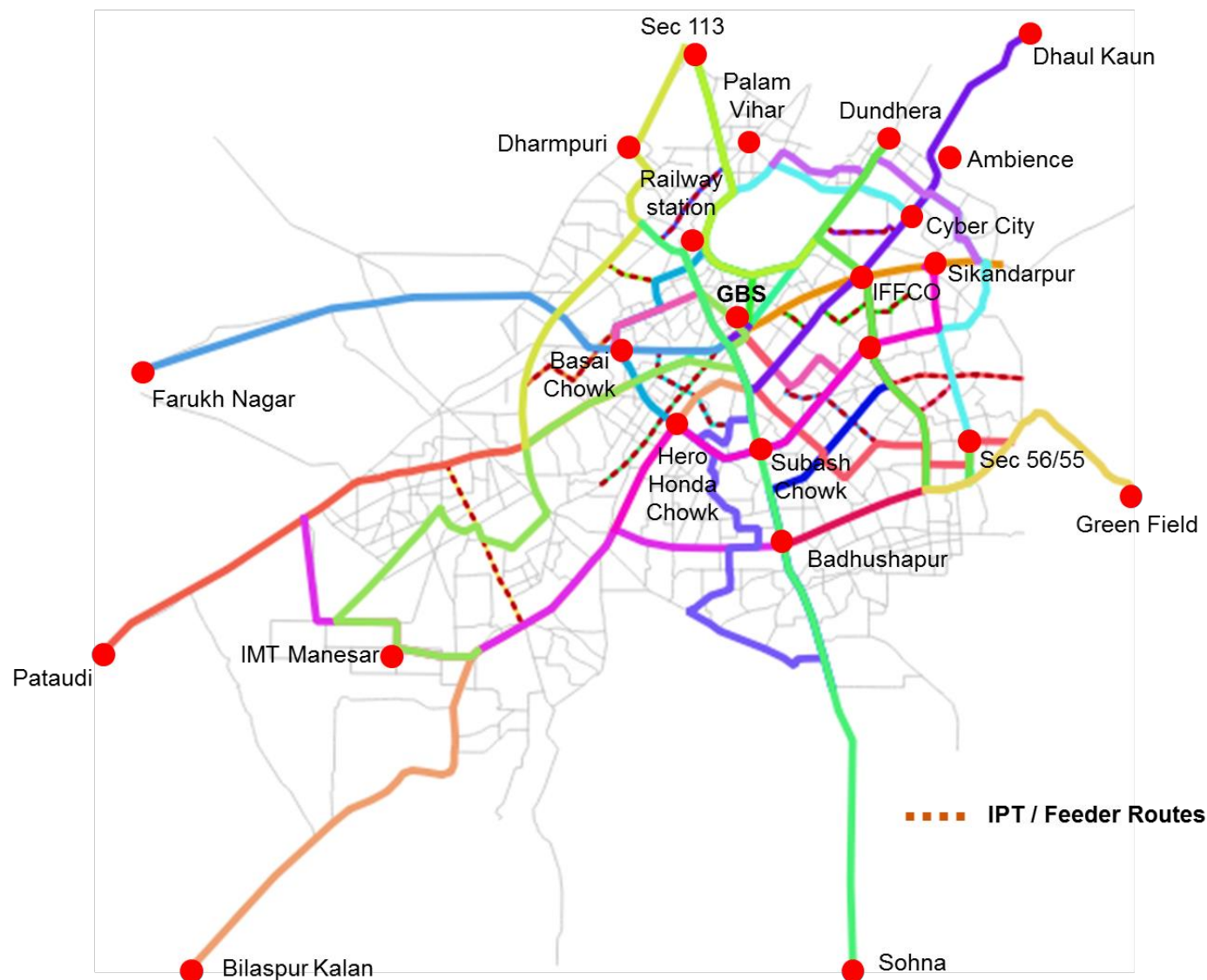


Figure 5-4 : Proposed Routes for Gurugram

5.11 Service & Operation Planning – Recommendation

5.11.1 Proposed Frequency

Once routes are identified next task is to identify frequency levels. Looking into route hierarchy, demand levels and passenger wait times, following frequencies are proposed for various route categories.

Table 5-4: Proposed Frequency of Various Route Categories

Category	Proposed Frequency in Minutes
Trunk Routes	5 Min
Primary Routes	8 Min
Secondary Routes	10 Min

Regional Routes frequency considered as 10Mins

5.11.2 Fleet Assessment - 2017

Once route frequencies are finalised, next task was to assess, fleet requirement for implementing proposed service plan. Following assumptions are used for assessment of fleet for study.

- Average Speed – 18 km per hour
- Frequency – average as proposed for category
- Layover time -10 Min

Formula as used for estimation of fleet is as under = Cycle Time/Frequency

$$\text{Cycle Time (Min)} = (2 * \text{Length} * 60) / \text{Speed}$$

Based on above analysis, estimated fleet is given below. It may be noted that total 430 buses will be required to maintain the frequency as proposed in the study. In addition, 10 % fleet will also be needed for maintenance/reserve purpose making total fleet estimate to 473 buses.

Table 5-5 : Category wise estimated fleet size (2017)

Sr. no	Route Type	Route Name	Route length (in km)	Fleet
1	Trunk	Gurugram Bus stand to Bilaspur kalan	30	22
2		Harsaru to Dundahera	11.9	18
3		Huda city center to Dharampuri	13	20
4		Sector 2 to Ghata Village	19.7	29
5		Basai Chowk to Huda city center (Via GBS)	11.9	18
6		Sohna to Railway station	21.7	16
7		Manesar to Railway station	26	19
		Total Trunk	134.2	142
1	Primary	Huda city center to Huda city center (via Hero Honda chowk, Railway station)	25.1	23
2		Gurugram Bus stand to Farrukh nagar	19.5	14
3		Gurugram Bus stand to Ansal University (Mayfield Garden)	13.9	13
4		Sikanderpur Metro station to Sector 75A	16.2	15
5		IFFCO Chowk to Badshahpur	12.2	12
6		IFFCO Chowk to Palam Vihar	12.6	12
7		Sec 56 to Dundahera	16.3	15
8		Gurugram Bus stand to Palam Vihar	10.5	10
		Total Primary	126.3	114
1	Secondary Routes	Huda City Center to Maruti Kunj (Via Badshahpur)	13.2	10
2		Sector 97 to Badshahpur (Via IMT Manesar)	20.7	15

Sr. no	Route Type	Route Name	Route length (in km)	Fleet
3		Sec 2 to Sec 6A	9.3	8
4		KIIT College of Engg to Rajeev Chowk	14	11
5		Sector 88A to Palam Vihar	15.1	12
		Total Secondary	72.3	56
1	Regional Routes	Gurugram Bus stand to Anand vihar	48	33
2		Gurugram Bus stand to Karol Bagh	31.5	22
3		Gurugram Bus stand to Heli Mandi	22.6	17
4		Sec 61 to Green Filed	27.2	20
5		Gurugram Bus stand to Dhaul kaun	17.4	26
		Total Regional	146.7	118
Grand Total			479	430
Additional 10% for maintenance (90% of fleet utilization)				43
Fleet estimated for Gurugram city bus services				473

It may be noted that above fleet is assessed for present demand levels without applying any demand management or mode shift strategy which could be planned in subsequent stages

5.12 Major Demand Points and Transfer Points

Based on public transport modelling conducted by the consultants, major demand generation points and transfer points are also identified. This will help us to determining requirement of adequate transport infrastructure (interchange terminals) for providing efficient bus service in Gurugram. These are shown in Figure below

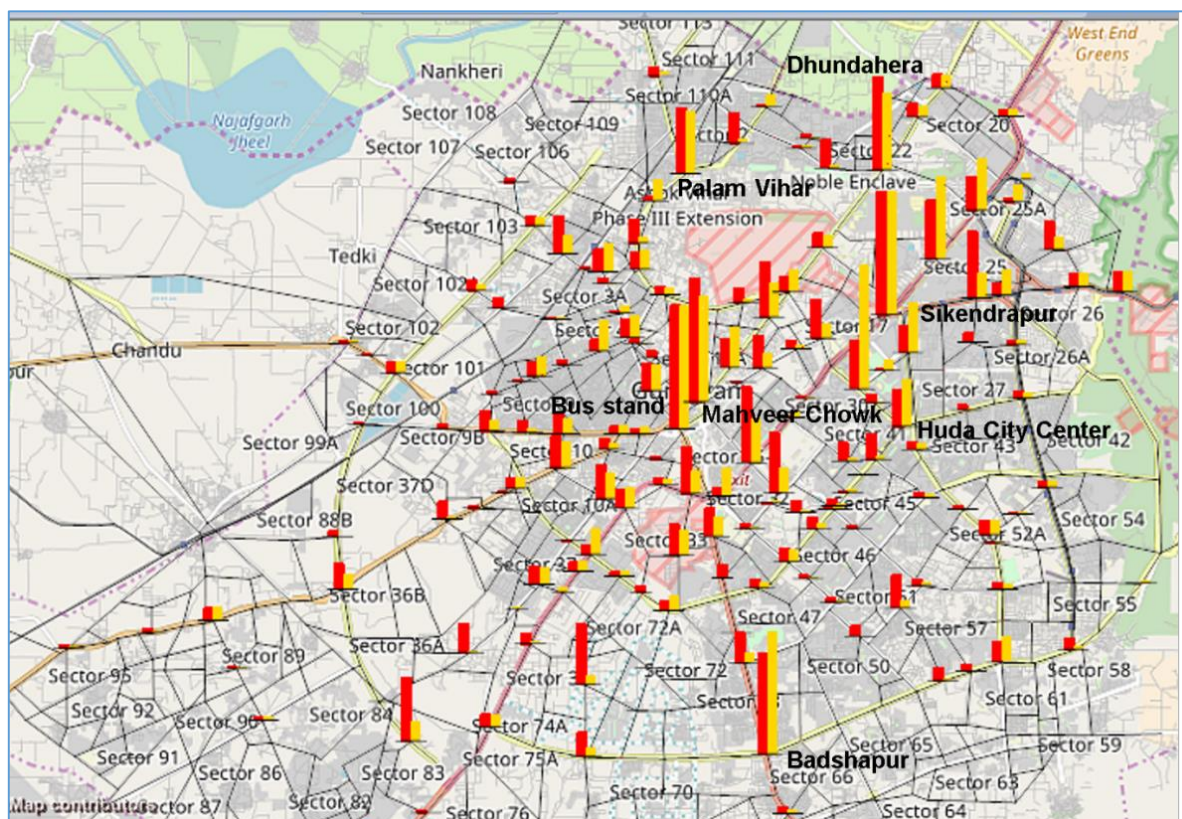


Figure 5-5 : Major Passenger Demand Points



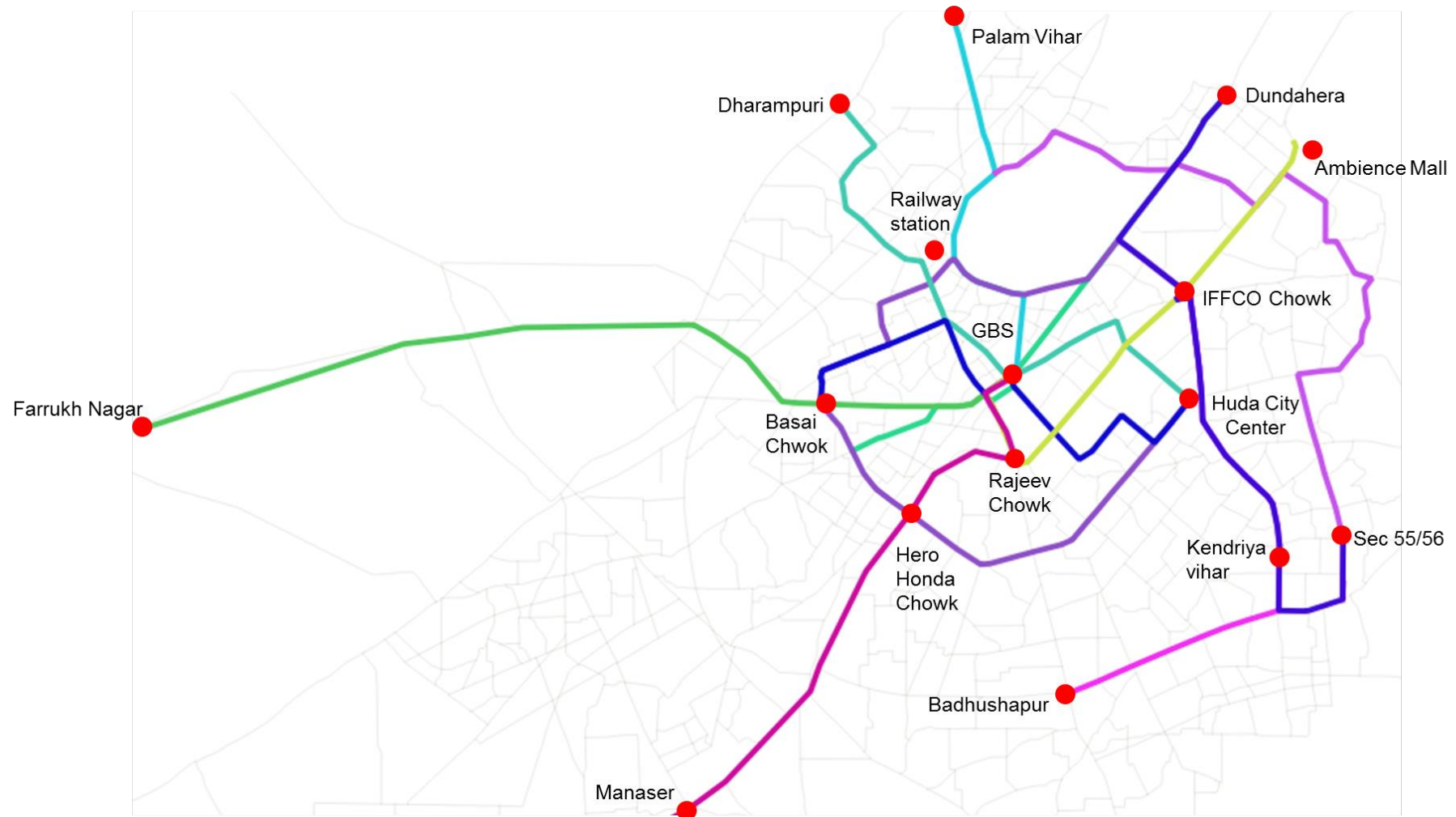
The recommended 25 routes will be implemented in a phase wise manner, based on the prioritization of routes. Route will be prioritized based on the spatial coverage of routes over the city and ridership range of the routes. For the first Phase around 200 buses will be required to implement with a composition of 20% AC & 80% of Non- AC Buses. The below map and table shows the list of routes under phase 1A.

Sr.no	Route Type	Type of Bus	Route Name	Route length (in km)	Phase - 1	
					Frequency (in mins)	Fleet
1	Phase 1 A	Non - AC	Gurugram Bus stand to Manesar	12	5	18
2			Harsaru to Dundaheara	11.9	5	18
3			Huda city center to Dharampuri	13	5	20
4			Sector 2 to Ghata Village	19.7	5	29
5			Basai Chowk to Huda city center	12.0	5	18
6			Huda city center to Huda city center (via Hero honda chowk, Railway station)	25.1	8	23
7			Gurugram Bus stand to Farrukh nagar	19.5	10	14
8			Gurugram Bus stand to Palam Vihar	10.5	8	10
Non -AC Buses Required						148
Additional 10% for maintenance (90% of fleet utilization)						15
Total Non- AC Buses Required						165
9	Phase 1 A	AC	IFFCO Chowk to Badshahpur	12.2	8	12
10			Gurugram Bus stand to Ambience mall	12.2	10	10
11			Sec 56 to Dundhera	16.3	8	15
AC Buses Required						37
Additional 10% for maintenance (90% of fleet utilization)						4
Total AC Buses Required						41
Total Buses Required				187		
Additional 10% for maintenance (90% of fleet utilization)				19		
Grand total Buses required				206		

It may be noted that, by restructuring bus route network, route overlaps will reduce significantly and coverage of public transport will improve significantly.

Table 5-7: Ridership/ per day details of Phase 1 Routes

Sr.no	Name	Ridership (Per day)	Frequency in Mins	Fleet size
1	Harsaru to Dundahera	17964	5	18
2	Huda city center to Dharampuri	18115	5	20
3	Sector 2 to Ghata Village	26605	5	29
4	Basai Chowk to Huda CC	17908	5	18
5	Huda city center loop	11594	8	23
6	GBS to Farrukh Nagar	11845	10	14
7	Sec 56 to Dundahera	11424	8	15
8	Palam Vihar to Gurugram Bus stand	7068	8	10
9	IFFCO Chowk to Badshahpur	7425	8	12
10	Gurugram Bus Stand to Ambience Mall	7950	10	10
11	Gurugram Bus stand to IMT Manaser	9997	5	18
Total		147895		187
10% additional Buses				19
Total Fleet size Required				206

**Figure 5-7 : Phase – I Routes**

CHAPTER 6

Recommended Routes for Future – 2037

6 Recommended Routes for Future – 2037

6.1 Background

For future bus route planning and development of an efficient and reliable bus network system for Gurugram, it would require operation strategy of ramping up fleet by considering the base year recommended routing patterns, alignments and operations apart from adding new services for unconnected areas. As part of this process, hierarchical bus route network has been proposed for city based on various requirements derived from the study.

This chapter briefly explains about the methodology adopted for future bus route planning based on the future growth direction, forecasted travel demand and travel patterns

6.2 Future Growth direction of the study area

Urban growth is an inevitable phenomenon as the urban population and the urban centres are continuously on the increase. Gurugram has experienced growth in terms of spatially, economically and demographically. With this sharp spurt in its growth, it seems to have taken a modern avatar or reincarnation. It stands today grown and developed from a small town to being the Millennium City of the country. The development phase of Gurugram is discussed below.

6.2.1 Contemporary Phase of Gurugram

In 1966 when the state of Haryana was formulated, Gurugram was designated as one of its districts. Initially, most of the area was agricultural in nature being an agro-based economy. The planned urban development of Gurugram started in 1966 with the interception of the town under the Urban Estates Department, Haryana. And 1970s mark the beginning of the city's growth and development journey. But it has been since 1990s onwards that the huge population has moved into the city and giving it a growth spurt.

Gurugram has become home to numerous job options by the end of the 1990s with GE being the first to set up its outsourcing unit in Corporate Park in Gurugram in 1997. This has led to the huge population growth contributing to the making of the Millennium City. Based on the differential growth experience of the Gurugram (that has been there pre-1990s and post 1990s). The figure & table given below shows the growth of the city through the two phases:

Table 6-1 : Phase wise Growth of Gurugram

Time line	Sectors that came up
1970s (particularly later half that is 1975-1978)	Acquisition of land Near Dundahera, Mulahera for Maruti
1975 to 1982	Udyog Vihar Ph.-I Industrial Area
1982 to 1990	Sectors 31 to 38 (Sector 31, 32, 38-1987; Sector 32A-1989)
1990 to 1995	Sectors – 26, 26A, 27, 39, 39, 40 and 41
1990	A, E, G and K blocks, Silver Oaks of DLF & Ansals Only
1995 to 2000	Sector 24, 25, 25A, 28, 29, 42 to 49
Since 2000	Sector 50 to 5

Source: he Growth Journey of Gurugram to the millennium city

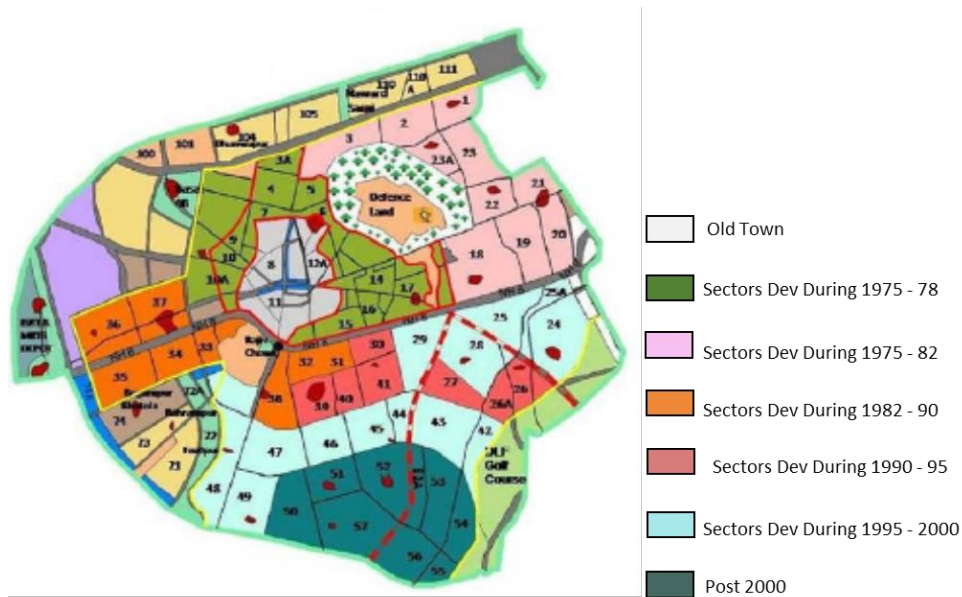


Figure 6-1: Phase wise growth of Gurugram

6.2.2 Spatial growth direction of the city

Consultants has been tried to understand the spatial growth direction of the city, which helps in predict the future expansion of the city and to provide the public transport supply services in those areas to better connection between the newly developing areas and developed areas. It also helps in reduce the dependency on personal vehicles in the very initial development of the areas.

The below figures shows the spatial growth and direction of Gurugram in three phases 2005, 2011 and 2017

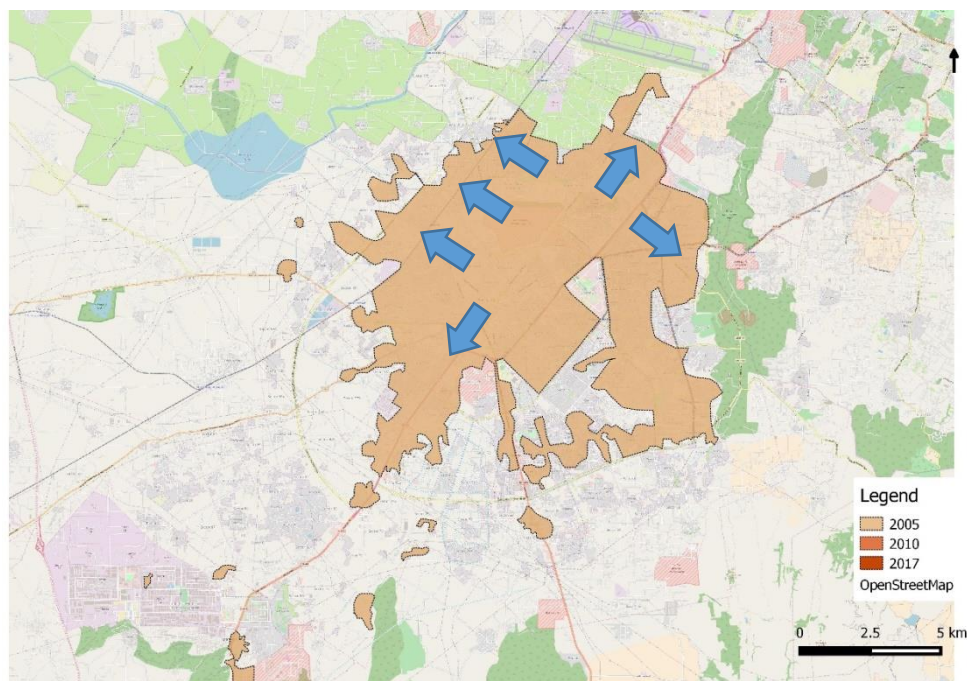


Figure 6-2 : Spatial growth of the city - 2005

Up to 2005, most of the city spatial growth direction is west and east side of the study area with sectors development

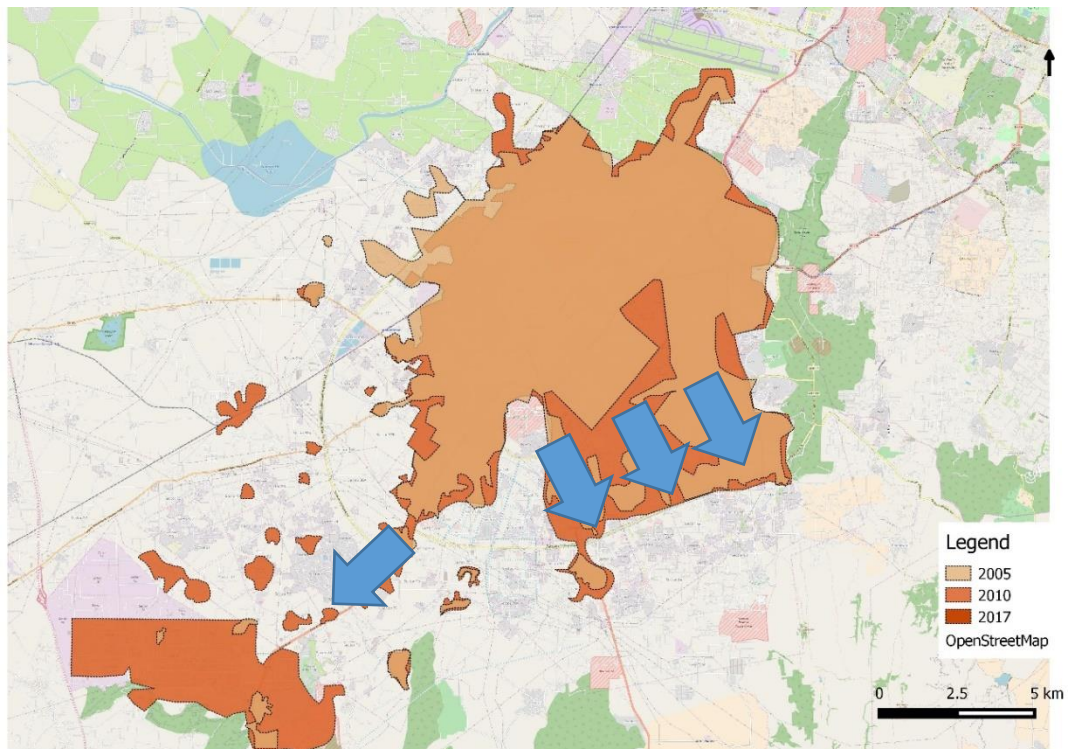


Figure 6-3: Spatial growth of the city - 2010

Between 2010–2005 year, the spatial growth direction of the city towards south and east direction of the city, where most of the development is sector development.

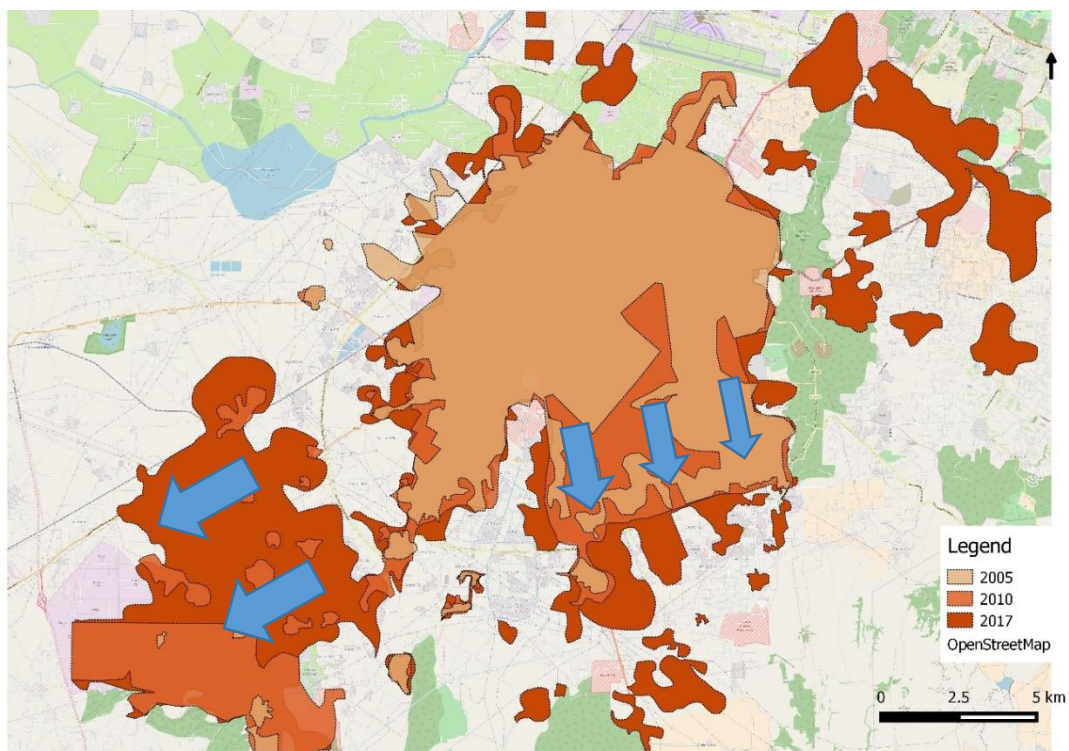


Figure 6-4 : Spatial Growth of the city – 2017

Till today (2017), growth direction still maintains towards east of the city (Badshahpur & Sohna direction) and growth also extended towards south side (Manesar).

6.3 Future Growth of Gurugram – Master plan

The Development Plan for Gurugram-Manesar Urban Complex was prepared in 2010 for year 2031, As per notified Development Plan of GMUC, areas of Gurugram-Manesar Urban Complex which have so far been developed in public and private sector including existing town and village would accommodate 22 lacs population. In order to cater to the future demand of Gurugram-Manesar Urban Complex an additional area of 22957 hectares has been added in the form of urbanisable area for the said complex to accommodate 20.50 lacs additional population. Thus, the total urbanisable area of Gurugram- Manesar Urban Complex would accommodate 42.50 lacs population by 2031 AD.

Proposed land uses: - The extent of various land uses as proposed in the Development Plan are given as below: -

Table 6-2 : Proposed Land use break - Master Plan - 2031

Sr. No.	Land use	Area (in Hectares)
1	Residential	16021
2	Commercial	1616
3	Industrial	4613
4	Transport and Communication	4428
5	Public Utilities	608
6	Public and semi public	2027
7	Open spaces	2928
8	Special zone	114
9	Defence land	633
Total land		32988
10	Existing town	406
11	Village abadies	478
Grand Total		33872

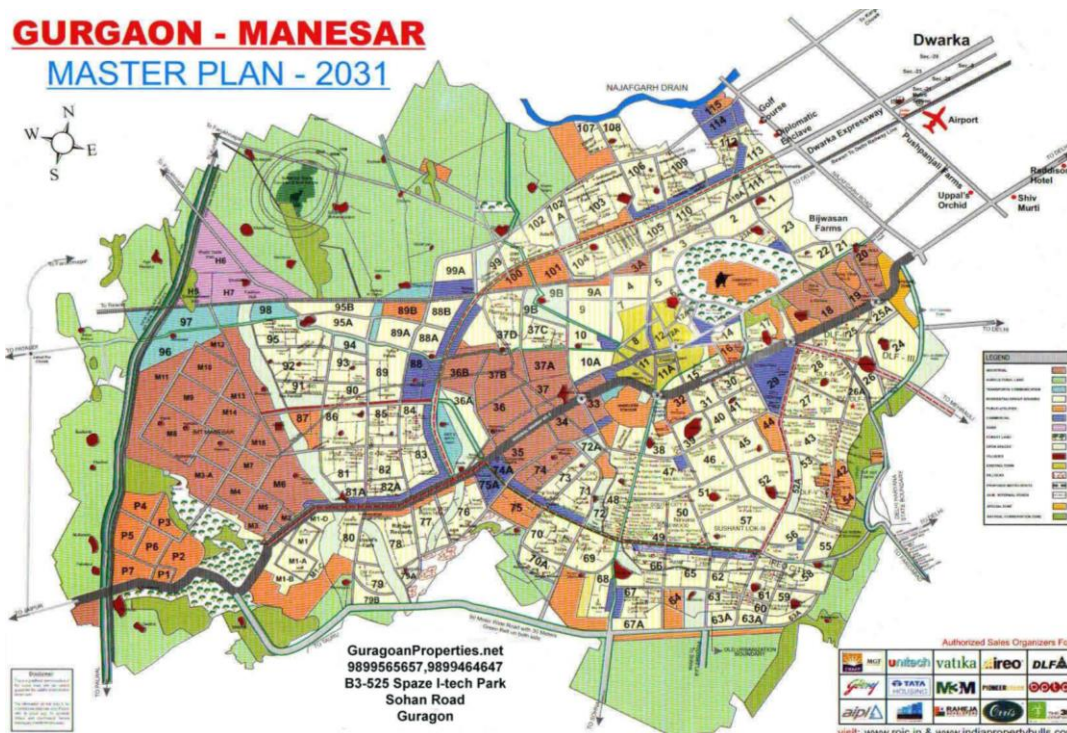


Figure 6-5 : Gurugram Master Plan Map - 2031

6.4 Forecast of Planning Parameters

The population of Gurugram had risen fast from 18,613 people in 1951 to 37,868 in 1961. This increase was mainly due to the growth of industry in and around Gurugram and its nearness to Delhi. Its importance was also due to the district administrative offices having been located here.

From 1971 to 2001, it has crossed 1 lakh (1.7 lakh) mark adding slightly more than 1 lakh population over a period of 30 years and a much higher number that is 15,00,000 (1.5 million) in the last decade from 2001 to 2011. The steep growth of population during 2001 and 2011 that is the preceding decade indicates large scale in-migration of people from neighbouring states in particular. This has been largely due to the work opportunities generated forming a series of them. The initial opportunities were that of the Maruti plant in 1980s and followed by ancillary plants coming up. In the end of 1990s and beginning of 2000, there was a large number of call centres, BPOs, KPOs – all working in shifts with a lot of cabs, thus not only generating in-office jobs but also jobs for drivers, guards,. It was followed by IT companies and other corporate office jobs coming up causing large number of families moving into the city simultaneously with the coming in of the low income generating jobs.

The table below shows the census year wise population details and their growth rates

Table 6-3 : Population Details (1991 - 2017)

Year	Population
1991	128253
2001	211079
2011	876969
2017	1161530
CAGR (2017 - 91)	8.84%
CAGR (2017-2001)	11.25%

Year	Population
CAGR (2017-2011)	4.80%

GMDA population for the year 2017 is around 13.36 lakh population

6.4.1 Population forecast – 2037

Population forecast has been done based on various available methods and average has been considered for this study. Design of public transport is based on the estimated/ projected population of the study area. Any underestimate value will make system inadequate for the purpose intended; similarly overestimated value will make it costly. For this study, horizon year is considered as 2037. The table below shows the projected population from various methods for GMDA & MCG Area.

Table 6-4 : Population Forecast for MCG - 2037

Year	Arithmetic	Geometric	Incremental	Graphical	Average
1991	128253	128253	128253	128253	128253
2001	211079	211079	211079	211079	211079
2011	876969	876969	876969	876969	876969
2017	1161530	1161530	1161530	1161530	1161530
2022	1310144	1336760	1284553	1312635	1311023
2027	1458759	1538426	1440870	1523863	1490479
2032	1607373	1770515	1630481	1735092	1685865
2037	1749687	2037618	1854627	1934825	1894604

Table 6-5 : Population forecasted for GMDA - 2037
Population Projections - GMDA

Year	Arithmetic	Geometric	Incremental	Graphical	Average
1991	147518	147518	147518	147518	147518
2001	242785	242785	242785	242785	242785
2011	1008696	1008696	1008696	1008696	1008696
2017	1336000	1336000	1336000	1336000	1336000
2022	1506937	1537551	1477502	1509802	1507948
2027	1677875	1769508	1657299	1752758	1714359
2032	1848812	2036459	1875391	1995715	1939094
2037	2012503	2343683	2133206	2225449	2179187

6.5 Travel demand forecast

Travel demand of the study area has been forecasted for the year 2037 as a horizon year with assuming that, trip rates will remain same in the horizon year. The table below shows the trip details of the horizon year

Table 6-6 : Trip details - 2037

Parameters	Details
Population - 2037	2179187
PCTR Including walk (Base year)	1.83
PCTR excluding walk (Base year)	1.34

Parameters	Details
Total Trips (incl walk) - 2037	3987912
Total Trips (excl walk) - 2037	2920111

6.5.1 Mode split

Assuming that, introduction of bus route to the unconnected areas will help in improve the public transport scenario and share in the city by shifting from various modes. It is assumed that the walk percentage trips will remain same in the horizon year and it can be possible by encouraging and providing facilities for walk all over the city. The users which will shift to the public transport are IPT, two-wheeler and car and based on the past experience of the consultants and assumption future modal split for the study are has been derived and shown in the below table.

Table 6-7 : Estimated Horizon year Modal split

Mode	Total Trips	% Share (Incl Walk)	% Share (Excl Walk)
Two Wheeler	731747	18.35%	25.00%
Car	314037	7.87%	10.73%
Taxi	29150	0.73%	1.00%
Auto + Share Auto	413776	10.38%	14.14%
Bus	1180598	29.60%	40.33%
School Auto	400	0.01%	0.01%
School Rickshaw	1201	0.03%	0.04%
Van	49964	1.25%	1.71%
Metro	25919	0.65%	0.89%
Train	4543	0.11%	0.16%
Cycle Rickshaw	6396	0.16%	0.22%
E-Rickshaw	15307	0.38%	0.52%
Cycle	154112	3.86%	5.26%
Walk	1060763	26.60%	
Total	3987912	100.00%	100.00%

Assumption: except public transport there will no improvements in the present other available modes

6.6 Proposed Bus Routes - 2037

Horizon year route planning has been done based on the spatial growth direction, demographics and travel demand of the city. Routes were identified based on the connectivity of the villages with the main nodes/ towns and to the city center. Future upcoming sectoral developments to the major activity center to provide better connection to all over the city. The recommended ring radial network of the public transport will have an additional hub and spoke pattern in the horizon year by connecting the villages to the major node/ activity center (Hub is activity center and spoke as villages) with trunk and feeder system (trunk is hub to city center). The table below shows the route wise details of horizon year.

Sr.no	Route Type	Route Name	Route length (in km)
Base year recommended routes			
1	Trunk	Gurugram Bus stand to Bilaspur kalan	30
2		Harsaru to Dundahera	11.9
3		Huda city center to Dharampuri	13

Sr.no	Route Type	Route Name	Route length (in km)
4		Sector 2 to Ghata Village	19.7
5		Basai Chowk to Huda city center (Via GBS)	11.9
6		Sohna to Railway station	21.7
7		Manesar to Railway station	26
		Total Trunk	134.2
1	Primary Routes	Huda city center to Huda city center (via Hero Honda chowk, Railway station)	25.1
2		Gurugram Bus stand to Farrukh nagar	19.5
3		Gurugram Bus stand to Ansal University (Mayfield Garden)	13.9
4		Sikanderpur Metro station to Sector 75A	16.2
5		IFFCO Chowk to Badshahpur	12.2
6		IFFCO Chowk to Palam Vihar	12.6
7		Sec 56 to Dundhera	16.3
8		Gurugram Bus stand to Palam Vihar	10.5
		Total Primary	126.3
1	Secondary Routes	Huda City Center to Maruti Kunj (Via Badshahpur)	13.2
2		Sector 97 to Badshahpur (Via IMT Manesar)	20.7
3		Sec 2 to Sec 6A	9.3
4		KIIT College of Engg to Rajeev Chowk	14
5		Sector 88A to Palam Vihar	15.1
		Total Secondary	72.3
1	Regional Routes(Connecting outside Gurugram Metropolitan Area)	Gurugram Bus stand to Anand vihar	48
2		Gurugram Bus stand to Karol Bagh	31.5
3		Gurugram Bus stand to Heli Mandi	22.6
4		Sec 61 to Green Filed	27.2
5		Gurugram Bus stand to Dhaul kaun	17.4
		Total Regional	146.7
Proposed routes for Horizon year			
1	Routes connecting to Future developments	Honda chowk to IFFCO chowk (via Police station)	23.2
2		NBRC Gate (Nainwal Mode) to Sector 55/56	23.8
3		Outer Loop	49.7
4		Sohna to Kheri lala	12.9
5		Railway station to sector 58	18.9
6		Farrukh Nagar to Manesar	24.4
7		Basai Chowk to Kapashera Border	15.2
8		Bilaspur Kalan to Sohna	27
9		Sohna to sector 60	21.8
10		Tauru to New sector road	19.9
11		Dwarka sector 21 to Gurugram Bus stand	13.5
12		Dwarka sector 21 to Cyber city	11
13		Railway station to Park Dr	14.9
14		Huda city center to Kholi wale Baba ka mandir	10

Apart from bus routes, feeder routes on which IPT (6 seater smaller vehicles) can operate are also identified in the study and presented below

Table 6-8 : Proposed IPT routes for 2037

Type	Sr. No	IPT/ Feeder Route Name	Length (in Km)
Base year Recommended IPT Routes	1	Sec 51 to Sec 43	5.9
	2	Sec 94 to sec 78	5.7
	3	Sec 36 to Mahveer	5.6
	4	Sec 16 to Sec 2	5.5
	5	Sec 10 to sec 38	4.8
	6	Mayfield to Sec 39	4.4
	7	Sect 104 to Phase 1	3.6
	8	Sector 105 to sector 2	3.19
	9	Sector 37D to Sector 98	4.14
	10	Kanhai Colony to Delhi Haryana border	4.2
	11	Maruti Kunj to sector 25	2.46
Proposed IPT routes for Horizon year	1	Farrukh Nagar to Taj Nagar	6.92
	2	Farrukh Nagar to Kaliawas	3.54
	3	Chandu to National cancer Institute	5.80
	4	Chandu to Garhi Harsaru	4.46
	5	Garhi Harsaru railway station to Gopalpur	2.84
	6	Baba Bhumiya to Bhondsi	3.27
	7	Vatika Kunj to Shivam Park	4.32
	8	Bhondsi jail to KIIT college	3.22

6.7 Service & Operation Planning – Proposed Routes 2037

6.7.1 Proposed Frequency

Once routes are identified next task is to identify frequency levels. Looking into route hierarchy, demand levels and passenger wait times, following frequencies are proposed for various route categories.

Table 6-9: Proposed Frequency of Various Route Categories

Category	Proposed Frequency in Minutes
Trunk Routes	3 Min
Primary Routes	5 Min
Secondary Routes	8 Min
Proposed Routes	10 Min

recommended Regional Routes frequency considered as 5Mins

6.7.2 Fleet Assessment

Once route frequencies are finalised, next task was to assess, fleet requirement for implementing proposed service plan. Following assumptions are used for assessment of fleet for study.

- Average Speed – 18 km per hour
- Frequency – average as proposed for category
- Layover time -10 Min

Formula as used for estimation of fleet is as under = Cycle Time/Frequency

$$\text{Cycle Time (Min)} = (2 * \text{Length} * 60) / \text{Speed}$$

Based on above analysis, estimated fleet is given below. It may be noted that total 924 buses will be required to maintain the frequency as proposed in the study in horizon year. In addition,

10 % fleet will also be needed for maintenance/reserve purpose making total fleet estimate to 1016 buses.

Sr.n o	Type of Routes	Route Name	Route length (in Km)	Frequency (in mins)	Fleet
1	Trunk	Gurugram Bus stand to Bilaspur kalan	30	5	42
2		Harsaru to Dundhera	11.9	3	30
3		Huda city center to Dharampuri	13	3	33
4		Sector 2 to Ghata Village	19.7	5	29
5		Basai Chowk to Huda city center (Via GBS)	11.9	3	30
6		Sohna to Railway station	21.7	3	52
7		Manesar to Railway station	26	3	62
1	Primary Routes	Huda city center to Huda city center (via Hero Honda chowk, Railway station)	25.1	5	36
2		Gurugram Bus stand to Farrukh nagar	19.5	5	28
3		Gurugram Bus stand to Ansal University (Mayfield Garden)	13.9	5	21
4		Sikanderpur Metro station to Sector 75A	16.2	5	24
5		IFFCO Chowk to Badshahpur	12.2	5	19
6		IFFCO Chowk to Palam Vihar	12.6	5	19
7		Sec 56 to Dundhera	16.3	5	24
8		Gurugram Bus stand to Palam Vihar	10.5	5	16
1	Secondar y Routes	Huda City Center to Maruti Kunj (Via Badshahpur)	13.2	8	13
2		Sector 97 to Badshahpur (Via IMT Manesar)	20.7	8	19
3		Sec 2 to Sec 6A	9.3	8	9
4		KIIT College of Engg to Rajeev Chowk	14	8	13
5		Sector 88A to Palam Vihar	15.1	8	14
1	Regional Routes(C onnecting outside outside	Gurugram Bus stand to Anand vihar	48.0	5	66
2		Gurugram Bus stand to Karol Bagh	31.5	5	44
3		Gurugram Bus stand to Heli Mandi	22.6	8	21
4		Sec 61 to Green Filed	27.2	8	24
5	Gurugram Metropolit an Area)	Gurugram Bus stand to Dhaul kaun	17.4	5	33
Proposed routes for Horizon year					
1	Proposed Routes - 2037	Honda chowk to IFFCO chowk (via Police station)	23.2	10	17
2		NBRC Gate (Nainwal Mode) to Sector 55/56	23.8	10	17
3		Outer Loop	49.7	10	35
4		Sohna to Kheri lala	12.9	10	10
5		Railway station to sector 58	18.9	10	14
6		Farrukh Nagar to Manesar	24.4	10	18
7		Basai Chowk to Kapashera Border	15.2	10	12
8		Bilaspur Kalan to Sohna	27	10	19
9		Sohna to sector 60	21.8	10	16
10		Tauru to New sector road	19.9	10	15
11		Dwarka sector 21 to Gurugram Bus stand	13.5	10	10
12		Dwarka sector 21 to Cyber city	11	10	9
13		Railway station to Park Dr	14.9	10	11
14		Huda city center to Kholi wale Baba ka mandir	10	10	8

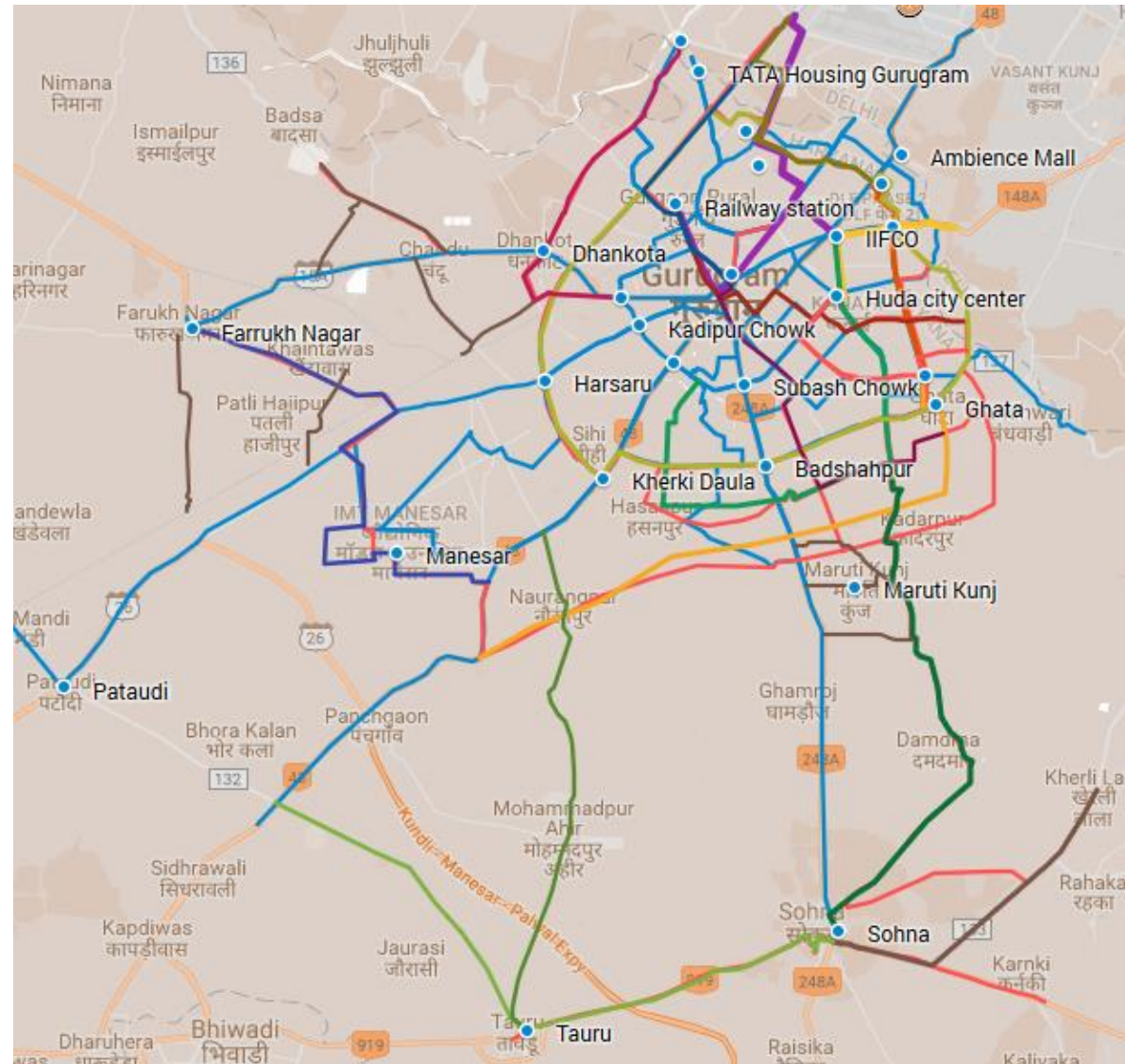


Figure 6-6: Proposed Bus routes for HY-2037

CHAPTER 7

Recommended Route wise bus stop details

7 Recommended Route Wise Bus Stop Details

7.1 Bus stop design principals and guidelines

Bus stops are broadly classified into three categories, which are mainly;

Category 1: Sign Only

Category 2: Sign & Bench

Category 3: Sign, Bench & Shelter

For each of these bus stop categories, there are three basic locations: far-side stops, near-side stops, and mid-block stops. Each location has its benefits and may either be a curb side stop or have a bus turnout, although turnouts are most commonly used at mid-block stops.

Far side bus stops are located downstream of signalized or un-signalized intersections. Far-side stops typically provide a gap in traffic, so the bus has a higher level of visibility and may pull out into traffic more safely.

- The pedestrian crosses the road behind the bus waiting at the stop, as normally pedestrians prefer to cross the road near the mouth of the intersection in order to access intersecting streets.
- Clear visibility for both the pedestrian and oncoming traffic (unhindered by the bus) of each other; and
- The reduced risk of a bus colliding with crossing pedestrians when leaving the bus stop.



Figure 7-1 : Placement of pedestrian crossing behind bus stops

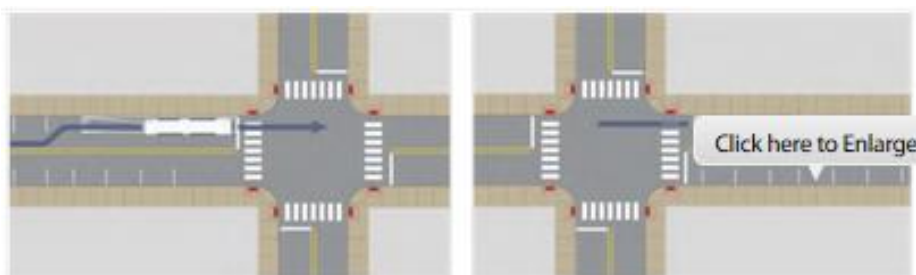


Figure 7-2 : Bus stops located on the far side (right) are desirable

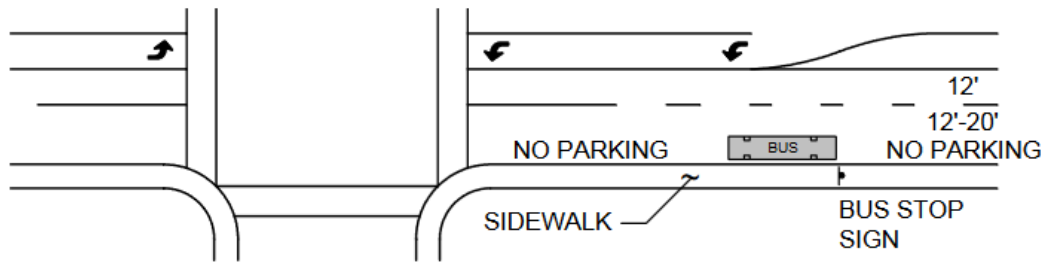


Figure 7-3 : Far side Bus stop

Near-side stops are located upstream of an intersection and may be used where the route changes direction at an intersection. Issues associated with using near-side stops include buses or passenger shelters that block sight lines near intersections; buses that block right turn lanes; and pedestrians/passengers that walk in front of the bus.

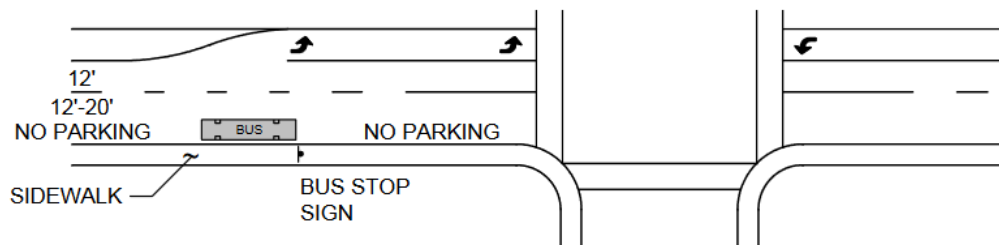


Figure 7-4 : Near side bus stop

Mid-block stops are located between intersections and typically serve a major destination such as a hospital or shopping center. Mid-block stops typically result in a loss of on-street parking, encourage jay-walking, require transitions so the bus may pull in and out of the stop, and can interfere with driveways and utilities.

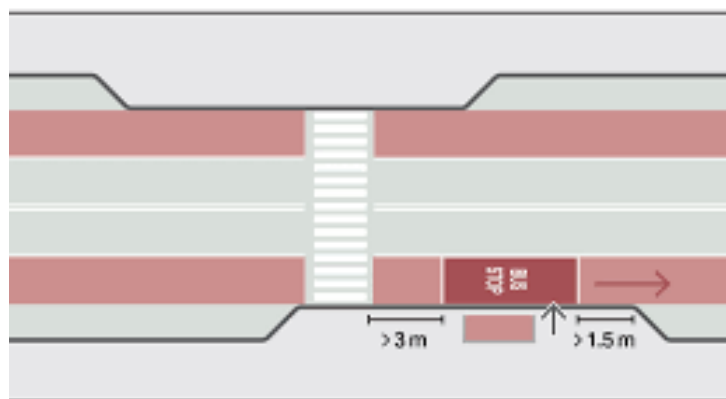


Figure 7-5 : Mid-block Stops

7.2 Advantages and disadvantages of bus stops

7.2.1 Far side bus stop

Advantages	Dis-advantages
<ul style="list-style-type: none"> Minimizes conflict between buses and right turning vehicles traveling in the same direction Minimizes sight distance problems on approaches to the intersection Encourages pedestrians to cross behind the bus Minimizes area needed for curbside bus zone If placed just beyond a signalized intersection in a bus turnout, buses may more easily re-enter the traffic stream If a turnout is provided, vehicle capacity through intersection is unaffected 	<ul style="list-style-type: none"> If bus stops in travel lane, could result in traffic queued into intersection behind the bus (turnout will allow traffic to pass around the stopped bus) If bus stops in travel lane, could result in rear-end accidents as motorists fail to anticipate stopped traffic May cause passengers to access buses further from crosswalk May interfere with right turn movement from cross street

7.2.2 Near side bus stop

Advantages	Dis-advantages
<ul style="list-style-type: none"> Minimizes interference when traffic is heavy on the far-side of an intersection Allows passengers to access buses close to crosswalk Driver may use the width of the intersection to pull away from the curb Allows passengers to board and alight when the bus is stopped for a red light Provides the driver with the opportunity to look for oncoming traffic, including other buses with potential passengers 	<ul style="list-style-type: none"> Stopped bus may interfere with a dedicated right turn lane May cause sight distance problem for cross-street traffic and pedestrians If located at a signalized intersection, and if the shoulder width at the stop is such that buses will exit the traffic stream, a traffic queue at a signal may make it difficult for buses to re-enter the traffic stream Prohibits through traffic movement with green light, similar to far-side stop without a bus turnout May cause pedestrians to cross in front of the bus at intersections

7.2.3 Mid-Block bus stop

Advantages	Dis-advantages
<ul style="list-style-type: none"> Minimizes sight distance problems for vehicles and pedestrians May result in passenger waiting areas experiencing less pedestrian congestion May be closer to passenger origins or destinations on long blocks May result in less interference with traffic flow 	<ul style="list-style-type: none"> Requires additional distance for no-parking restrictions Increases walking distance for patrons crossing at intersection, or requires special features to assist pedestrians with mid-block crossing May encourage jay-walking

7.3 General Guidelines for bus stop

- Ideal minimum dimensions of bus stop are – **10M X 1.5M X 2.2M ht.** If passenger demand is high, longer bus shelters would be necessary.
- Multiple bus shelters of recommended size should be constructed at busy location along mobility corridors.
- Design should be such that it does not obstruct visibility of surroundings and pedestrian flow on footpath.
- The design should be compact, robust with anti-skid, leveled floor space and with preferably cantilever roof, sufficient shade and light.
- Seating if provided should be compact and minimal.
- Guard rails / railings at the curb edge should not be provided.
- It should have provision for display of route info maps, digital sign boards apart from advertisement boards. Advertisements should not obstruct route information display maps, statutory signage etc. The displays and advertisement boards should be placed on bus stop such that they are perpendicular to pedestrian and vehicular movement and not at the backside of the stop, because then it creates an opaque space behind the bus stop, which pedestrians do not use.
- Night illumination is a must on bus stops.
- Bus stops should have emergency phone numbers/ police help line numbers displayed.
- Ideally a tree should be located near uni pole bus stop providing shade to the passengers.
- Bus stops should have proper provision of storm water drain to avoid water logging especially during monsoons.
- Water absorbing soil pits can be done at bus stops.
- Consideration should be given to gradient and raised curbs to drain off water at the bus stops.
- Bus stops should not take space away from footpaths, cycle tracks and carriage ways.
- They could be constructed in parking bays on bulb-outs which should be at the same level as the adjacent footpath or in MUZs.
- It should not obstruct pedestrian flow or cycle movement and avoid conflict with vehicular movement in any case.
- Bus stops to be in the vicinity of the junction but should be located at a distance of 50 m away from any junction.
- Parking should be prohibited in the zone 50m before bus stop and 20m after bus stop.
- Multiple bus stops to be provided at busy locations where route segregation is possible and where frequency of buses is high at peak hours.
- Bus stops should be accessed by zebra crossings, median breaks, refuge islands.
- Height of the flooring of the bus stop should not be more than 150 mm .
- Permanent lane marking should be one to distinguish bus waiting area near bus stop and ensure proper alignment of buses.
- Bollards/railings/reflective cats eyes to be provided to guide the bus to align properly with the bus stop.
- Bollards and railings will also prevent vehicle parking in the vicinity of bus stop.

- Road geometry mainly road width, footpath width, cycle track determine the location of bus stop. Location of parking bays should be determined After identifying a convenient location of bus stop

Source: Urban street design by ITDP



Figure 7-6 : Typical example of Bus stop

7.4 Route-wise Bus Stop Details for Phase 1A Routes

Consultant has carried out detailed inventory of proposed bus routes and identified bus stops based on major boarding alighting points/activity centres. In this chapter, bus stops for each route is presented

Route wise bus stop details are presented in the following tables

Bus Route : Gurugram Bus stand to IMT Manesar					
Bus type : Non AC					
Stop no	Route wise stop no	Bus Stop Name	Type	X	Y
207	23	GURUGRAM BUS STATION	proposed	77.033236	28.464847
388	23	GURUGRAM BUS STATION	proposed	77.033573	28.465276
205	22	CIVIL HOSPITAL	proposed	77.032584	28.461492
356	22	CIVIL HOSPITAL	proposed	77.032535	28.461186
407	21	GURUDWARA CHOWK/ AGGRAWAL DHARAMSALA CHOWK	proposed	77.031012	28.459235
408	21	GURUDWARA CHOWK/ AGGRAWAL DHARAMSALA CHOWK	proposed	77.030846	28.459429
202	20	SCERT OFFICE	proposed	77.029100	28.455245
386	20	COMMISSONER OF POLICE	proposed	77.029371	28.455181
204	19	SECRETARIET	proposed	77.031043	28.451712
385	19	HARYANA AGRICULTURE DEPT	proposed	77.030950	28.451228
146	18	NAHARPUR RUPA VILLAGE NH8	proposed	77.024100	28.448428
147	18	NAHARPUR RUPA VILLAGE NH8	proposed	77.023948	28.447920

144	17	KHANDSA MANDI	proposed	77.017710	28.444377
145	17	KHANDSA MANDI	proposed	77.016222	28.443424
142	16	SECTOR 33, TRANSPORT NAGAR	proposed	77.013842	28.440717
143	16	SECTOR 33, TRANSPORT NAGAR	proposed	77.014480	28.440584
141	15	HERO HONDA CHOWK	proposed	77.010703	28.437013
137	14	HITACHI	proposed	77.007776	28.433291
138	14	HITACHI	proposed	77.008090	28.432846
135	13	KHANDSA VILLAGE FOB	proposed	77.005184	28.429676
136	13	KHANDSA VILLAGE FOB	proposed	77.004121	28.429043
133	12	SOHNA	proposed	77.000597	28.424858
134	12	SOHNA	proposed	77.000556	28.424145
131	11	NARSINGHPUR FOB	proposed	76.995432	28.415836
132	11	NARSINGHPUR FOB	proposed	76.996536	28.416905
129	10	POST OFFICE NARSHINGHPUR	proposed	76.994339	28.412959
130	10	POST OFFICE NARSHINGAPUR	proposed	76.994086	28.413298
127	9	DLF CORPORATE GREENS	proposed	76.991190	28.407126
128	9	DLF CORPORATE GREENS	proposed	76.990957	28.407713
125	8	SHANI MANDIR	proposed	76.988891	28.403091
126	8	SHANI MANDIR	proposed	76.988648	28.403394
124	7	TOLL PLAZA STOP	proposed	76.983696	28.397728
123	6	TOLL PLAZA STOP	proposed	76.979990	28.393453
121	5	GREEN GURUGRAM	proposed	76.973772	28.387644
122	5	GREEN GURUGRAM	proposed	76.974198	28.387199
119	4	SIKOHHPUR MOR SEC 78	proposed	76.969033	28.382655
120	4	SIKOHHPUR MOR SEC 78	proposed	76.970248	28.384170
117	3	RAMPURA CHOWK	proposed	76.962006	28.379653
118	3	RAMPURA CHOWK	proposed	76.962239	28.379217
115	2	NAKHROLA VILLAGE	proposed	76.955335	28.375708
116	2	NAKHROLA VILLAGE	proposed	76.955011	28.376127
113	1	SHIV MANDIR	proposed	76.944378	28.370220
114	1	SHIV MANDIR	proposed	76.944338	28.370826

Note:

- 1 * It is proposed to repair these bus stop (or) construction of new structure for making them functional
- 2 ** Need to be removed/relocated; as these bus stops are placed near to the existing BQS and creating confusion
- 3 # Proposed Name for the existing bus stop which are not having any name at present.

Bus Route : Harsaru to Dundaheera					
Bus type : Non AC					
Stop no	Route wise stop no	Bus Stop Name	Type	X	Y
229	27	OLD GURGRAM ROAD, DUNDAHERA	proposed	77.079369	28.516872
228	26	DUNDAHERA	proposed	77.074118	28.511017
298	26	DUNDAHERA	proposed	77.074237	28.510753
297	25	CANDOR	proposed	77.072792	28.508556
244	25	CANDOR	proposed	77.073358	28.509777
226	24	SRI KRISHNA CHOWK	proposed	77.071134	28.506759
299	24	SRI KRISHNA CHOWK	proposed	77.071051	28.506258
225	23	JAWALA MILL CHOWK	proposed	77.068777	28.504004
295	23	JAWALA MILL CHOWK	proposed	77.068350	28.503343
296	22	HYATT PLACE	proposed	77.065900	28.500938
241	22	HYATT PLACE	proposed	77.065737	28.500351
240	21	MARUTI UDYOG GATE 1	proposed	77.062903	28.497353
300	20	MARUTI UDYOG GATE 2	proposed	77.060394	28.494519
301	20	MARUTI UDYOG GATE 2	proposed	77.060925	28.494734
224	19	SARHANAL MOR	proposed	77.058507	28.492441
317	19	SARHANAL MOR	proposed	77.058861	28.492520

222	18	PASCO CHOWK	proposed	77.055822	28.489261
318	18	PASCO CHOWK	proposed	77.056336	28.489497
219	17	SUKHRALI ENCLAVE	proposed	77.049928	28.482011
249	17	SUKHRALI ENCLAVE	proposed	77.050161	28.482724
247	16	PAYAL CIMEMA	proposed	77.048031	28.480075
218	15	HUDA OFFICE	proposed	77.045251	28.477149
216	14	RAJEEV NAGAR	proposed	77.043473	28.475137
263	13	KENDRIYA VIDYALAYA	proposed	77.039813	28.470945
211	12	SECTOR 12 MORE	proposed	77.037564	28.468414
387	12	BANL EXCHANGE	proposed	77.036874	28.469211
207	11	GURUGRAM BUS STAND	proposed	77.033236	28.464847
388	11	GURUGRAM BUS STATION	proposed	77.033573	28.465276
205	10	CIVIL HOSPITAL	proposed	77.032584	28.461492
356	10	CIVIL HOSPITAL	proposed	77.032535	28.461186
407	9	GURUDWARA CHOWK/ AGGRAWAL DHARAMSALA CHOWK	proposed	77.031012	28.459235
408	9	GURUDWARA CHOWK/ AGGRAWAL DHARAMSALA CHOWK	proposed	77.030846	28.459429
409	8	JAIN LAND COMPLEX SOHNA CHOWK	proposed	77.027068	28.458424
410	8	JAIN LAND COMPLEX SOHNA CHOWK	proposed	77.027132	28.458615
373	7	BHUTESWAR CHOWK, SHIVAJI NAGAR	proposed	77.023249	28.457180
197	7	BHUTESWAR CHOWK, SHIVAJI NAGAR	proposed	77.023326	28.457341
374	6	SARAH HOSPITAL	proposed	77.019189	28.456984
262	6	SARAH HOSPITAL	proposed	77.019287	28.456841
375	5	PATAUDI CHOWK	proposed	77.016855	28.456992
189	5	PATAUDI CHOWK	proposed	77.016819	28.456845
384	4	BHARATI NARSHING HOME	proposed	77.014090	28.454335
186	4	SHANTI PARK COLONY	proposed	77.013735	28.454231
383	3	SUKH DEV NAGAR	proposed	77.009351	28.452946
182	3	SHIV NAGAR	proposed	77.009974	28.452871
180	2	KADIPUR VILLAGE	proposed	77.004829	28.451198
382	2	ENGG MECH	proposed	77.005007	28.451041
175	1	KADIPUR CHOWK	proposed	76.998133	28.448793
381	1	PATAUDI	proposed	76.998298	28.448664

Note:

- | | | |
|---|----|---|
| 1 | * | It is proposed to repair these bus stop (or) construction of new structure for making them functional |
| 2 | ** | Need to be removed/relocated; as these bus stops are placed near to the existing BQS and creating confusion |
| 3 | # | Proposed Name for the existing bus stop which are not having any name at present. |

Bus Route : Huda city center to Dharmapuri					
Bus type : Non AC					
Stop no	Route wise stop no	Bus Stop Name	Type	X	Y
21	30	HUDA CITY BUS STOP	proposed	77.072604	28.458172
78	29	HUDA CITY BUS STOP *	Repair	77.070579	28.458753
79	29	HUDA CITY BUS STOP	existing	77.070498	28.459083
80	28	KR MANGALAM WORLD SCHOOL #	Proposed Name for existing stop	77.066382	28.461994
81	28	KR MANGALAM WORLD SCHOOL #	Proposed Name for existing stop	77.066797	28.461936
82	27	PLAZZIO HOSPITAL , SEC 29	existing	77.063607	28.464081
83	27	PLAZZIO HOSPITAL , SEC 29	existing	77.063542	28.464437

84	26	GYMKHANA CLUB #	Proposed Name for existing stop	77.061420	28.465790
85	26	GYMKHANA CLUB #	Proposed Name for existing stop	77.061299	28.466164
86	25	HOTEL CROWN PLAZA #	Proposed Name for existing stop	77.059218	28.467473
87	25	HOTEL CROWN PLAZA	existing	77.059491	28.467544
221	24	MANAGEMENT DEVELOPMENT INSTITUTION	proposed	77.056230	28.472642
393	24	MANAGEMENT DEVELOPMENT INSTITUTION	proposed	77.056306	28.472166
246	23	MAHARANA PRATAP CHOWK	proposed	77.052602	28.472133
392	23	SUBASH CHANDRA PARK	proposed	77.052094	28.472273
391	22	ITI STAFF COLONY	proposed	77.046747	28.470083
264	22	ITI STAFF COLONY	proposed	77.046304	28.469597
217	21	GOVT. GIRLS COLLAGE	proposed	77.042750	28.467647
390	21	GOVT. GIRLS COLLAGE	proposed	77.043497	28.467911
213	20	PAREL NAGAR STATE BANK	proposed	77.039618	28.465700
389	20	STATE BANK	proposed	77.039831	28.466113
203	19	JACOB PURA	proposed	77.029777	28.464198
355	19	JACOB PURA	proposed	77.029880	28.464393
354	18	MIYAN WALI COLONY	proposed	77.027225	28.467271
200	18	MIYAN WALI COLONY	proposed	77.027272	28.466971
353	17	BHIMNAGAR CHOWK	proposed	77.023512	28.469716
250	17	BHIMNAGAR CHOWK	proposed	77.023578	28.469920
352	16	VISHWAKARMA CHOWK	proposed	77.018478	28.473379
191	16	BHIMNAGAR	proposed	77.018534	28.473524
351	15	VISHWAKARMA CHOWK	proposed	77.017720	28.474224
252	15	VISHWAKARMA CHOWK	proposed	77.017522	28.474095
344	14	CHINTPURNI MANDIR	proposed	77.016255	28.477258
188	14	CHINTPURNI MANDIR	proposed	77.015926	28.477404
345	13	SECTOR 5	proposed	77.014813	28.479875
187	13	SECTOR 5	proposed	77.014942	28.480110
346	12	LAXMAN VIHAR / SNEH HOSPITAL	proposed	77.014467	28.481245
253	12	LAXMAN VIHAR / SNEH HOSPITAL	proposed	77.014183	28.481279
348	11	APNA ENCLAVE	proposed	77.013180	28.484146
349	11	APNA ENCLAVE	proposed	77.013035	28.483800
347	10	DAULATABAD	proposed	77.011403	28.485030
185	10	DANLATABAD FLYOVER	proposed	77.011737	28.485216
343	9	GURUGRAM RAILWAY STATION	proposed	77.008790	28.485545
265	9	GURUGRAM RAILWAY STATION	proposed	77.008672	28.485439
342	8	RAJENDRA PARK	proposed	77.004253	28.488332
181	8	RAJENDRA PARK	proposed	77.004604	28.488351
339	7	RAJENDRA PARK MORE	proposed	77.000057	28.492542
177	7	RAJENDRA PARK MORE	proposed	77.000017	28.492720
340	6	HANUMAN MANDIR DAULATABAD	proposed	76.998696	28.493206
341	6	HANUMAN MANDIR DAULATABAD	proposed	76.998611	28.493427
338	5	GOVT SCHOOL	proposed	76.995346	28.495632
174	5	GOVT. SCHOOL	proposed	76.995262	28.495797
274	4	DAULATABAD	proposed	76.994632	28.500140
178	3	SECTOR 109	proposed	77.002262	28.507339
273	2	BABUPUR VILLAGE	proposed	76.998847	28.510924

173	1	SOBHA CITY	proposed	76.995380	28.514562
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Note:

- 1 * It is proposed to repair these bus stop (or) construction of new structure for making them functional
- 2 ** Need to be removed/relocated; as these bus stops are placed near to the existing BQS and creating confusion
- 3 # Proposed Name for the existing bus stop which are not having any name at present.

Bus Route :Sector 2 to Ghata Village					
Bus type : Non AC					
Stop no	Route wise stop no	Bus Stop Name	Type	X	Y
33	33	SECTOR 55	proposed	77.105094	28.427768
34	33	SAHYOG APARTMENT	proposed	77.105263	28.4263
74	32	METRO PILLOR NO 203	proposed	77.104773	28.434445
75	32	METRO PILLAR NO 203	proposed	77.104543	28.433649
30	31	VATIKA BUSINESS CENTER	proposed	77.103013	28.439995
31	31	VATIKA BUSINESS CENTER	proposed	77.102487	28.439358
76	30	SECTOR 53/54 METRO	proposed	77.100934	28.445933
29	30	SECTOR 53/54 METRO	proposed	77.100603	28.444957
77	29	HORIZON PLAZA PHASE 5	proposed	77.099008	28.451727
28	29	HORIZON PLAZA PHASE 5	proposed	77.097957	28.452667
26	28	SECTOR 42 /43	proposed	77.096896	28.458645
27	28	SECTOR 43/45	proposed	77.096485	28.457961
24	27	SECTOR 27 JUNCTION	proposed	77.097654	28.463593
25	27	SEC 27 JUNCTION	proposed	77.097432	28.463364
22	26	NADAR SCHOOL	proposed	77.102136	28.463753
23	26	NADAR SCHOOL	proposed	77.102353	28.463906
235	25	KHUSHBOO CHOWK	proposed	77.108853	28.468489
330	25	KHUSHBOO CHOWK	proposed	77.108804	28.468909
236	24	SIKANDERPUR	proposed	77.110061	28.479425
329	24	ARAVALLI BIO DIVERSITY PARK	proposed	77.110491	28.481945
234	23	NEELKANTH HOSPITAL NATTHUPUR	proposed	77.107321	28.483704
328	23	NEELKANTH HOSPITAL NATTHUPUR	proposed	77.107236	28.483488
242	22	NATTHUPUR VILLAGE	proposed	77.105668	28.486238
327	22	NATTHUPUR VILLAGE	proposed	77.105476	28.486224
233	21	TOTA RAM CHOWK	proposed	77.104093	28.488516
326	21	TOTA RAM CHOWK	proposed	77.104117	28.488349
232	20	PRAJAPAT CHOUPAL	proposed	77.101504	28.488854
325	20	PRAJAPAT CHOUPAL	proposed	77.101889	28.488621
272	19	DLF PHASE 3	proposed	77.102378	28.49153
324	19	DLF PHASE 3	proposed	77.102375	28.49135
271	18	MOULSARI ARCADE	proposed	77.103304	28.495605
323	18	MOULSARI ARCADE	proposed	77.103077	28.495598
243	17	W - 11 , PHASE III	proposed	77.099107	28.49788
322	17	W - 11 , PHASE III	proposed	77.099499	28.497843
231	16	MICROMAX MOULSARI AVENUE	proposed	77.095084	28.500312
238	16	MICROMAX MOULSARI AVENUE	proposed	77.095521	28.500323
164	15	SHANKAR CHOWK	proposed	77.091404	28.501626
165	15	SHANKAR CHOWK	proposed	77.092001	28.501377
162	14	INDUS BANK INDIA	proposed	77.088467	28.498324
163	14	INDUS BANK INDIA	proposed	77.089622	28.498761
320	13	UDYOG VIHAR PAHSE 4 PARK	proposed	77.082506	28.498322
321	13	UDYOG VIHAR PAHSE 4 PARK	proposed	77.082442	28.498462
230	12	SECTOR 19 / PHASE 3	proposed	77.080311	28.500071

319	12	SECTOR 19 / PHASE 3	proposed	77.080357	28.499895
225	11	JAWALA MILL CHOWK	proposed	77.068777	28.504004
295	11	JAWALA MILL CHOWK	proposed	77.06835	28.503343
275	10	HUDA MARKET SEC 22	proposed	77.063518	28.50277
286	10	HUDA MARKET SEC 22	proposed	77.062829	28.502573
223	9	TAU DEVILAL PARK	proposed	77.05761	28.502891
294	9	TAU DEVILAL PARK	proposed	77.057389	28.502819
220	8	IMT GURUGRAM	proposed	77.051661	28.506349
293	8	IMT GURUGRAM	proposed	77.052142	28.50624
290	7	SECTOR 23 A GATE 2	proposed	77.048039	28.507904
291	7	SECTOR 23 A GATE 2	proposed	77.04774	28.50812
292	6	SECTOR 23 A GATE 3	proposed	77.0456	28.508878
237	6	SECTOR 23/ 23A & AMP	proposed	77.045081	28.50891
287	5	REZANG LA WAR MEMORIAL 1	proposed	77.043006	28.50979
288	5	REZANG LA WAR MEMORIAL 1	proposed	77.042767	28.509706
215	4	REZANG LA CHOWK	proposed	77.041026	28.510469
289	4	REZANG LA WAR MEMORIAL 2	proposed	77.040698	28.510482
212	3	CARTERPURI VILLAGE	proposed	77.038621	28.506604
302	3	CARTERPURI VILLAGE	proposed	77.039026	28.506693
206	2	ACP OFFICE	proposed	77.03471	28.503427
303	2	APC OFFICE	proposed	77.034432	28.503569
304	1	KRISHNA CHOWK TEMPLE	proposed	77.027865	28.501453
201	1	KRISHNA CHOWK TEMPLE	proposed	77.028313	28.50155

Note:

- 1 * It is proposed to repair these bus stop (or) construction of new structure for making them functional
- 2 ** Need to be removed/relocated; as these bus stops are placed near to the existing BQS and creating confusion
- 3 # Proposed Name for the existing bus stop which are not having any name at present.

Bus Route : Huda city center to Basai Chowk**Bus type : Non AC**

Stop no	Route wise stop no	Bus Stop Name	Type	X	Y
68	27	TAJ CITY CENTRE** #	Re-locate/ Remove	77.070247	28.456810
69	27	TAJ CITY CENTRE #	Proposed Name for existing stop	77.070422	28.457024
70	27	FORTIS MEMORIAL RESEARCH INSTITUTE #	Proposed Name for existing stop	77.071304	28.457550
19	26	RADHA KRISHNA MANDIR JHARSA #	Proposed Name for existing stop	77.068036	28.454347
20	26	RADHA KRISHNA MANDIR JHARSA #	Proposed Name for existing stop	77.068447	28.454423
18	25	SECTOR 31 RED LIGHT CROSSING	proposed	77.064828	28.450567
67	25	BLOCK K- SILOKHERA #	Proposed Name for existing stop	77.064531	28.450645
423	24	SECTOR 40 /BLOCK P	proposed	77.062436	28.450808

394	24	SECTOR 40 /BLOCK P	proposed	77.062819	28.450761
395	23	POCKET N	proposed	77.060245	28.452490
396	23	POCKET N	proposed	77.060240	28.452700
397	22	MINI HUDA MARKET SEC 31	proposed	77.056375	28.454914
398	22	MINI HUDA MARKET SEC 31	proposed	77.057209	28.454915
438	21	SECTOR 31A	proposed	77.054923	28.453659
399	21	SRI KRISHNA MANDIR JHARSA	proposed	77.055141	28.453699
426	20	SEC 31 GATE 4	proposed	77.053425	28.452022
436	20	SEC 31 GATE 4	proposed	77.053400	28.451745
427	19	HSIIDC APARTMENT SEC 31	proposed	77.051310	28.449683
437	19	HSIIDC APARTMENT SEC 31	proposed	77.051572	28.449814
400	18	DAINIK BAZAAR	proposed	77.048210	28.446861
401	18	SAINI PURA	proposed	77.047051	28.446855
402	17	ORBIT HOSPITAL	proposed	77.044654	28.449276
403	16	SECTOR 15 PART 1	proposed	77.040377	28.453593
404	16	SECTOR 15 PART 1	proposed	77.040403	28.453365
405	15	OFFICERS COLONY	proposed	77.036329	28.457074
406	15	OFFICERS COLONY	proposed	77.036053	28.457630
205	14	CIVIL HOSPITAL	proposed	77.032584	28.461492
356	14	CIVIL HOSPITAL	proposed	77.032535	28.461186
411	13	KABIR BHAVAN CHOWK	proposed	77.022726	28.463170
412	13	KABIR BHAVAN CHOWK	proposed	77.022978	28.463192
413	12	SHREE PREM MANDIR	proposed	77.021117	28.466313
434	12	SHREE PREM MANDIR	proposed	77.021263	28.466527
372	11	NEW COLONY	proposed	77.019683	28.469458
193	11	NEW COLONY	proposed	77.019824	28.469636
414	10	MG MALL	proposed	77.018765	28.471350
435	10	MG MALL	proposed	77.019071	28.471294
415	9	VISHWAKARMA CHOWK	proposed	77.016822	28.473104
432	9	VISHWAKARMA CHOWK	proposed	77.016922	28.473245
416	8	SHIRPIRI	proposed	77.013891	28.472016
433	8	SHIRPIRI	proposed	77.013714	28.472019
417	7	ARYA VIDYA MANDIR SCHOOL	proposed	77.008175	28.469820
418	6	FIROZ GANDHI COLONY 2	proposed	77.003895	28.468425
419	5	SECTOR 9 MOR	proposed	77.001305	28.467511
430	5	SECTOR 9 MOR	proposed	77.000962	28.467472
420	4	SECTOR 9 L BOLCK	proposed	76.995952	28.465655
431	4	SECTOR 9 L BOLCK	proposed	76.995444	28.465621
421	3	VIDYA MEDICAL CENTER	proposed	76.990283	28.462735
429	3	VIDYA MEDICAL CENTER	proposed	76.990146	28.462686
424	2	BHAWANI ENCLAVE	proposed	76.991120	28.460415
428	2	BHAWANI ENCLAVE	proposed	76.990911	28.460578
422	1	BASAI CHOWK	proposed	76.990380	28.457796
425	1	BASAI CHOWK	proposed	76.990310	28.457981

Note:

- 1 * It is proposed to repair these bus stop (or) construction of new structure for making them functional
- 2 ** Need to be removed/relocated; as these bus stops are placed near to the existing BQS and creating confusion
- 3 # Proposed Name for the existing bus stop which are not having any name at present.

Bus Route : Huda city center to Huda city center loop (Mudrika)					
Bus type : Non AC					
Stop no	Route wise stop no	Bus Stop Name	Type	X	Y
57	47	POLICE STATION , SEC 29	proposed	77.073697	28.463005
58	46	MILENNIUM PLAZA	proposed	77.073370	28.465199
227	45	IFFCO CHOWK METRO STATION	proposed	77.072378	28.471467
378	45	IFFCO CHOWK METRO STATION	proposed	77.072822	28.471088
59	44	IFFCO CHOWK	proposed	77.070613	28.477631
60	43	IFFCO CHOWK	proposed	77.069642	28.477800
88	42	IFFCO CHOWK	proposed	77.069496	28.478720
239	41	SBI , GURUKUL	proposed	77.065619	28.482335
266	40	MARUTI WORKSHOP	proposed	77.059640	28.486685
219	39	SUKHRALI ENCLAVE	proposed	77.049928	28.482011
249	39	SUKHRALI ENCLAVE	proposed	77.050161	28.482724
316	38	ATUL KATARIA CHOWK	proposed	77.047207	28.481682
248	38	ATUL KATARIA CHOWK	proposed	77.047404	28.481561
267	37	PATTHAR MARKET	proposed	77.043711	28.480798
315	37	PATTHAR MARKET	proposed	77.043422	28.480937
314	36	KRISHNA MANGALAM GARDEN	proposed	77.040521	28.479855
313	35	CRPF CAMP CHOWK	proposed	77.034696	28.478559
210	35	CRPF CAMP CHOWK	proposed	77.034782	28.478423
312	34	SHEETLA MATA MANDIR	proposed	77.031332	28.479256
251	34	SHEETLA MATA MANDIR	proposed	77.031462	28.478936
311	33	PARADISE GARDEN	proposed	77.027875	28.479901
198	33	SHEETLA MATA MANDIR	proposed	77.027808	28.480091
310	32	SECTOR 5 GOVERNMENT SCHOOL	proposed	77.022589	28.482303
194	32	SECTOR 5 GOVERNMENT SCHOOL	proposed	77.022272	28.482257
268	31	SECTOR 5 CHOWK	proposed	77.020356	28.484457
309	31	SECTOR 5 CHOWK	proposed	77.020641	28.484419
442	30	SECTOR 5 MARKET	Proposed	77.015939	28.481144
441	29	SECTOR 3A	Proposed	77.013598	28.480445
179	28	SURYA VIHAR	proposed	77.002848	28.476587
350	28	SURYA VIHAR	proposed	77.002598	28.476661
418	27	FIROZ GANDHI COLONY 2	proposed	77.003895	28.468425
419	26	SECTOR 9 MOR	proposed	77.001305	28.467511
430	26	SECTOR 9 MOR	proposed	77.000962	28.467472
420	25	SECTOR 9 L BOLCK	proposed	76.995952	28.465655
431	25	SECTOR 9 L BOLCK	proposed	76.995444	28.465621
421	24	VIDYA MEDICAL CENTER	proposed	76.990283	28.462735
429	24	VIDYA MEDICAL CENTER	proposed	76.990146	28.462686
424	23	BHAWANI ENCLAVE	proposed	76.991120	28.460415
428	23	BHAWANI ENCLAVE	proposed	76.990911	28.460578
422	22	BASAI CHOWK	proposed	76.990380	28.457796
425	22	BASAI CHOWK	proposed	76.990310	28.457981
439	21	SARASWATI ENCLAVE	Proposed	76.998436	28.446391
440	21	SARASWATI ENCLAVE	Proposed	76.998370	28.446365
245	20	SECTOR 37	proposed	77.000194	28.443472
380	20	BEST CHILD SPL HOSPITAL	proposed	77.000369	28.443108

184	19	MEENAKSHI PUBLIC SCHOOL-	proposed	77.005859	28.438714
379	19	FAMILY MULTI SPL HOSPITAL	proposed	77.005741	28.438536
139	18	HERO HONDA CHOWK	proposed	77.009255	28.436577
140	18	HERO HONDA CHWOK	proposed	77.009143	28.436434
111	17	HERO HONDA	proposed	77.011617	28.435083
112	17	HERO HONDA	proposed	77.011505	28.434932
1	16	SEC 34 NAGAR NIGAM	proposed	77.017990	28.430891
2	16	SEC 34 NAGAR NIGAM	proposed	77.017800	28.430815
3	15	MARBLE MARKET SEC- 33/34	proposed	77.020648	28.429115
4	15	MARBLE MARKET SEC- 33/34	proposed	77.019784	28.429446
5	14	CONGNIZANT/ UNITEC RESIDENCY	proposed	77.027848	28.426586
6	14	CONGNIZANT/ UNITEC RESIDENCY	proposed	77.028238	28.426393
7	13	CENTRAL PART 2	proposed	77.031532	28.427473
8	13	CENTRAL PARK 2	proposed	77.030989	28.427080
9	12	GATE 3, SECTOR 38	proposed	77.043076	28.430160
10	12	GATE 3, SECTOR 38	proposed	77.043051	28.429787
11	11	PETROL PUMP , SEC - 47	proposed	77.046586	28.432065
12	11	PETROL PUMP , SEC - 47	proposed	77.046958	28.431995
63	10	SUKHMANI HOSPITAL #	Proposed Name for existing stop	77.048344	28.433887
13	9	BAKHTAWAR CHOWK *	Repair	77.050760	28.435976
72	9	BAKHTAWAR CHOWK #	Proposed Name for existing stop	77.050678	28.436118
14	8	UNITECH CYBER CHOWK	proposed	77.055241	28.441025
15	8	UNITECH CYBER CHOWK	proposed	77.055900	28.441272
64	7	CYBER PARK 2 #	Proposed Name for existing stop	77.057784	28.443611
65	7	CYBER PARK 2 #	Proposed Name for existing stop	77.057985	28.443495
16	6	PREMIA MEDICARE HOSPITAL	proposed	77.060199	28.446185
17	6	PREMIA MEDICARE HOSPITAL	proposed	77.060377	28.445921
66	5	PREMIA MEDICARE #	Proposed Name for existing stop	77.061447	28.447418
18	4	SECTOR 31 RED LIGHT CROSSING	proposed	77.064828	28.450567
67	4	BLOCK K- SILOKHERA #	Proposed Name for existing stop	77.064531	28.450645
19	3	RADHA KRISHNA MANDIR JHARSA #	Proposed Name for existing stop	77.068036	28.454347
20	3	RADHA KRISHNA MANDIR JHARSA #	Proposed Name for existing stop	77.068447	28.454423
68	2	TAJ CITY CENTRE** #	Re-locate/ Remove	77.070247	28.456810
69	2	TAJ CITY CENTRE #	Proposed Name for existing stop	77.070422	28.457024
70	2	FORTIS MEMORIAL RESEARCH INSTITUTE #	Proposed Name for existing stop	77.071304	28.457550
21	1	HUDA CITY BUS STOP	proposed	77.072604	28.458172

Note:

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It is proposed to repair these bus stop (or) construction of new structure for making them functional

- 2 ** *Need to be removed/relocated; as these bus stops are placed near to the existing BQS and creating confusion*
- 3 # *Proposed Name for the existing bus stop which are not having any name at present.*

Bus Route : Gurugram Bus stand to Farrukh Nagar					
Bus type : Non AC					
Stop no	Route wise stop no	Bus Stop Name	Type	X	Y
207	23	GURUGRAM BUS STATION	proposed	77.033236	28.464847
388	23	GURUGRAM BUS STATION	proposed	77.033573	28.465276
205	22	CIVIL HOSPITAL	proposed	77.032584	28.461492
356	22	CIVIL HOSPITAL	proposed	77.032535	28.461186
407	21	GURUDWARA CHOWK/ AGGRAWAL DHARAMSALA CHOWK	proposed	77.031012	28.459235
408	21	GURUDWARA CHOWK/ AGGRAWAL DHARAMSALA CHOWK	proposed	77.030846	28.459429
409	20	JAIN LAND COMPLEX SOHNA CHOWK	proposed	77.027068	28.458424
410	20	JAIN LAND COMPLEX SOHNA CHOWK	proposed	77.027132	28.458615
373	19	BHUTESWAR CHOWK, SHIVAJI NAGAR	proposed	77.023249	28.457180
197	19	BHUTESWAR CHOWK, SHIVAJI NAGAR	proposed	77.023326	28.457341
374	18	SARAH HOSPITAL	proposed	77.019189	28.456984
262	18	SARAH HOSPITAL	proposed	77.019287	28.456841
375	17	PATAUDI CHOWK	proposed	77.016855	28.456992
189	17	PATAUDI CHOWK	proposed	77.016819	28.456845
376	16	RAVI NAGAR	proposed	77.004207	28.456928
183	16	RAVI NAGAR	proposed	77.004687	28.457111
377	15	VISHWAKARMA COLONY	proposed	76.999543	28.457205
176	15	VISHWAKARMA COLONY	proposed	76.999106	28.457037
357	14	BASAI CHOWK	proposed	76.989185	28.457385
358	14	BASAI CHOWK	proposed	76.989059	28.457514
359	13	BASAI VILLAGE	proposed	76.984034	28.457572
172	13	BASAI VILLAGE	proposed	76.984263	28.457671
360	12	BASAI DHANKOT RS	proposed	76.981291	28.461469
261	12	BASAI DHANKOT RS	proposed	76.978155	28.463087
361	11	SECTOR 102 DHANKOT	proposed	76.969985	28.468805
171	11	SECTOR 102 DHANKOT	proposed	76.970040	28.468482
362	10	DHANKOT VILLAGE	proposed	76.957895	28.472250
170	10	DHANKOT VILLAGE	proposed	76.958441	28.472253
254	9	CHANDU VILLAGE DAYAVIHAR	proposed	76.936011	28.472332
363	8	CHANDU VILLAGE	proposed	76.922246	28.472086
169	8	CHANDU VILLAGE	proposed	76.922717	28.471972
364	7	BHUDHERA GAON	proposed	76.912171	28.470333
365	7	BHUDHERA GAON	proposed	76.911956	28.470493
366	6	CHDHRANA MORH	proposed	76.899019	28.468980
255	6	SADHRANA MORH	proposed	76.898718	28.469106
260	5	KALIAWAS	proposed	76.888828	28.467580
256	4	SULTANPUR VILLAGE	proposed	76.871300	28.464100
257	4	RAM GOPAL COLLEGE OF PHARMACY	proposed	76.864351	28.463842
168	3	BALAJI COLONY FARUKH NAGAR	proposed	76.835752	28.449975
369	3	BALAJI COLONY FARUKH NAGAR	proposed	76.835818	28.450146
368	2	MR MOTARS	proposed	76.830674	28.448347
259	2	MR MOTARS	proposed	76.830505	28.448466
367	1	FARUKHNAGAR BUS STAND	proposed	76.826517	28.448357

258	1	FARUKHNAGAR BUS STAND	proposed	76.826700	28.448257
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Note:

- 1 * It is proposed to repair these bus stop (or) construction of new structure for making them functional
- 2 ** Need to be removed/relocated; as these bus stops are placed near to the existing BQS and creating confusion
- 3 # Proposed Name for the existing bus stop which are not having any name at present.

Bus Route : Palam Vihar to Gurugram Bus stand					
Bus type : Non AC					
Stop no	Route wise stop no	Bus Stop Name	Type	X	Y
190	18	VSR 114	proposed	77.017538	28.537343
331	18	VSR 114	proposed	77.017788	28.537095
270	17	TATA HOUSING GURGAON GATE	proposed	77.019215	28.533249
332	17	TATA HOUSING GURGAON GATE	proposed	77.019082	28.532981
269	16	SECTOR 112/113	proposed	77.020713	28.528825
333	16	SECTOR 112/ 113	proposed	77.020579	28.528896
334	15	SECTOR 111	proposed	77.022382	28.523289
335	15	SECTOR 111	proposed	77.022226	28.523381
336	14	NEW PALAM VIHAR PHASE 2	proposed	77.023787	28.517716
196	14	NEW PALAM VIHAR PHASE 2	proposed	77.024255	28.516785
337	13	POST OFFICE PALAM VIHAR	proposed	77.026272	28.509106
199	13	POST OFFICE PALAM VIHAR	proposed	77.026440	28.509229
304	12	KRISHNA CHOWK TEMPLE	proposed	77.027865	28.501453
201	12	KRISHNA CHOWK TEMPLE	proposed	77.028313	28.501550
305	11	PARK VIEW RESIDENCY	proposed	77.022736	28.497359
195	11	PARK VIEW RESIDENCY	proposed	77.022815	28.497734
306	10	ASHOK VIHAR PHASEIII EXTENSION	proposed	77.020416	28.494617
307	10	ASHOK VIHAR PHASEIII EXTENSION	proposed	77.020484	28.494451
192	9	ASHOK VIHAR PHASE 2 PETROL PUMP	proposed	77.019564	28.490327
308	9	ASHOK VIHAR PHASE 2 PETROL PUMP	proposed	77.019731	28.490478
268	8	SECTOR 5 CHOWK	proposed	77.020356	28.484457
309	8	SECTOR 5 CHOWK	proposed	77.020641	28.484419
194	7	SECTOR 5 GOVERNMENT SCHOOL	proposed	77.022272	28.482257
310	7	SECTOR 5 GOVERNMENT SCHOOL	proposed	77.022589	28.482303
198	6	SHEETLA MATA MANDIR	proposed	77.027808	28.480091
311	6	PARADISE GARDEN	proposed	77.027875	28.479901
312	5	SHEETLA MATA MANDIR	proposed	77.031332	28.479256
251	5	SHEETLA MATA MANDIR	proposed	77.031462	28.478936
313	4	CRPF CAMP CHOWK	proposed	77.034696	28.478559
210	4	CRPF CAMP CHOWK	proposed	77.034782	28.478423
209	3	RAJEEV NAGAR	proposed	77.034380	28.473646
370	3	RAVI NAGAR	proposed	77.034561	28.473379
371	2	SEC 12 CHOWK	proposed	77.034217	28.470131
208	2	SEC 12 CHOWK	proposed	77.033959	28.470093
388	1	GURUGRAM BUS STATION	proposed	77.033573	28.465276
207	1	GURUGRAM BUS STATION	proposed	77.033236	28.464847

Note:

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- 2 ** Need to be removed/relocated; as these bus stops are placed near to the existing BQS and creating confusion
- 3 # Proposed Name for the existing bus stop which are not having any name at present.

Bus Route : Badhushapur to IFFCO Chowk					
Bus type : AC					
Stop no	Route wise stop no	Bus Stop Name	Type	X	Y
93	25	VATIKA MOTHER & AMP; CHILD HOSPITAL	proposed	77.044879	28.400853
107	25	BADHUSHAPUR MORE	proposed	77.046117	28.401561
94	24	VATIKA CITY BUS STOP	proposed	77.051823	28.403970
95	24	VATIKA CITY BUS STOP	proposed	77.051074	28.403365
96	23	ST XAVIAR'S HIGH SCHOOL	proposed	77.059458	28.406847
97	23	ST XAVIAR'S HIGH SCHOOL	proposed	77.059590	28.406571
98	22	DPS INTERNATIONAL	proposed	77.063974	28.408566
99	22	DPS INTERNATIONAL	proposed	77.064116	28.408326
100	21	TRADE TOWER	proposed	77.072673	28.411853
101	21	TRADE TOWER	proposed	77.072855	28.411532
102	20	SEC 57 CHOWK	proposed	77.082080	28.414988
103	20	SEC 57 CHOWK	proposed	77.082181	28.414694
104	19	VISION TOWER SEC 62	proposed	77.086293	28.416141
105	19	VISION TOWER SEC 62	proposed	77.086404	28.415883
106	18	RAJESH PILOT GUJAR CHOWK	proposed	77.089563	28.416791
38	17	RAJESH PILOT GUJAR CHOWK	proposed	77.090970	28.418578
39	17	RAJESH PILOT GUJAR CHOWK	proposed	77.091285	28.418946
40	16	NATIONAL EYE CENTER	proposed	77.091418	28.420090
41	15	SECTOR 56 MOR	proposed	77.091084	28.425865
42	15	SECTOR 56 MOR	proposed	77.091382	28.425889
43	14	BOTANICAL GARDAN	proposed	77.090970	28.432099
44	14	BOTANICAL GARDAN	proposed	77.091096	28.432870
45	13	AVIATION HEIGHTS	proposed	77.090250	28.436445
46	13	AVIATION HEIGHTS	proposed	77.090526	28.436392
47	12	WAZIRABAD DHANI CHOWK	proposed	77.088138	28.439848
48	12	WAZIRABAD DHANI CHOWK	proposed	77.088419	28.439951
49	11	PETROLPUMP SEC 52	proposed	77.084942	28.442260
50	11	PETROLPUMP SEC 52	proposed	77.084694	28.442756
71	10	R.D.CITY GATE 1 * #	Repair	77.082064	28.444972
51	9	KANAHAI JUNCTION	proposed	77.080064	28.446769
52	8	KANHAI COLONY	proposed	77.078528	28.448142
53	8	KANHAI COLONY	proposed	77.078724	28.448304
54	7	GOLD SOOK	proposed	77.076234	28.451285
55	7	GOLD SOOK	proposed	77.076568	28.451390
73	6	APPAREL HOUSE SEC 44	proposed	77.074828	28.453249
56	5	FORTIS MEMORIAL RESEARCH INSTITUTE	proposed	77.074040	28.457873
57	4	POLICE STATION , SEC 29	proposed	77.073697	28.463005
58	3	MILLENNIUM PLAZA	proposed	77.073370	28.465199
227	2	IFFCO CHOWK METRO STATION	proposed	77.072378	28.471467
378	2	IFFCO CHOWK METRO STATION	proposed	77.072822	28.471088
59	1	IFFCO CHOWK	proposed	77.070613	28.477631
60	1	IFFCO CHOWK	proposed	77.069642	28.477800

Note:

- 1 * It is proposed to repair these bus stop (or) construction of new structure for making them functional
- 2 ** Need to be removed/relocated; as these bus stops are placed near to the existing BQS and creating confusion

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Proposed Name for the existing bus stop which are not having any name at present.

Bus Route : Gurugram Bus stand to Ambience Mall					
Bus type : AC					
Stop no	Route wise stop no	Bus Stop Name	Type	X	Y
388	18	GURUGRAM BUS STATION	proposed	77.033573	28.465276
207	18	GURUGRAM BUS STATION	proposed	77.033236	28.464847
409	17	JAIN LAND COMPLEX SOHNA CHOWK	proposed	77.027068	28.458424
410	17	JAIN LAND COMPLEX SOHNA CHOWK	proposed	77.027132	28.458615
386	16	COMMISSONER OF POLICE	proposed	77.029371	28.455181
202	16	SCERT OFFICE	proposed	77.029100	28.455245
385	15	HARYANA AGRICULTURE DEPT	proposed	77.030950	28.451228
204	15	SECRETARIET	proposed	77.031043	28.451712
108	14	RAJEEV CHOWK	proposed	77.032862	28.447549
148	14	RAJEEV CHOWK	proposed	77.031543	28.446344
149	13	RAJEEV CHOWK	proposed	77.036626	28.446095
150	12	JARSHA CHOWK	proposed	77.041173	28.451642
151	12	JARSHA CHOWK	proposed	77.043036	28.452630
152	11	STAR MALL	proposed	77.049851	28.460669
153	11	STAR MALL	proposed	77.050894	28.460839
154	10	SIGNATURE TOWER	proposed	77.056747	28.467391
155	10	SIGNATURE TOWER	proposed	77.056109	28.467675
156	9	TEHREKIA PARK	proposed	77.062053	28.472740
157	9	TEHREKIA PARK	proposed	77.063055	28.472874
88	8	IFFCO CHOWK	proposed	77.069496	28.478720
60	8	IFFCO CHOWK	proposed	77.069642	28.477800
61	7	HERITAGE VILLAGE	proposed	77.074916	28.483994
62	6	GENPACT NH8 , FOB	proposed	77.077076	28.486244
158	5	ARITEL	proposed	77.081541	28.491151
159	5	AIRTEL OVER BRIDGE	proposed	77.082022	28.490813
160	4	ASF TOWER	proposed	77.085764	28.495468
161	4	INDUS TOWER LIMITED	proposed	77.086452	28.495325
162	3	INDUS BANK INDIA	proposed	77.088467	28.498324
163	3	INDUS BANK INDIA	proposed	77.089622	28.498761
164	2	SHANKAR CHOWK	proposed	77.091404	28.501626
165	2	SHANKAR CHOWK	proposed	77.092001	28.501377
166	1	AMBIENCE MALL	proposed	77.094675	28.506040
167	1	AMBIENCE MALL	proposed	77.095272	28.506013

Note:

- | | | |
|---|----|---|
| 1 | * | It is proposed to repair these bus stop (or) construction of new structure for making them functional |
| 2 | ** | Need to be removed/relocated; as these bus stops are placed near to the existing BQS and creating confusion |
| 3 | # | Proposed Name for the existing bus stop which are not having any name at present. |

Bus Route : Dundaheera to Gurugram Bus stand**Bus type : AC**

Stop no	Route wise stop no	Bus Stop Name	Type	X	Y
229	33	OLD GURGRAM ROAD, DUNDAHERA	proposed	77.079369	28.516872
228	32	DUNDAHERA	proposed	77.074118	28.511017
298	32	DUNDAHERA	proposed	77.074237	28.510753
297	31	CANDOR	proposed	77.072792	28.508556
244	31	CANDOR	proposed	77.073358	28.509777
226	30	SRI KRISHNA CHOWK	proposed	77.071134	28.506759
299	30	SRI KRISHNA CHOWK	proposed	77.071051	28.506258
225	29	JAWALA MILL CHOWK	proposed	77.068777	28.504004
295	29	JAWALA MILL CHOWK	proposed	77.068350	28.503343
296	28	HYATT PLACE	proposed	77.065900	28.500938
241	28	HYATT PLACE	proposed	77.065737	28.500351
240	27	MARUTI UDYOG GATE 1	proposed	77.062903	28.497353
300	26	MARUTI UDYOG GATE 2	proposed	77.060394	28.494519
301	26	MARUTI UDYOG GATE 2	proposed	77.060925	28.494734
224	25	SARHANAL MOR	proposed	77.058507	28.492441
317	25	SARHANAL MOR	proposed	77.058861	28.492520
222	24	PASCO CHOWK	proposed	77.055822	28.489261
318	24	PASCO CHOWK	proposed	77.056336	28.489497
266	23	MARUTI WORKSHOP	proposed	77.059640	28.486685
239	22	SBI , GURUKUL	proposed	77.065619	28.482335
88	21	IFFCO CHOWK	proposed	77.069496	28.478720
59	20	IFFCO CHOWK	proposed	77.070613	28.477631
60	20	IFFCO CHOWK	proposed	77.069642	28.477800
227	19	IFFCO CHOWK METRO STATION	proposed	77.072378	28.471467
378	19	IFFCO CHOWK METRO STATION	proposed	77.072822	28.471088
58	18	MILLENNIUM PLAZA	proposed	77.073370	28.465199
57	17	POLICE STATION , SEC 29	proposed	77.073697	28.463005
56	16	FORTIS MEMORIAL RESEARCH INSTITUTE	proposed	77.074040	28.457873
73	15	APPAREL HOUSE SEC 44	proposed	77.074828	28.453249
54	14	GOLD SOOK	proposed	77.076234	28.451285
55	14	GOLD SOOK	proposed	77.076568	28.451390
52	13	KANHAI COLONY	proposed	77.078528	28.448142
53	13	KANHAI COLONY	proposed	77.078724	28.448304
51	12	KANAHI JUNCTION	proposed	77.080064	28.446769
71	11	R.D.CITY GATE 1 * #	Repair	77.082064	28.444972
49	10	PETROL PUMP SEC 52	proposed	77.084942	28.442260
50	10	PETROL PUMP SEC 52	proposed	77.084694	28.442756
47	9	WAZIRABAD DHANI CHOWK	proposed	77.088138	28.439848
48	9	WAZIRABAD DHANI CHOWK	proposed	77.088419	28.439951
45	8	AVIATION HEIGHTS	proposed	77.090250	28.436445
46	8	AVIATION HEIGHTS	proposed	77.090526	28.436392
43	7	BOTANICAL GARDAN	proposed	77.090970	28.432099
44	7	BOTANICAL GARDAN	proposed	77.091096	28.432870
41	6	SECTOR 56 MOR	proposed	77.091084	28.425865
42	6	SECTOR 56 MOR	proposed	77.091382	28.425889
40	5	NATIONAL EYE CENTER	proposed	77.091418	28.420090
91	4	RAJESH PILOT GUJAR CHOWK	proposed	77.093024	28.417393
92	4	RAJESH PILOT GUJAR CHOWK	proposed	77.092994	28.417130
38	4	RAJESH PILOT GUJAR CHOWK	proposed	77.090970	28.418578
39	4	RAJESH PILOT GUJAR CHOWK	proposed	77.091285	28.418946
36	3	CLUB FLORENCE	proposed	77.096531	28.417068
37	3	CLUB FLORENCE	proposed	77.095641	28.417383
89	2	HARYANA VIDYUT PRASARAN NIGAM	proposed	77.103935	28.419245

90	2	HARYANA VIDYUT PRASARAN NIGAM	proposed	77.103510	28.418764
33	1	SECTOR 55	proposed	77.105094	28.427768
34	1	SAHYOG APARTMENT	proposed	77.105263	28.426300

Note:

- | | | |
|---|----|--|
| 1 | * | <i>It is proposed to repair these bus stop (or) construction of new structure for making them functional</i> |
| 2 | ** | <i>Need to be removed/relocated; as these bus stops are placed near to the existing BQS and creating confusion</i> |
| 3 | # | <i>Proposed Name for the existing bus stop which are not having any name at present.</i> |

7.5 Route wise Bus depot allocation

To minimize the dead mileage of the buses in the study area, two new bus depots were identified and routes were allocated to those bus depots to reduce the dead mileage of the buses in the study area and which helps in the reduce the operational costs. The table below shows the depot wise route list.

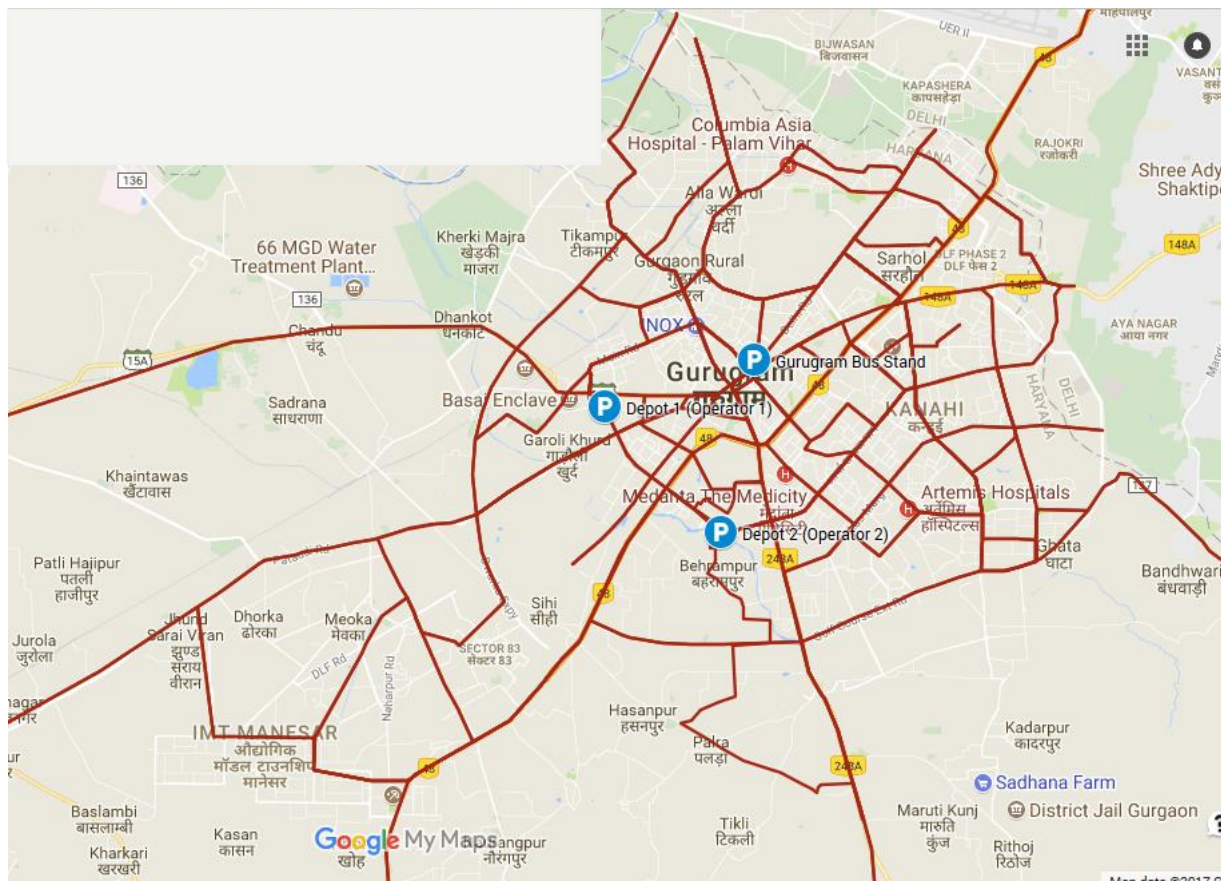
Table 7-1 : Bus Depot wise bus routes allocation

Sr.no	Route Name	Route length (in KM)	Distance (in KM)			Routes allocated	Phasing	Dead mileage
			Gurugram Bus Stand	Depot 1 (Operator 1)	Depot 2 (Operator 2)			
1	Gurugram Bus stand to Bilaspur kalan	30	0.0	5.0	5.9	Depot 1	Phase 1A	5.0
2	Harsaru to Dundhera	11.9	4.7	0.8	3.6	Depot 1	Phase 1A	0.8
3	Huda city center to Dharampuri	13	0.0	3.9	6.1	GBS	Phase 1A	0.0
4	Sector 2 to Ghata Village	19.7	5.1	8.0	10.7	GBS	Phase 1A	5.1
5	Basai Chowk to Huda city center (Via GBS)	11.9	5.9	0.5	4.9	Depot 1	Phase 1A	0.5
6	Gurugram Bus stand to Dhaulkaun	17.4	0.0	6.0	5.9	GBS	Phase 1A	0.0
7	Sohna to Railway station	21.7	1.0	5.7	1.3	Depot 2	Phase 1B	1.3
8	Manesar to Railway station	26	0.8	0.3	3.5	Depot 1	Phase 1B	0.3
9	Gurugram Bus stand to Anand vihar	48	0.0	5.0	5.9	GBS	Phase 1B	0.0
10	Huda city center to Huda city center (via Hero Honda chowk, Railway station)	25.1	1.5	0.0	0.0	Depot 1	Phase 1A	0.0
11	Gurugram Bus stand to Farrukh Nagar	19.5	0.0	0.5	5.9	Depot 1	Phase 1A	0.5
12	Gurugram Bus stand to Ansal University (Mayfiled Garden)	13.9	0.0	5.0	5.9	Depot 2	Phase 1B	5.9
13	Sikanderpur Metro station to Sector 75A	16.2	2.7	4.1	0.0	Depot 2	Phase 1B	0.0
14	IFFCO Chowk to Badshahpur	12.2	4.3	8.8	4.4	Depot 2	Phase 1A	4.4
15	IFFCO Chowk to Palam Vihar	12.6	4.0	10.0	8.3	GBS	Phase 1B	4.0
16	Sec 56 to Dundahera	16.3	7.6	12.4	12.3	GBS	Phase 1A	7.6
17	Gurugram Bus stand to Karol Bagh	31.5	0.0	5.0	5.9	GBS	Phase 1B	0.0
18	Gurugram Bus stand to Palam Vihar	10.5	0.0	5.0	5.9	GBS	Phase 1A	0.0
19	Gurugram Bus stand to Heli Mandi	22.6	0.0	5.0	5.9	GBS	Phase 1B	0.0
20	Huda City Center to Maruti Kunj (Via Badshahpur)	13.2	5.3	10.8	6.4	Depot 2	Phase 1B	6.4
21	Sector 97 to Badshahpur (Via IMT Manesar)	20.7	7.6	9.0	4.4	Depot 2	Phase 1B	4.4
22	Sec 2 to Sec 6A	9.3	7.1	12.0	12.0	GBS	Phase 1B	7.1
23	KIIT College of Engg to Rajeev Chowk	14	0.0	5.7	3.3	Depot 2	Phase 1B	3.3
24	Sec 61 to Green Filed	27.2	10.4	13.6	9.4	Depot 2	Phase 1B	9.4
25	Sector 88A to Palam Vihar	15.1	12.0	5.0	7.8	Depot 1	Phase 1B	5.0
Total Dead Mileage (in KM's)			79.9	146.7	145.9			

Table 7-2 : Depot wise Route dead Kilometres

Bus Depot	Total allocated	Dead Mileage
Gurugram Bus stand	10	23.7
Proposed Depot 1 (near Basai Chowk)	7	12.0
Proposed Depot 2 (Near Subash Chowk)	8	35.3
Total Dead Mileage (in Km)		71.00

*If HSRTC is not providing depot space to operate city buses then the routes which are allocated to same shall operate from depot 1

**Figure 7-7: Proposed Bus Terminal Locations**

To have a minimum dead mileage in the study area, one more depot may be need to proposed at the Dundahera/ Palam Vihar side, which will help in reduce the dead mileage and improve the operational performance of those routes.

CHAPTER 8

Proposal for Bus Route Numbering

8 Proposal for Bus Route Numbering

For improving the bus system and making it more accessible to users, a scientific bus route numbering system has been proposed for Gurugram. The purpose is to develop a simple logic based on which users can easily identify bus routes travel pattern based on numbers. In this chapter, proposed numbering concept has been detailed. The proposed numbering system will require wide publicity of route numbering concept to familiarise the city residents after services are operational.

8.1 Concept of Bus Route Numbering and various Options:

The concept of bus route numbering has been evolved to enable the commuter to understand the route number based on logic. This will help, residents to easily identify the zones in which buses are moving making travel convenient. This will also help to popularise bus system in Gurugram. Various types of bus numbering system have been explored as below.

1. Zone Based Bus Route Numbering System
2. Hierarchical Route based Numbering System
3. Activity Hub based Route Numbering system

Each type of route numbering system is explained in various sections.

8.2 Zone Based Bus Numbering System

For the Gurugram city, bus route concept based on zoning has been adopted. City was broadly divided into 10 zones (0- 9), based on the major popular and distinguished destinations. For better understand of route numbering to the users, NH-8 east direction zones are numbered with odd number zones and west zones are numbered with even number zones. Routes travelling within the west side will have the route with odd numbering and routes travelling within east side will have even numbers. For routes, travelling from west to east direction, route will have both odd and even numbers. In all, Gurugram city was divided into 10 zones, start with “0” (old Gurugram) and ends with “9”. The list below mentions the zone number with major/ identifiable areas in that zone and the figure shows the spatial demarcation of the city by zone wise.

Table 8-1: Zone wise details

Zone type	Zone no	Pre-dominant area
ODD number zones (west side of NH-8)	1	DLF/ Cyber hub
	3	DLF Phase 5 / Sector development
	5	Huda city center
	7	Badshahpur
	9	Sector development and Tikli Village
City center/ Old City	0	Gurugram bus stand/ Old Gurugram
Even number zones (East side of NH-8)	2	Dundahera
	4	Palam Vihar
	6	Railway station
	8	IMT Manesar

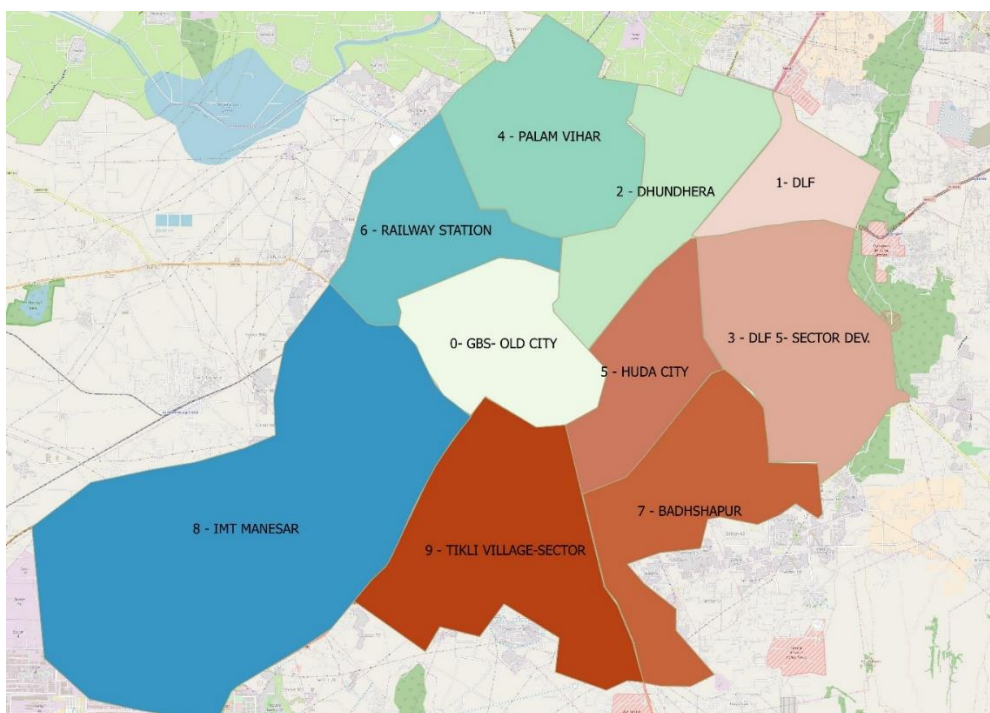
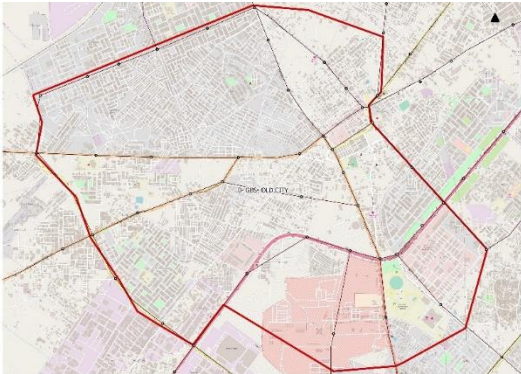
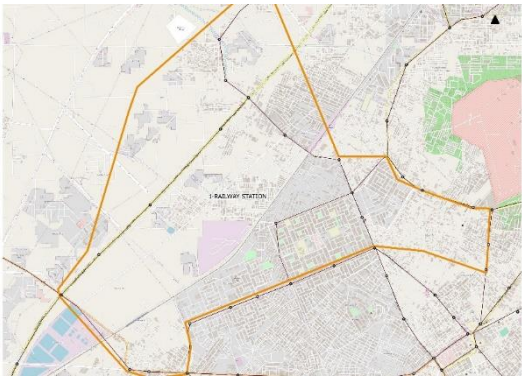
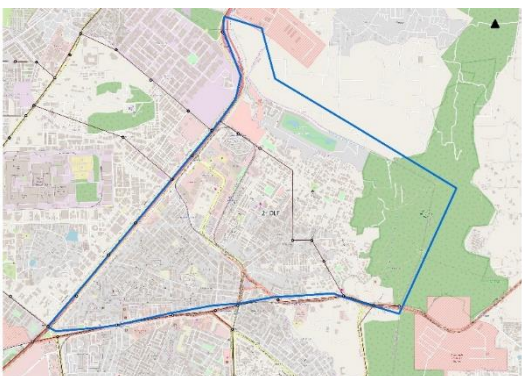
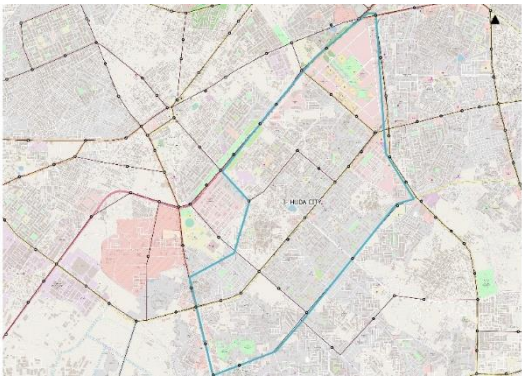
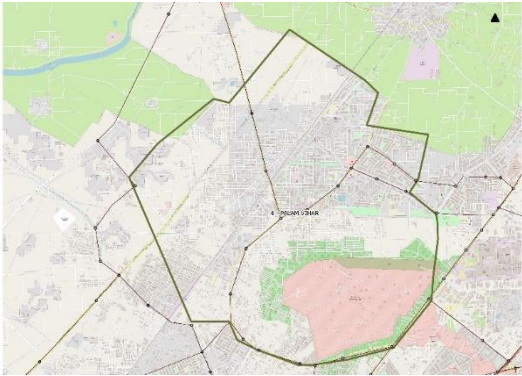


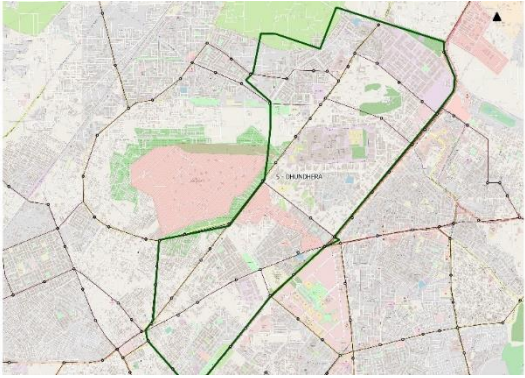
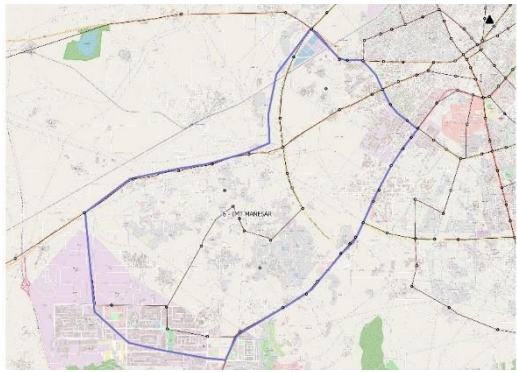
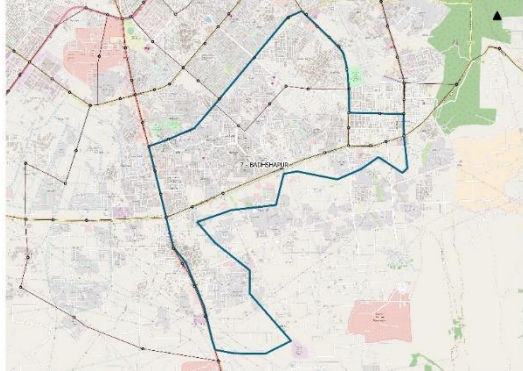
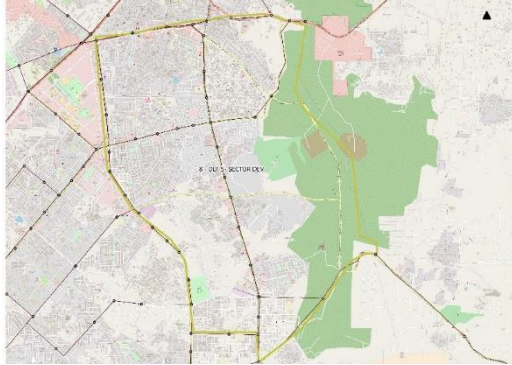
Figure 8-1: Zoning for bus route numbering

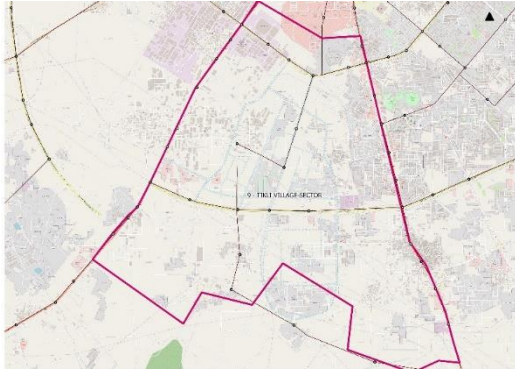
The number allotted to the zone would designate any bus starting and ending from respected zone. Thus, each zone has given one unique number/ID. The numbers were given in such a way that everyone can identify the bus route alignment based on its number. For the external area/ villages were coded with alphabets based on their respective starting alphabet. In the below sections, bus numbering has been explained briefly with demonstration of city and external/ village connecting routes. The below table shows the importance of each zone and pre-dominant areas with their land uses

Table 8-2 : zones and its importance

zones	
	<ul style="list-style-type: none"> • Zone number 0 is the Gamthal (old city) where the city immersed. • Currently Gurugram bus station located in this zone. • 5 trunk lines are start/End from this zones • 4 Via routes are passing through this zone

	<ul style="list-style-type: none"> • Zone number 6 predominant area is railway station zone. • 2 routes are origin in this zone and • 3 Via routes are passing through this area.
	<ul style="list-style-type: none"> • Zone number 1 predominant area is cyber hub and office areas. • 3 Via routes are passing through this area. • These three routes provides easy movement between east to west direction and north to south direction
	<ul style="list-style-type: none"> • Zone number 5 predominant area is Huda city center • 3 routes are origin in this zone and • 4 Via routes are passing through this area.
	<ul style="list-style-type: none"> • Zone number 4 predominant area is Palam Vihar • 4 routes are origin/destination in this zone

	<ul style="list-style-type: none"> • Zone number 2 predominant area is Palam Vihar • 2 routes are origin/destination in this zone • 2 Via routes are passing through this area.
	<ul style="list-style-type: none"> • Zone number 8 predominant area is IMT Manesar • 2 routes are origin/destination in this zone • 1 Via route is passing through this area.
	<ul style="list-style-type: none"> • Zone number 7 predominant area is Badshahpur and residential sectors • 2 routes are origin/destination in this zone • 2 Via routes are passing through this area.
	<ul style="list-style-type: none"> • Zone number 3 predominant area is DLF Phase 5 and residential sectors • 2 routes are origin/destination in this zone • 1 Via route is passing through this area.

	<ul style="list-style-type: none"> • Zone number 9 predominant area is Tatvam Villas and residential sectors • 1 Via route is passing through this area.
---	---

8.3 Bus Numbering

Three digit number approach has been adopted for Gurugram city bus services, the start digit represents the origin zone, middle digit represents the via/passing through zone and the end digit represents the destination of a particular route.



For example route numbering for the route start from Sikanderpur and ends at sector 75A

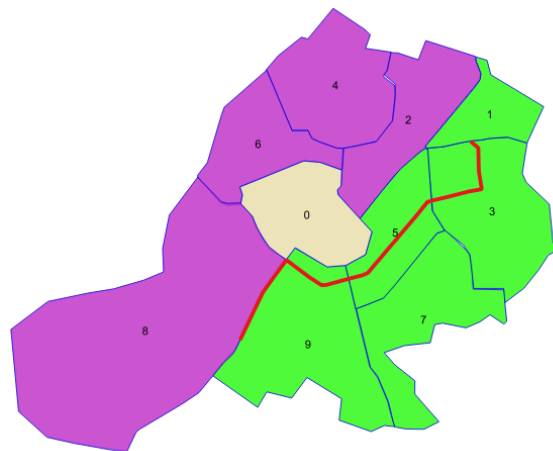
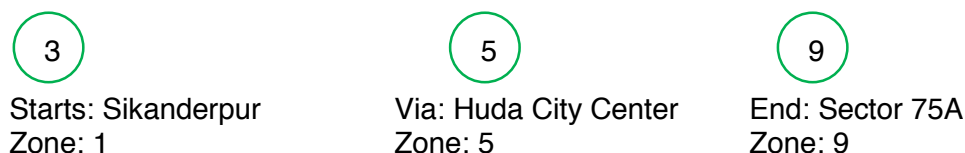
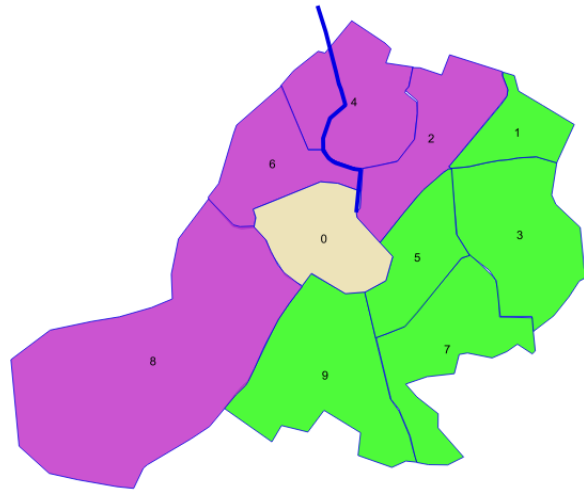


Figure 8-2: Route numbering demonstration with an example route (East to East travel pattern)



Route number for Sikanderpur to Sector 75A is 359

Demonstration of route numbering for route which is starting and ending with in the west direction of NH -8



4

Starts: Palam Vihar
Zone: 4

6

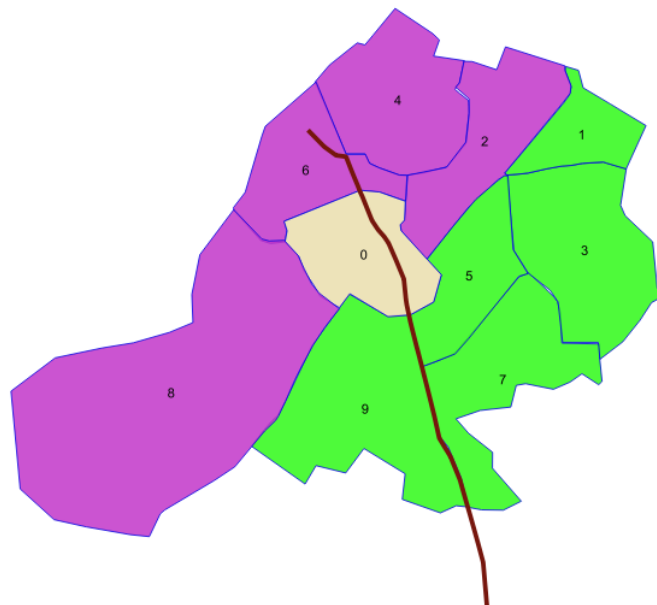
Via: Railway station
Zone: 6

0

End: Gurugram Bus stand
Zone: 0

Route number for Palam vihar to Gurugram is 460

Demonstration of route numbering which is passing through the west to east direction of travel



9

Starts: Tatvam Villas
Zone: 9

0

Via: Gurugram Bus stand
Zone: 0

6

End: Railway station
Zone: 6

S

Starts: Shona Village

Route number for Sohna to Railway station is 906

The table below shows the bus route wise numbering, length of the route and average bus stop spacing in that particular route.

Table 8-3: Bus Route Numbering for Gurugram

Sr. No	Name	Bus numbering
1	Gurugram Bus Stand to Ansal University	073
2	Gurugram Bus Stand to Bilaspur kalan	08B
3	Gurugram Bus Stand to DhaulKuan	051
4	Gurugram Bus Stand to Farrukh nagar	06F
5	Gurugram Bus Stand to Heli Mandi	08H
6	Palam Vihar to Gurugram Bus Stand	460
7	Manesar to Railway station	608
8	Sohna to Railway station	906S
9	Basai Chowk to Huda CC	605
10	Huda city center to Dharampur	506
11	Huda to Maruti Kunj	357
12	Sikanderpur to Sector 75A	359
13	Sector 88A to Palam Vihar	864
14	Sector 97 to Badshahpur	897
15	Sector 2 to Ghata Village	314
16	Sec 2 to Sec 6A	421
17	Sec 56 to Dundahera	372
18	Sector 75 to KIIT College of Engg	09K
19	IFFCO Chowk to Badshahpur	137
20	IFFCO Chowk to Palam Vihar	24P
21	Harsaru to Dundahera	02D
22	GBS to Anand Vihar	021
23	Sec 61 to Green Filed	73G
24	GBS to Karol Bagh	051K
25	Huda city center loop	562+

8.4 Hierarchical Route Based Bus Numbering System

Hierarchical based bus route numbering is created by assigning each hierarchy of route category with range of numbers. For Gurugram proposed bus route system five types of routes are proposed as below:

1. Trunk Routes: High demand high frequency routes connecting major city nodes and running on main roads
2. Primary Routes: Medium Demand medium frequency routes
3. Secondary Routes: Low Demand and lower frequency routes

4. Regional Routes: routes connecting areas outside GMDA
5. Feeder Routes: Feeder routes connecting residential areas

These hierarchical route structure can be allocated following numbers as given below.

Table 8-4: Route Hierarchy Based Numbering System

Route hierarchy	Route Number Range	Remarks
Trunk Route	100 to 199	Route Numbers are initiated from 100 so that they don't mix with sector numbers of city
Primary Routes	200 to 299	
Secondary Routes	300 to 399	
Regional Routes	400 to 499	
Feeder Routes	500 to 599	

8.5 Activity Hub based Bus Route Numbering

This is another bus route numbering concept in which all major activity hubs of city are given special codes and all bus routes originating/ destined to these destinations will start from that special code. For example, all bus routes originating or destined at Railway Station will be given code RS followed by code for route. The proposed bus route numbering concept is as follows:

- First Alphabet of Route Number will represent first letter of name of origin point/activity hub.
- Route number range will be representing group of routes originated from particular hub

This is shown in table below

Table 8-5: Activity Hub Based Numbering System

Activity Node of Gurugram	Route Number range	Remarks
Bus Stand	B – 100 to 199	First alphabet represents name of activity hub and then range of routes connected to hub
Railway Station	R - 200 to 299	
HUDA city centre	H – 300 to 399	
Dundahera	D – 400 to 499	
IFFCO Chowk	I – 500 - 599	

Above three bus route numbering system could be discussed and one can be selected by GMDA.

ANNEXURE 1

Phase 1A Bus stops details with X & Y Coordinates

Annexure 1: Phase 1A bus stop details with X & Y Coordinates

Sr. No	Stop no	Bus Stop Name	Type	x	y
1	1	SEC 34 NAGAR NIGAM	proposed	77.01799	28.430891
2	2	SEC 34 NAGAR 2	proposed	77.0178	28.430815
3	3	MARBLE MARKET SEC- 33/34	proposed	77.020648	28.429115
4	4	MARBLE MARKET SEC- 33/34	proposed	77.019784	28.429446
5	5	CONGNIZANT/ UNITEC RESIDENCY	proposed	77.027848	28.426586
6	6	CONGNIZANT/ UNITEC RESIDENCY	proposed	77.028238	28.426393
7	7	CENTRAL PART 2	proposed	77.031532	28.427473
8	8	CENTRAL PARK 2	proposed	77.030989	28.42708
9	9	GATE 3, SECTOR 38	proposed	77.043076	28.43016
10	10	GATE 3, SECTOR 38	proposed	77.043051	28.429787
11	11	PETROL PUMP , SEC - 47	proposed	77.046586	28.432065
12	12	PETROL PUMP , SEC - 47	proposed	77.046958	28.431995
13	13	BAKH TOWAR CHOWK *	existing	77.05076	28.435976
14	14	UNITECH CYBER CHOWK	proposed	77.055241	28.441025
15	15	UNITECH CYBER CHOWK	proposed	77.0559	28.441272
16	16	PREMIA MEDICARE HOSPITAL	proposed	77.060199	28.446185
17	17	PREMIA MEDICARE HOSPITAL	proposed	77.060377	28.445921
18	18	SECTOR 31 RED LIGHT CROSSING	proposed	77.064828	28.450567
19	19	RADHA KRISHNA MANDIR JHARSA #	existing	77.068036	28.454347
20	20	RADHA KRISHNA MANDIR JHARSA #	existing	77.068447	28.454423
21	21	HUDA CITY CENTRE STOP	proposed	77.072604	28.458172
22	22	NADAR SCHOOL	proposed	77.102136	28.463753
23	23	NADAR SCHOOL	proposed	77.102353	28.463906
24	24	SECTOR 27 JUNCTION	proposed	77.097654	28.463593
25	25	SEC 27 JUNCTION	proposed	77.097432	28.463364
26	26	SECTOR 42 /43	proposed	77.096896	28.458645
27	27	SECTOR 43/45	proposed	77.096485	28.457961
28	28	HORIZON PLAZA PHASE 5	proposed	77.097957	28.452667
29	29	SECTOR 53/54 METRO	proposed	77.100603	28.444957
30	30	VATIKA BUSINESS CENTER	proposed	77.103013	28.439995
31	31	VATIKA BUSINESS CENTER	proposed	77.102487	28.439358
32	32	VATIKA TOWER	proposed	77.103179	28.437461
33	33	SECTOR 55	proposed	77.105094	28.427768
34	34	SAHYOG APARTMENT	proposed	77.105263	28.4263
35	35	SECTOR 56	proposed	77.105072	28.423903
36	36	CLUB FLORENCE	proposed	77.096531	28.417068
37	37	CLUB FLORENCE	proposed	77.095641	28.417383
38	38	RAJESH PILOT GUJAR CHOWK	proposed	77.09097	28.418578
39	39	RAJESH PILOT GUJAR CHOWK	proposed	77.091285	28.418946
40	40	NATIONAL EYE CENTER	proposed	77.091418	28.42009
41	41	SECTOR 56 MOR	proposed	77.091084	28.425865
42	42	SECTOR 56 MOR	proposed	77.091382	28.425889
43	43	BOTANICAL GARDAN	proposed	77.09097	28.432099
44	44	BOTANICAL GARDAN	proposed	77.091096	28.43287
45	45	AVIATION HEIGHTS	proposed	77.09025	28.436445
46	46	AVIATION HEIGHTS	proposed	77.090526	28.436392
47	47	WAZIRABAD DHANI CHOWK	proposed	77.088138	28.439848
48	48	WAZIRABAD DHANI CHOWK	proposed	77.088419	28.439951
49	49	PETROLPUMP SEC 52	proposed	77.084942	28.44226

Sr. No	Stop no	Bus Stop Name	Type	x	y
50	50	PETROLPUMP SEC 52	proposed	77.084694	28.442756
51	51	NEAR JUNCTION	proposed	77.080064	28.446769
52	52	KANHAI COLONY	proposed	77.078528	28.448142
53	53	KANHAI COLONY	proposed	77.078724	28.448304
54	54	GOLD SOOK	proposed	77.076234	28.451285
55	55	GOLD SOOK	proposed	77.076568	28.45139
56	56	FORTIS	proposed	77.07404	28.457873
57	57	POLICE STATION, SEC 29	proposed	77.073697	28.463005
58	58	IFFCO CHOWK METRO STATION	proposed	77.07337	28.465199
59	59	IFFCO CHOWK	proposed	77.070613	28.477631
60	60	IFFCO CHOWK	proposed	77.069642	28.4778
61	61	HERITAGE VILLAGE	proposed	77.074916	28.483994
62	62	GENPACT NH8, FOB	proposed	77.077076	28.486244
63	63	SUKHMANI HOSPITAL #	existing	77.048344	28.433887
64	64	CYBER PARK 2 #	existing	77.057784	28.443611
65	65	CYBER PARK 2 #	existing	77.057985	28.443495
66	66	PREMIA MEDICARE #	existing	77.061447	28.447418
67	67	BLOCK K- SILOKHERA #	existing	77.064531	28.450645
68	68	TAJ CITY CENTRE", #	existing	77.070247	28.45681
69	69	TAJ CITY CENTRE #	existing	77.070422	28.457024
70	70	FORTIS MEMORIAL RESEARCH INSTITUTE #	existing	77.071304	28.45755
71	71	R.D. CITY GATE 1 *, #	existing	77.082064	28.444972
72	72	BAKHTAWAR CHOWK #	existing	77.050678	28.436118
73	73	APPAREL HOUSE SEC 44	proposed	77.074828	28.453249
74	74	METRO PILLOR NO 203	proposed	77.104773	28.434445
75	75	METRO PILLAR NO 203	proposed	77.104543	28.433649
76	76	SEC 53/54	proposed	77.100934	28.445933
77	77	HORIZON PLAZA	proposed	77.099008	28.451727
78	78	HUDA CITY BUS STOP *	existing	77.070579	28.458753
79	79	HUDA CITY BUS STOP	existing	77.070498	28.459083
80	80	KR MANGALAM WORLD SCHOOL #	existing	77.066382	28.461994
81	81	KR MANGALAM WORLD SCHOOL #	existing	77.066797	28.461936
82	82	PLAZZIO HOSPITAL, SEC 29	existing	77.063607	28.464081
83	83	PLAZZIO HOSPITAL, SEC 29	existing	77.063542	28.464437
84	84	GYMKHANA CLUB #	existing	77.06142	28.46579
85	85	GYMKHANA CLUB #	existing	77.061299	28.466164
86	86	HOTEL CROWN PLAZA #	existing	77.059218	28.467473
87	87	HOTEL CROWN PLAZA	existing	77.059491	28.467544
88	88	IFFCO CHOWK	proposed	77.069496	28.47872
89	89	HARYANA VIDYUT PRASARAN NIGAM	proposed	77.103935	28.419245
90	90	HARYANA VIDYUT PRASARAN NIGAM	proposed	77.10351	28.418764
91	91	RAJESH PILOT GUJAR CHOWK	proposed	77.093024	28.417393
92	92	RAJESH PILOT GUJAR CHOWK	proposed	77.092994	28.41713
93	93	VATIKA MOTHER & CHILD HOSPITAL	proposed	77.044879	28.400853
94	94	VATIKA BUS STOP	proposed	77.051823	28.40397
95	95	VATIKA CITY BUS STOP	proposed	77.051074	28.403365
96	96	ST XAVIAR'S HIGH SCHOOL	proposed	77.059458	28.406847
97	97	ST XAVIAR'S HIGH SCHOOL	proposed	77.05959	28.406571
98	98	DPS INTERNATIONAL	proposed	77.063974	28.408566

Sr. No	Stop no	Bus Stop Name	Type	x	y
99	99	DPS INTERNATIONAL	proposed	77.064116	28.408326
100	100	TRADE TOWER	proposed	77.072673	28.411853
101	101	TRADE TOWER	proposed	77.072855	28.411532
102	102	SEC 57 CHOWK	proposed	77.08208	28.414988
103	103	SEC 57 CHOWK	proposed	77.082181	28.414694
104	104	VISION TOWER SEC 62	proposed	77.086293	28.416141
105	105	VISION TOWER SEC 62	proposed	77.086404	28.415883
106	106	RAJESH PILOT GUJAR CHOWK	proposed	77.089563	28.416791
107	107	BADHUSHAPUR MORE	proposed	77.046117	28.401561
108	108	RAJEEV CHOWK	proposed	77.032862	28.447549
109	109	NIIT	proposed	77.015536	28.432572
110	110	PROPOSED	proposed	77.015384	28.432385
111	111	HERO HONDA	proposed	77.011617	28.435083
112	112	HERO HONDA	proposed	77.011505	28.434932
113	113	SHIV MANDIR	proposed	76.944378	28.37022
114	114	SHIV MANDIR	proposed	76.944338	28.370826
115	115	NAKHROLA VILLAGE	proposed	76.955335	28.375708
116	116	NAKHROLA VILLAGE	proposed	76.955011	28.376127
117	117	RAMPURA CHOWK	proposed	76.962006	28.379653
118	118	RAMPURA CHOWK	proposed	76.962239	28.379217
119	119	SIKOH PUR MOR SEC 78	proposed	76.969033	28.382655
120	120	SIKOH PUR MOR SEC 78	proposed	76.970248	28.38417
121	121	GREEN GURUGRAM	proposed	76.973772	28.387644
122	122	GREEN GURUGRAM	proposed	76.974198	28.387199
123	123	TOLL PLAZA STOP	proposed	76.97999	28.393453
124	124	TOLL PLAZA	proposed	76.983696	28.397728
125	125	SHANI MANDIR	proposed	76.988891	28.403091
126	126	SHANI MANDIR	proposed	76.988648	28.403394
127	127	DLF CORPORATE GREENS	proposed	76.99119	28.407126
128	128	DLF CORPORATE GREENS	proposed	76.990957	28.407713
129	129	POST OFFICE NARSINGHPUR	proposed	76.994339	28.412959
130	130	POST OFFICE NARSHINGAPUR	proposed	76.994086	28.413298
131	131	NARSINGHPUR FOB	proposed	76.995432	28.415836
132	132	NARSINGHPUR FOB	proposed	76.996536	28.416905
133	133	SOHNA	proposed	77.000597	28.424858
134	134	SOHNA	proposed	77.000556	28.424145
135	135	KHANDSA VILLAGE FOB	proposed	77.005184	28.429676
136	136	KHANDSA VILLAGE FOB	proposed	77.004121	28.429043
137	137	HITACHI	proposed	77.007776	28.433291
138	138	HITACHI	proposed	77.00809	28.432846
139	139	HERO HONDA CHOWK	proposed	77.009255	28.436577
140	140	HERO HONDA CHWOK	proposed	77.009143	28.436434
141	141	HERO HONDA CHOWK	proposed	77.010703	28.437013
142	142	SECTOR 33, TRANSPORT NAGAR	proposed	77.013842	28.440717
143	143	SECTOR 33, TRANSPORT NAGAR	proposed	77.01448	28.440584
144	144	KHANDSA MANDI	proposed	77.01771	28.444377
145	145	KHANDSA MANDI	proposed	77.016222	28.443424
146	146	NAHARPUR RUPA VILLAGE NH8	proposed	77.0241	28.448428
147	147	NAHARPUR RUPA VILLAGE NH8	proposed	77.023948	28.44792
148	148	RAJEEV CHOWK	proposed	77.031543	28.446344

Sr. No	Stop no	Bus Stop Name	Type	x	y
149	149	RAJEEV CHOWK	proposed	77.036626	28.446095
150	150	JARSHA CHOWK	proposed	77.041173	28.451642
151	151	JARSHA CHOWK	proposed	77.043036	28.45263
152	152	STAR MALL	proposed	77.049851	28.460669
153	153	STAR MALL	proposed	77.050894	28.460839
154	154	SIGNATURE TOWER	proposed	77.056747	28.467391
155	155	SIGNATURE TOWER	proposed	77.056109	28.467675
156	156	TEHREKIA PARK	proposed	77.062053	28.47274
157	157	TEHREKIA PARK	proposed	77.063055	28.472874
158	158	ARITEL	proposed	77.081541	28.491151
159	159	AIRTEL OVER BRIDGE	proposed	77.082022	28.490813
160	160	ASF TOWER	proposed	77.085764	28.495468
161	161	INDUS TOWER LIMITED	proposed	77.086452	28.495325
162	162	IDUS BANK INDIA	proposed	77.088467	28.498324
163	163	INDUS BANK INDIA	proposed	77.089622	28.498761
164	164	SHANKAR CHOWK	proposed	77.091404	28.501626
165	165	SHANKAR CHOWK	proposed	77.092001	28.501377
166	166	AMBIENCE MALL	proposed	77.094675	28.50604
167	167	AMBIENCE MALL	proposed	77.095272	28.506013
168	168	BALAJI COLONY FARUKH NAGAR	proposed	76.835752	28.449975
169	169	CHANDU VILLAGE	proposed	76.922717	28.471972
170	170	DHANKOT VILLAGE	proposed	76.958441	28.472253
171	171	SECTOR 102 DHANKOT	proposed	76.97004	28.468482
172	172	BASAI VILLAGE	proposed	76.984263	28.457671
173	173	SOBHA CITY	proposed	76.99538	28.514562
174	174	GOVT. SCHOOL	proposed	76.995262	28.495797
175	175	KADIPUR CHOWK	proposed	76.998133	28.448793
176	176	VISHWAKARMA COLONY	proposed	76.999106	28.457037
177	177	RAJENDRA PARK MORE	proposed	77.000017	28.49272
178	178	SECTOR 109	proposed	77.002262	28.507339
179	179	SURYA VIHAR	proposed	77.002848	28.476587
180	180	KADIPUR VILLAGE	proposed	77.004829	28.451198
181	181	RAJENDRA PARK	proposed	77.004604	28.488351
182	182	SHIV NAGAR	proposed	77.009974	28.452871
183	183	RAVI NAGAR	proposed	77.004687	28.457111
184	184	MEENAKSHI PUBLIC SCHOOL-	proposed	77.005859	28.438714
185	185	DANLATABAD FLYOVER	proposed	77.011737	28.485216
186	186	SHANTI PARK COLONY	proposed	77.013735	28.454231
187	187	SECTOR 5	proposed	77.014942	28.48011
188	188	CHINTPURNI MANDIR	proposed	77.015926	28.477404
189	189	PATANDI CHOWK	proposed	77.016819	28.456845
190	190	VSR 114	proposed	77.017538	28.537343
191	191	BHIMNAGAR	proposed	77.018534	28.473524
192	192	ASHOK VIHAR PHASE 2 PETROL PUMP	proposed	77.019564	28.490327
193	193	NEW COLONY	proposed	77.019824	28.469636
194	194	SECTOR 5 GOVERNMENT SCHOOL	proposed	77.022272	28.482257
195	195	PARK VIEW RESIDENCY	proposed	77.022815	28.497734
196	196	NEW PALAM VIHAR PHASE 2	proposed	77.024255	28.516785
197	197	BHUTESWAR CHOWK, SHIVAJI NAGAR	proposed	77.023326	28.457341

Sr. No	Stop no	Bus Stop Name	Type	x	y
198	198	SHEETLA MATA MANDIR	proposed	77.027808	28.480091
199	199	POST OFFICE PALAM VIHAR	proposed	77.02644	28.509229
200	200	MIYAN WALI COLONY	proposed	77.027272	28.466971
201	201	KRISHNA CHOWK TEMPLE	proposed	77.028313	28.50155
202	202	SCERT OFFICE	proposed	77.0291	28.455245
203	203	JACOB PURA	proposed	77.029777	28.464198
204	204	SECRETARIET	proposed	77.031043	28.451712
205	205	CIVIL HOSPITAL	proposed	77.032584	28.461492
206	206	ACP OFFICE	proposed	77.03471	28.503427
207	207	GURGAON BUS STATION	proposed	77.033236	28.464847
208	208	SEC 12 CHOWK	proposed	77.033959	28.470093
209	209	RAJEEV NAGAR	proposed	77.03438	28.473646
210	210	CRPF CAMP CHOWK	proposed	77.034782	28.478423
211	211	SECTOR 12 MORE	proposed	77.037564	28.468414
212	212	CARTER PURI VILLAGE	proposed	77.038621	28.506604
213	213	PAREL NAGAR STATE BANK	proposed	77.039618	28.4657
214	214	KRISHNA MANGALAM GARDEN	proposed	77.040671	28.479807
215	215	REZANG LA CHOWK	proposed	77.041026	28.510469
216	216	RAJEEV NAGAR	proposed	77.043473	28.475137
217	217	GOVT. GIRLS COLLAGE	proposed	77.04275	28.467647
218	218	HUDA OFFICE	proposed	77.045251	28.477149
219	219	SUKHRALI ENCLAVE	proposed	77.049928	28.482011
220	220	IMT GURUGRAM	proposed	77.051661	28.506349
221	221	MANAGEMENT DEVELOPMENT INSTITUTION	proposed	77.05623	28.472642
222	222	PASCO CHOWK	proposed	77.055822	28.489261
223	223	TAU DEVILAL PARK	proposed	77.05761	28.502891
224	224	SARHANAL MOR	proposed	77.058507	28.492441
225	225	JAWALA MILL CHOWK	proposed	77.068777	28.504004
226	226	SRI KRISHNA CHOWK	proposed	77.071134	28.506759
227	227	IFFCO CHOWK METRO STATION	proposed	77.072378	28.471467
228	228	DUNDAHERA	proposed	77.074118	28.511017
229	229	OLD GURGRAM ROAD, DUNDAHERA	proposed	77.079369	28.516872
230	230	SECTOR 19 / PHASE 3	proposed	77.080311	28.500071
231	231	MICROMAX MOULSARI AVENUE	proposed	77.095084	28.500312
232	232	PRAJAPAT CHOUPAL	proposed	77.101504	28.488854
233	233	TOTA RAM CHOWK	proposed	77.104093	28.488516
234	234	NEELKANTH HOSPITAL NATTHUPUR	proposed	77.107321	28.483704
235	235	KHUSHBOO CHOWK	proposed	77.108853	28.468489
236	236	SIKANDERPUR	proposed	77.110061	28.479425
237	237	SECTOR 23/ 23A & AMP	proposed	77.045081	28.50891
238	238	MICROMAX MOULSARI AVENUE	proposed	77.095521	28.500323
239	239	SBI , GURUKUL	proposed	77.065619	28.482335
240	240	MARUTI UDYOG GATE 1	proposed	77.062903	28.497353
241	241	HYATT PLACE	proposed	77.065737	28.500351
242	242	NATTHUPUR VILLAGE	proposed	77.105668	28.486238
243	243	W - 11 , PHASE III	proposed	77.099107	28.49788
244	244	CANDOR	proposed	77.073358	28.509777
245	245	SECTOR 37	proposed	77.000194	28.443472
246	246	MAHARANA PRATAP CHOWK	proposed	77.052602	28.472133

Sr. No	Stop no	Bus Stop Name	Type	x	y
247	247	PAYAL CIMEMA	proposed	77.048031	28.480075
248	248	ATUL KATARIA CHOWK	proposed	77.047404	28.481561
249	249	SUKHRALI ENCLAVE	proposed	77.050161	28.482724
250	250	BHIMNAGAR CHOWK	proposed	77.023578	28.46992
251	251	SHEETLA MATA MANDIR	proposed	77.031462	28.478936
252	252	VISHWAKARMA CHOWK	proposed	77.017522	28.474095
253	253	LAXMAN VIHAR / SNEH HOSPITAL	proposed	77.014183	28.481279
254	254	CHANDU VILLAGE DAYAVIHAR	proposed	76.936011	28.472332
255	255	SADHRANA MORH	proposed	76.898718	28.469106
256	256	SULTANPUR VILLAGE	proposed	76.8713	28.4641
257	257	RAM GOPAL COLLEGE OF PHARMACY	proposed	76.864351	28.463842
258	258	FARUKHNAGAR BUS STAND	proposed	76.8267	28.448257
259	259	MR MOTARS	proposed	76.830505	28.448466
260	260	KALIAWAS	proposed	76.888828	28.46758
261	261	BASAI DHANKOT RS	proposed	76.978155	28.463087
262	262	SARAH HOSPITAL	proposed	77.019287	28.456841
263	263	KENDRIYA VIDYALAYA	proposed	77.039813	28.470945
264	264	ITI STAFF COLONY	proposed	77.046304	28.469597
265	265	GURUGRAM RAILWAY STATION	proposed	77.008672	28.485439
266	266	MARUTI WORKSHOP	proposed	77.05964	28.486685
267	267	PATTHAR MARKET	proposed	77.043711	28.480798
268	268	SECTOR 5 CHOWK	proposed	77.020356	28.484457
269	269	SECTOR 112/113	proposed	77.020713	28.528825
270	270	TATA HOUSING GURGAON GATE	proposed	77.019215	28.533249
271	271	MOULSARI ARCADE	proposed	77.103304	28.495605
272	272	DLF PHASE 3	proposed	77.102378	28.49153
273	273	BABUPUR VILLAGE	proposed	76.998847	28.510924
274	274	DAULATABAD	proposed	76.994632	28.50014
275	275	HUDA MARKET SEC 22	proposed	77.063518	28.50277
276	276	HUDA MARKET SEC 22	proposed	77.062829	28.502573
277	287	REZANG LA WAR MEMORIAL 1	proposed	77.043006	28.50979
278	288	REZANG LA WAR MEMORIAL 1	proposed	77.042767	28.509706
279	289	REZANG LA WAR MEMORIAL 2	proposed	77.040698	28.510482
280	290	SECTOR 23 A GATE 2	proposed	77.048039	28.507904
281	291	SECTOR 23 A GATE 2	proposed	77.04774	28.50812
282	292	SECTOR 23 A GATE 3	proposed	77.0456	28.508878
283	293	IMT GURUGRAM	proposed	77.052142	28.50624
284	294	TAU DEVILAL PARK	proposed	77.057389	28.502819
285	295	JAWALA MILL CHOWK	proposed	77.06835	28.503343
286	296	HYATT PLACE	proposed	77.0659	28.500938
287	297	CANDOR	proposed	77.072792	28.508556
288	298	DUNDAHERA	proposed	77.074237	28.510753
289	299	SRI KRISHNA CHOWK	proposed	77.071051	28.506258
290	300	MARUTI UDYOG GATE 2	proposed	77.060394	28.494519
291	301	MARUTI UDYOG GATE 2	proposed	77.060925	28.494734
292	302	CARTERPURI VILLAGE	proposed	77.039026	28.506693
293	303	APC OFFICE	proposed	77.034432	28.503569
294	304	KRISHNA CHOWK TEMPLE	proposed	77.027865	28.501453
295	305	PARK VIEW RESIDENCY	proposed	77.022736	28.497359

Sr. No	Stop no	Bus Stop Name	Type	x	y
296	306	ASHOK VIHAR PHASEIII EXTENSION	proposed	77.020416	28.494617
297	307	ASHOK VIHAR PHASEIII EXTENSION	proposed	77.020484	28.494451
298	308	ASHOK VIHAR PHASE 2 PETROL PUMP	proposed	77.019731	28.490478
299	309	SECTOR 5 CHOWK	proposed	77.020641	28.484419
300	310	SECTOR 5 GOVERNMENT SCHOOL	proposed	77.022589	28.482303
301	311	PARADISE GARDEN	proposed	77.027875	28.479901
302	312	SHEETLA MATA MANDIR	proposed	77.031332	28.479256
303	313	CRPF CAMP CHOWK	proposed	77.034696	28.478559
304	314	KRISHNA MANGALAM GARDEN	proposed	77.040521	28.479855
305	315	PATTHAR MARKET	proposed	77.043422	28.480937
306	316	ATUL KATARIA CHOWK	proposed	77.047207	28.481682
307	317	SARHANAL MOR	proposed	77.058861	28.49252
308	318	PASCO CHOWK	proposed	77.056336	28.489497
309	319	SECTOR 19 / PHASE 3	proposed	77.080357	28.499895
310	320	UDYOG VIHAR PAHSE 4 PARK	proposed	77.082506	28.498322
311	321	UDYOG VIHAR PAHSE 4 PARK	proposed	77.082442	28.498462
312	322	W - 11 , PHASE III	proposed	77.099499	28.497843
313	323	MOULSARI ARCADE	proposed	77.103077	28.495598
314	324	DLF PHASE 3	proposed	77.102375	28.49135
315	325	PRAJAPAT CHOUPAL	proposed	77.101889	28.488621
316	326	TOTA RAM CHOWK	proposed	77.104117	28.488349
317	327	NATTHUPUR VILLAGE	proposed	77.105476	28.486224
318	328	NEELKANTH HOSPITAL NATTHUPUR	proposed	77.107236	28.483488
319	329	ARAVALLI BIO DIVERSITY PARK	proposed	77.110491	28.481945
320	330	KHUSHBOO CHOWK	proposed	77.108804	28.468909
321	331	VSR 114	proposed	77.017788	28.537095
322	332	TATA HOUSING GURGAON GATE	proposed	77.019082	28.532981
323	333	SECTOR 112/ 113	proposed	77.020579	28.528896
324	334	SECTOR 111	proposed	77.022382	28.523289
325	335	SECTOR 111	proposed	77.022226	28.523381
326	336	NEW PALAM VIHAR PHASE 2	proposed	77.023787	28.517716
327	337	POST OFFICE PALAM VIHAR	proposed	77.026272	28.509106
328	338	GOVT SCHOOL	proposed	76.995346	28.495632
329	339	RAJENDRA PARK MORE	proposed	77.000057	28.492542
330	340	HANUMAN MANDIR DAULTABAD	proposed	76.998696	28.493206
331	341	HANUMAN MANDIR DAULTABAD	proposed	76.998611	28.493427
332	342	RAJENDRA PARK	proposed	77.004253	28.488332
333	343	GURUGRAM RAILWAY STATION	proposed	77.00879	28.485545
334	344	CHINTPURNI MANDIR	proposed	77.016255	28.477258
335	345	SECTOR 5	proposed	77.014813	28.479875
336	346	LAXMAN VIHAR / SNEH HOSPITAL	proposed	77.014467	28.481245
337	347	DAULATABAD	proposed	77.011403	28.48503
338	348	APNA ENCLAVE	proposed	77.01318	28.484146
339	349	APNA ENCLAVE	proposed	77.013035	28.4838
340	350	SURYA VIHAR	proposed	77.002598	28.476661
341	351	VISHWAKARMA CHOWK	proposed	77.01772	28.474224
342	352	VISHWAKARMA CHOWK	proposed	77.018478	28.473379
343	353	BHIMNAGAR CHOWK	proposed	77.023512	28.469716
344	354	MIYAN WALI COLONY	proposed	77.027225	28.467271

Sr. No	Stop no	Bus Stop Name	Type	x	y
345	355	JACOB PURA	proposed	77.02988	28.464393
346	356	CIVIL HOSPITAL	proposed	77.032535	28.461186
347	357	BASAI CHOWK	proposed	76.989185	28.457385
348	358	BASAI CHOWK	proposed	76.989059	28.457514
349	359	BASAI VILLAGE	proposed	76.984034	28.457572
350	360	BASAI DHANKOT RS	proposed	76.981291	28.461469
351	361	SECTOR 102 DHANKOT	proposed	76.969985	28.468805
352	362	DHANKOT VILLAGE	proposed	76.957895	28.47225
353	363	CHANDU VILLAGE	proposed	76.922246	28.472086
354	364	BHUDHERA GAON	proposed	76.912171	28.470333
355	365	BHUDHERA GAON	proposed	76.911956	28.470493
356	366	CHDHRANA MORH	proposed	76.899019	28.46898
357	367	FARUKHNAGAR	proposed	76.826517	28.448357
358	368	MR MOTARS	proposed	76.830674	28.448347
359	369	BALAJI COLONY FARUKH NAGAR	proposed	76.835818	28.450146
360	370	RAVI NAGAR	proposed	77.034561	28.473379
361	371	SEC 12 CHOWK	proposed	77.034217	28.470131
362	372	NEW COLONY	proposed	77.019683	28.469458
363	373	BHUTESWAR CHOWK, SHIVAJI NAGAR	proposed	77.023249	28.45718
364	374	SARAH HOSPITAL	proposed	77.019189	28.456984
365	375	PATAUDI CHOWK	proposed	77.016855	28.456992
366	376	RAVI NAGAR	proposed	77.004207	28.456928
367	377	VISHWAKARMA COLONY	proposed	76.999543	28.457205
368	378	IFFCO CHOWK METRO STATION	proposed	77.072822	28.471088
369	379	FAMILY MULTI SPL HOSPITAL	proposed	77.005741	28.438536
370	380	BEST CHILD SPL HOSPITAL	proposed	77.000369	28.443108
371	381	PATAUDI	proposed	76.998298	28.448664
372	382	ENGG MECH	proposed	77.005007	28.451041
373	383	SUKH DEV NAGAR	proposed	77.009351	28.452946
374	384	BHARATI NARSHING HOME	proposed	77.01409	28.454335
375	385	HARYANA AGRICULTURE DEPT	proposed	77.03095	28.451228
376	386	COMMISSIONER OF POLICE	proposed	77.029371	28.455181
377	387	BANL EXCHANGE	proposed	77.036874	28.469211
378	388	GURUGRAM BUS STAND	proposed	77.033573	28.465276
379	389	STATE BANK	proposed	77.039831	28.466113
380	390	GOVT. GIRLS COLLAGE	proposed	77.043497	28.467911
381	391	ITI STAFF COLONY	proposed	77.046747	28.470083
382	392	SUBASH CHANDRA PARK	proposed	77.052094	28.472273
383	393	MANAGEMENT DEVELOPMENT INSTITUTION	proposed	77.056306	28.472166
384	394	SECTOR 40 /BLOCK P	proposed	77.062819	28.450761
385	395	POCKET N	proposed	77.060245	28.45249
386	396	POCKET N	proposed	77.06024	28.4527
387	397	MINI HUDA MARKET SEC 31	proposed	77.056375	28.454914
388	398	MINI HUDA MARKET SEC 31	proposed	77.057209	28.454915
389	399	SRI KRISHNA MANDIR JHARSA	proposed	77.055141	28.453699
390	400	DAINIK BAZAAR	proposed	77.04821	28.446861
391	401	SAINI PURA	proposed	77.047051	28.446855
392	402	ORBIT HOSPITAL	proposed	77.044654	28.449276
393	403	SECTOR 15 PART 1	proposed	77.040377	28.453593

Sr. No	Stop no	Bus Stop Name	Type	x	y
394	404	SECTOR 15 PART 1	proposed	77.040403	28.453365
395	405	OFFICERS COLONY	proposed	77.036329	28.457074
396	406	OFFICERS COLONY	proposed	77.036053	28.45763
397	407	GURUDWARA CHOWK/ AGGRAWAL DHARAMSALA CHOWK	proposed	77.031012	28.459235
398	408	GURUDWARA CHOWK	proposed	77.030846	28.459429
399	409	JAIN LAND COMPLEX SOHNA CHOWK	proposed	77.027068	28.458424
400	410	JAIN LAND COMPLEX SOHNA CHOWK	proposed	77.027132	28.458615
401	411	KABIR BHAVAN CHOWK	proposed	77.022726	28.46317
402	412	KABIR BHAVAN CHOWK	proposed	77.022978	28.463192
403	413	SHREE PREM MANDIR	proposed	77.021117	28.466313
404	414	MG MALL	proposed	77.018765	28.47135
405	415	VISHWAKARMA CHOWK	proposed	77.016822	28.473104
406	416	SHIRPIRI	proposed	77.013891	28.472016
407	417	ARYA VIDYA MANDIR SCHOOL	proposed	77.008175	28.46982
408	418	FIROZ GANDHI COLONY 2	proposed	77.003895	28.468425
409	419	SECTOR 9 MOR	proposed	77.001305	28.467511
410	420	SECTOR 9 L BOLCK	proposed	76.995952	28.465655
411	421	VIDYA MEDICAL CENTER	proposed	76.990283	28.462735
412	422	BASAI CHOWK	proposed	76.99038	28.457796
413	423	SECTOR 40 /BLOCK P	proposed	77.062436	28.450808
414	424	BHAWANI ENCLAVE	proposed	76.99112	28.460415
415	425	BASAI CHOWK	proposed	76.99031	28.457981
416	426	SEC 31 GATE 4	proposed	77.053425	28.452022
417	427	HSIIDC APARTMENT SEC 31	proposed	77.05131	28.449683
418	428	BHAWANI ENCLAVE	proposed	76.990911	28.460578
419	429	VIDYA MEDICAL CENTER	proposed	76.990146	28.462686
420	430	SECTOR 9 MOR	proposed	77.000962	28.467472
421	431	SECTOR 9	proposed	76.995444	28.465621
422	432	VISHWAKARMA CHOWK	proposed	77.016922	28.473245
423	433	SHIRPIRI	proposed	77.013714	28.472019
424	434	SHREE PREM MANDIR	proposed	77.021263	28.466527
425	435	MG MALL	proposed	77.019071	28.471294
426	436	SEC 31 GATE 4	proposed	77.0534	28.451745
427	437	HSIIDC APARTMENT SEC 31	proposed	77.051572	28.449814
428	438	SECTOR 31A	proposed	77.054923	28.453659
429	439	SARASWATI ENCLAVE	Proposed	76.998436	28.446391
430	440	SARASWATI ENCLAVE	Proposed	76.99837	28.446365
431	441	SECTOR 3A	Proposed	77.013598	28.480445
432	442	SECTOR 5 MARKET	Proposed	77.015939	28.481144
Note: 1	*	<i>It is proposed to repair these bus stop (or) construction of new structure for making them functional</i>			
2	**	<i>Need to be removed/relocated; as these bus stops are placed near to the existing BQS and creating confusion</i>			
3	#	<i>Proposed Name for the existing bus stop which are not having any name at present.</i>			