JAIPUR DEVELOPMENT AUTHORITY

COMPREHENSIVE MOBILITY PLAN FOR JAIPUR CITY



DRAFT CMP REPORT

FEBRUARY 2026

RITES
THE INFRASTRUCTURE PEOPLE

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EXECUTIVE SUMMARY

0. EXECUTIVE SUMMARY

0.1. INTRODUCTION

Jaipur, the capital of Rajasthan state, is a heritage city and one of the major tourist destinations in the country. It is situated on the Northwest part of India and is referred as the Pink City. Besides being one of the metropolitan cities in the country, it is a renowned centre of education, trade, commerce, and industry. The study area for the current assignment is Jaipur Region (with an area of about 2,940 sq. km.), which comprises of Jaipur Municipal Corporation (JMC) with an area of 467 sq. km. and 15 satellite towns such as Chomu, Bagru, Bassi etc. along with 725 revenue villages. The study area is shown in **Figure 0.1.**

Over the last decade the city's population has experienced a compound annual growth rate (CAGR) of 2.83% per annum. In addition to being the commercial capital of Rajasthan, Jaipur is also one of the most sought-after tourist destinations in the world with about 70,000-80,000 tourists visiting the city every day during the tourist season. Also, the city has been experiencing explosive growth in the number of registered vehicles. According to 2011 census of India, study area had a population of 40,50,087 out of which 34% are workers. The total tourist arrivals in Jaipur in the year 2024 is about 99.05 Lakh out of which 92.84 Lakh are domestic tourists and 6.21 Lakh are foreign tourists.

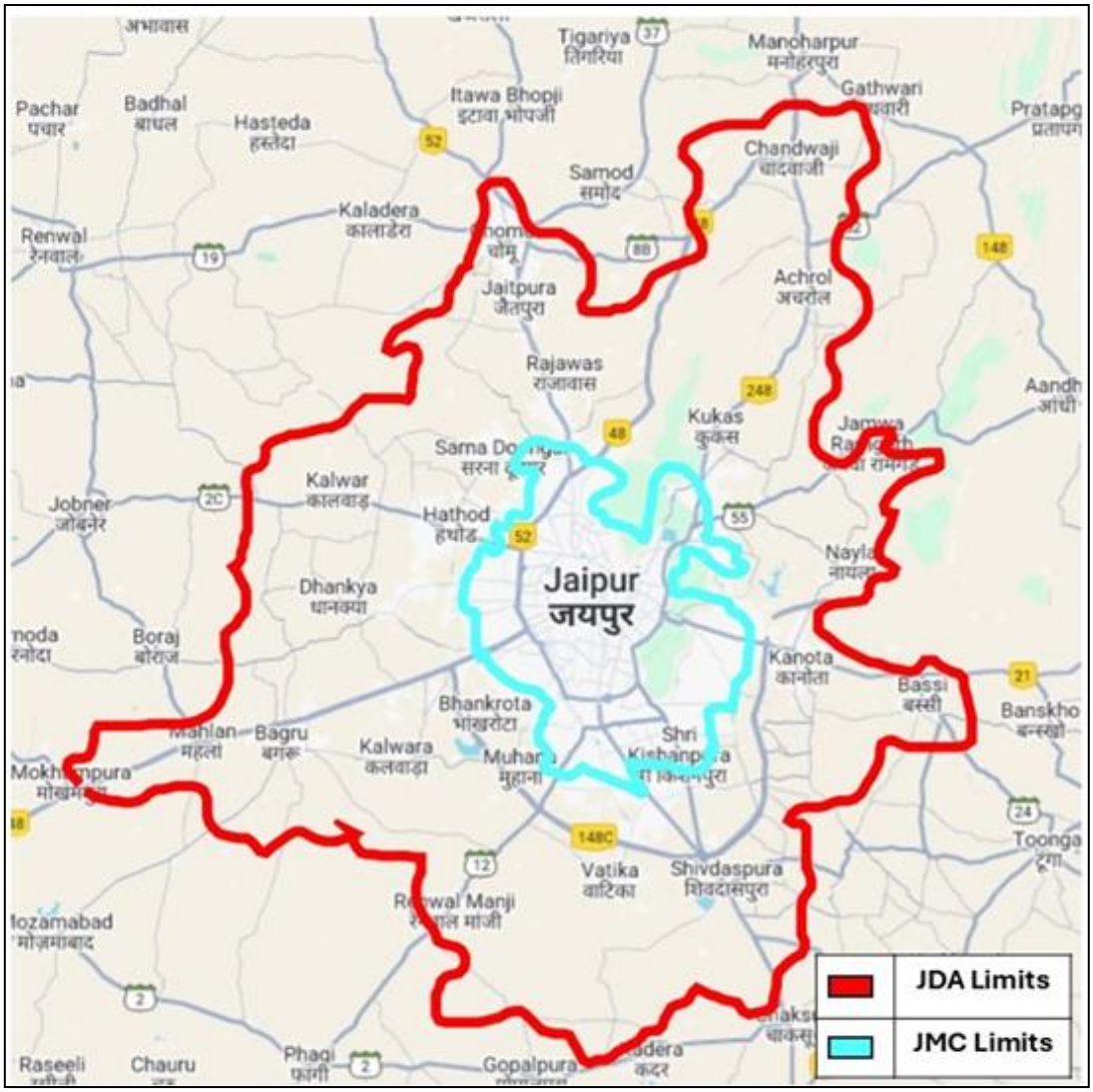
As per Ministry of Housing & Urban Affairs (MoHUA) Guidelines – 2017, Comprehensive Mobility Plan shall be revised and prepared at least once in every five years to address the constantly changing scenarios of mobility in the city. With a view to developing an effective and efficient urban transport system, Jaipur Development Authority has decided to undertake a comprehensive mobility study in Jaipur. For this purpose, RITES Ltd. has been engaged to prepare Comprehensive Mobility Plan for Jaipur.

0.1.1. VISION AND OBJECTIVES OF MOBILITY PLAN

The vision of the CMP is to achieve safe, efficient, reliable and seamless mobility in Jaipur and to make it a model city. The main objectives have been outlined as under:

- Develop strategies and policies for sustainable transport system at the state and city levels.
- Encourage city bus services in key urban areas of the state.
- Introduce eco-friendly mobility solutions by incorporating electric buses.

FIGURE 0.1: STUDY AREA



- Provide guidance and technical support to City Transport Special Purpose Vehicles (SPVs) for implementing city bus services.
- Plan and execute necessary infrastructure, such as city bus terminals, bus depots, and charging stations.
- Understand the socio-economic background and travel patterns
- Develop and use an Urban Transport Planning (UTP) model with advanced techniques and CUBE/VISUM software.
- Evaluate the current strategy, explore consequences of alternative transportation approaches, and recommend/update short, medium, and long-term transportation strategies based on cost-benefit analysis.
- Aligning with National Urban Transport Policy goals, prioritizing efficient public transport and non-motorized modes to discourage individual private vehicle growth.

- Ensure the implementation of the most suitable, sustainable, and cost-effective urban transport program with a regional perspective.
- Integrate transport and parking policies into urban planning strategies.
- Propose a phased investment plan and policy recommendations for all transportation modes, integrating mass transit and public transport with Intermediate Public Transport (IPT).
- Recommend institutional mechanisms for inter-agency coordination.
- Strengthen transport planning skills and share acquired data, planning models/tools, and knowledge. Develop a summarized action plan for improvement

0.2. REVIEW OF CITY PROFILE

0.2.1. Existing Transport System

The city is located on NH-48 (Old NH-8), a part of the Golden Quadrilateral linking Delhi, Mumbai, Chennai, and Kolkata. It is also traversed by NH-52 (Old NH-12) and NH-21 (Old NH-11), providing north–south and east–west links. At the state level, Jaipur is connected through important State Highways such as SH-2C, SH-12, SH-55, SH-19, SH-37, SH-24, and SH-52. Satellite towns and growth centres such as Bassi, Vatika, Shivdaspura, Bagru, Kukas, Achrol, Kanota, Jahota, Jamwa Ramgarh, Kalwar, and Bagwara are connected through national and state highways, ensuring seamless peri-urban integration.

In rail connectivity, Jaipur serves as the headquarters of the North-Western Railway Zone. Jaipur Junction is the busiest station in Rajasthan, with four main routes towards Delhi, Ajmer, Sawai Madhopur, and Sikar. Suburban connectivity is supported by several smaller stations: Kanakpura, Bindayaka, Dhankya (towards Ajmer); Dher Ka Balaji, Nindar, Chomu (towards Sikar); Gandhi Nagar, Jagatpura, Bassi (towards Delhi); and Durgapura, Sanganer, Shivdaspura (towards Sawai Madhopur).

By air, Jaipur is connected domestically to Delhi, Mumbai, Bengaluru, Chennai, Kolkata and internationally to major global cities. The Jaipur International Airport at Sanganer, located 13 km from city centre, has two passenger terminals and a cargo terminal, handling 5.46 million passengers in 2024–25.

Jaipur Metro is operated by Jaipur Metro Rail Corporation Limited (JMRCL) which came into service in May 2015 between Mansarovar and Chandpole (Phase IA). At present, Phase 1 (A+B) from Mansarovar to Badi Chaupar is operational.

Bus transport is a backbone of urban and regional mobility. JCTSL operates city buses, while RSRTC runs intercity and interstate buses connecting Jaipur with Delhi, Agra, Ajmer, Udaipur, Jodhpur, Kota, Bikaner, and Chandigarh. Key bus terminals include Sindhi Camp, Narayan Singh Circle, and Vaishali Nagar, supported by numerous private

operators. Services range from ordinary to deluxe and Volvo, providing reliable and affordable travel.

In addition to the public bus system operated by JCTSL, Jaipur's public transport ecosystem includes a network of privately-operated minibuses, which play a critical role in serving underserved and peripheral areas of the city. These minibuses are managed entirely by private operators and function as supplementary modes to the formal public transit system. Para-transit modes such as shared autos and tempos form a vital layer of Jaipur's public transportation framework, especially for last-mile connectivity and short-distance travel within dense residential, market, and institutional areas. These services are typically privately operated, unregulated or semi-regulated, and operate along informal yet consistent corridors.

0.2.2. Registered Motor Vehicles

The city has been experiencing an explosive growth in number of registered vehicles from 2020-21 to 2024-25. The mode wise registered vehicles in the city from years 2020-21 to 2024-25 is given in **TABLE 0.1**.

TABLE 0.1: REGISTERED VEHICLES IN JAIPUR

S. NO.	MODES	NO. OF REGISTERED VEHICLES (YEAR WISE)					
		2020 - 21	2021-22	2022 - 23	2023 - 24	2024 - 25	2025 -26 (Till Nov '25)
1	2-W	20,79,028	21,55,777	22,95,135	24,09,046	25,91,495	26,92,163
2	E-Rickshaw	19,477	21,561	29,236	30,559	32,440	33,037
3	E-Cart	1,524	1,915	3,034	3,129	3,322	3,383
4	3-W (Passenger)	28,856	29,137	31,976	31,470	33,407	34,021
5	3-W (Load)	5,386	5,664	6,207	6,115	6,491	6,611
6	Motor Cab/ Maxi Cab	28,920	29,324	31,661	36,160	41,764	45,506
7	Motor Car	5,44,983	5,76,341	6,22,653	6,69,191	7,31,438	7,68,683
8	Bus	10,736	11,194	11,491	11,336	11,404	11,404
9	Ambulance	2,479	2,585	2,876	3,031	3,218	3,266
10	School Bus	2,521	2,629	2,807	2,958	3,140	3,188
11	Tractor	45,430	47,432	50,365	53,540	56,877	60,083
12	Dumper/Trailer	13,238	13,806	15,061	15,874	16,851	16,851
13	Goods Carrier	72,788	76,316	84,347	88,899	94,372	96,259
14	Earth Moving Vehicles	4,646	4,845	5,245	5,528	5,951	6,108
15	Others	897	1,193	1,486	6,180	6,274	6,399
Total Vehicles		**28,60,907**	**29,79,719**	**31,93,579**	**33,73,017**	**36,38,444**	**37,86,961**
Growth Rate (%)			**4.15%**	**7.18%**	**5.62%**	**6.46%**	**4.04%**

Source: RTO Jaipur

0.2.3. Traffic Safety

Traffic safety refers to the methods and measures used to prevent road users from being killed or seriously injured. Typical road users include pedestrians, cyclists, motorists, vehicle passengers and passengers of on-road public transport (mainly buses and autos). The accident statistics in Jaipur from 2019 to 2022 is given in **TABLE 0.2.**

TABLE 0.2: ACCIDENT STATISTICS IN JAIPUR

Year	Total Accidents	Fatalities	Injuries
2019	4271	1283	3581
2020	1940	606	1568
2021	2165	625	1791
2022	2687	765	2167

Source: MoRTH

0.2.4. Review of Existing Land Use Pattern

The land use allocations proposed in Master Plan 2025 is presented in **TABLE 0.3.** The land use in U1 urban area region is primarily agricultural (38.5%) followed by residential area (23.9%) both of which are spread all over the study area. Forest area covers about 9.3% and open spaces cover about 16.65%. Circulation accounts for 1.5% only.

Commercial activities (2.5%) are mainly concentrated in Walled City and along MI road. Industrial area (2.7%) is not concentrated in any particular point and is observed in the north and south of the city.

TABLE 0.3 LAND USE DISTRIBUTION – MASTER PLAN 2025

S. No.	Land use	Area (ha)	% of Total Area
1	Residential	19,072	23.9
2	Commercial/ Mixed	1,978	2.5
3	Industrial	2,119	2.7
4	Public & Semi-public	2,029	2.5
5	Army	1,103	1.4
6	Parks	543	0.7
7	Circulation	1,196	1.5
8	Agricultural	30,708	38.5
9	Water bodies	322	0.4
10	Forest	7,445	9.3
11	Open Space	13,285	16.6
12	**Total Area**	**79,800**	**100%**

0.2.5. Traffic and Travel Surveys

a. Road Network and Speed & Delay

- The majority of the road network (24.8%) has a Right of Way (RoW) of 20–30 m, followed by 21% with 40–50 m RoW. Only 1.2% of roads have RoW below 10 m, while about 9.8% have RoW above 60 m. This shows majority of roads fall in the medium RoW category, indicating limited space for future widening in core areas, while very wide corridors are relatively few
- In terms of carriageway width, six-lane (35.3%) and eight-lane (29.5%) roads dominate. Four-lane roads account for 25%, while only 1.8% are intermediate lanes (<6 m).
- About 85.2% of the surveyed road network has divided carriageways, reflecting a relatively higher standard of road design.
- Pedestrian infrastructure is uneven: 51.5% of roads have footpaths on both sides, while 27.8% lack footpaths altogether.
- Speed survey findings indicate significant congestion: 25.5% of the network records journey speeds <20 km/h during peak hours (54% higher than off-peak). About 32% operates at 20–30 km/h, while only 26.6% achieve 30–40 km/h during peak periods.
- Traffic congestion is the major contributor to delays (55.6% peak, 51.5% off-peak), while traffic signals also cause notable delays (41–45%).
- Overall, survey findings highlight significant peak-hour congestion, particularly in core city areas, inadequate pedestrian facilities, and uneven distribution of RoW and carriageway capacity.

b. Traffic Characteristics at Intersections, Mid Blocks & Screen lines

- Collectorate Circle, with 2.8 lakh PCUs daily, stands out as the busiest junction in the city. It is closely followed by Ajmer Road (1.56 lakh PCUs), Chomu Pulia (1.20 lakh PCUs), Apex Circle (1.18 lakh PCUs), Hawa Sadak (1.17 lakh PCUs), and OTS Circle (1.11 lakh PCUs).
- Mansarovar Metro (11.85%), Govt. Hostel Chauraha (11.74%), Riddhi Siddhi Circle (11.45%), and New Gate (11.37%) register the highest peak-hour shares, reflecting intense rush-hour stress and highlighting the need for targeted traffic management during critical periods.
- While central hubs like Collectorate Circle carry the city's heaviest daily loads, smaller intersections with high peak-hour shares emerge as critical bottlenecks, warranting targeted congestion management during rush hours.

- Highest Daily Traffic is observed on Jaipur–Sikar Road (69,819 veh.; 65,490 PCUs), making it the busiest mid-block section, followed by Gokulpura–Kalwar Road (66,761 veh.; 53,426 PCUs) and the Jaipur–Jodhpur Highway (52,508 veh.; 94,705 PCUs), all of which serve as critical high-volume corridors.
- Critical congestion spots are evident at mid-blocks such as Jaipur–Sikar Road, Gokulpura–Kalwar Road, and Alwar–Jaipur Road, where high daily volumes combine with strong peak-hour shares, marking them as priority corridors for targeted congestion management measures.
- Heaviest corridors are observed along Tonk Road (1.22 lakh vehicles; 99,190 PCUs) and Jaipur–Ajmer Road (1.20 lakh vehicles; 91,685 PCUs), reaffirming their role as the city's primary arterial spines carrying the bulk of daily traffic.
- Peak-sensitive corridors include the Sitapura Railway Crossing, which records the highest morning peak share (12.2%) along with significant evening congestion (9.5%), making it a major choke point. Jagatpura Road also experiences notable pressure, with 9.5% in the morning and 8.0% in the evening, highlighting sustained peak-hour stress.

c. Traffic Characteristics at Outer Cordons

- The outer cordon survey shows Chomu (NH-52 Sikar Road) as the busiest corridor with 74,149 vehicles (1.10 lakh PCUs), followed by Chainpura (Agra Road) at 62,330 vehicles (70,566 PCUs) and Mokhampura (Ajmer Road) at 55,632 vehicles (1.08 lakh PCUs), marking them as Jaipur's key regional gateways needing priority focus
- Peak-hour analysis indicates that while city locations like Jagatpura (Sitapura) record peak shares of nearly 12%, the outer cordon shows the highest concentration at Nayabans (9.3% morning, 9.1% evening) and Achrol (7.9% morning, 9.2% evening). In contrast, high-volume corridors such as Chainpura and Mokhampura exhibit more balanced peak-hour shares of 5–7%, reflecting a relatively even distribution of traffic demand across the day.
- Chomu (NH-52) and Chainpura (NH-21 Agra Road) function as major radial feeders and require capacity augmentation to sustain growing demand. Nawalpura (NH-48 Delhi Road) emerges as a commuter-heavy corridor with pronounced directional saturation, necessitating priority intervention. Meanwhile, smaller connectors such as Achrol, Nayabans, and Kathawal, though carrying lower overall volumes, exhibit high peak-hour shares, signaling localized congestion pressures during specific time windows.

d. Terminal Characteristics

- Sindhi Camp Bus terminal is handling total daily passengers of about 54,000 with boarding passengers of 37,778 and alighting passengers of 16,393. The analysis of travel time data at Sindhi Camp shows that around 38% of passengers reach the

bus terminal within 30 minutes, while a majority—56.38%—require 30 to 60 minutes.

- The daily passengers in Jaipur Junction is 1,18,181 which is almost 350% more than the passenger movement in Gandhi Nagar Railway station i.e. 33,687. The analysis of travel time data at Railway Stations shows that approximately 39.41% of passengers have a travel time of up to 30 minutes to reach railway station. About 50.91% of passengers have a travel time ranging from 30 to 60 minutes, while 9.68% experience travel times exceeding 60 minutes.
- Cumulative for all the terminals, work and business purpose trips contribute more than one-third of the share of total trips to Jaipur city. Majority of passengers (more than 50%) use private vehicles/taxi to reach bus/rail/air terminals followed by autos.
- At metro stations, the daily passenger boarding and alighting occurs at Badi Chaupar Metro Station, with 13,621 passengers, followed by 13,511 passengers at New Aatish Metro Station. The distribution of passengers by trip purpose indicate that the majority of trips are for work-related purposes, accounting for 40.26%. Business-related trips make up to 18.54% of the total trips and educational trips represent approximately 16.22%.

e. Public Transport & IPT Characteristics

- It is observed that the IPT stop at Sindhi Camp caters to the highest number of passengers, with 4,645 boarding and 4,716 alighting passengers daily followed by Jaipur station with total daily boarding alighting passengers of 7813.
- The distribution of passengers by travel time indicates that 54.5% of passengers have a travel time of more than 60 minutes, while 30.8% have travel times ranging between 30 and 60 minutes.
- The survey revealed that 56% of total passengers are daily travelers and the majority of trips are performed for work (34.6%) and business (30.6%) purposes.
- The present PT system is unable to cater to the need of public, hence resulting into high reliance on private modes thus leading to chaos and congestion.

f. Tourist Survey

- A majority of visitors (63.2%) prefer 3-day stays, followed by 2–4 days as the typical travel span, while one-day or extended visits are uncommon.
- Taxis (58.1%) and auto-rickshaws (21.8%) dominate tourist mobility, with limited use of metro (5.7%) and public buses (0.8%), showing a strong tilt toward flexible, hired modes.

- Most tourists spend ₹1000–3000 daily, with moderate expenses being the norm, while very high or very low spending groups are relatively small.
- Tourist feedback highlights strong satisfaction with safety, transport availability, and parking, while walking, public conveyance, and cleanliness are largely rated average, signaling areas for improvement. Pollution and congestion emerge as the weakest aspects, underscoring critical challenges to urban mobility and overall tourist experience.

g. Household Survey Analysis

- The average household size in the study area is 3.65 persons per household.
- Approximately 36.79% of individuals are engaged in occupations such as government service, private sector jobs, and business activities.
- Average monthly household income in the study area is about Rs. 29,770.
- Most households rely on two-wheelers, with 71.6% owning one, while car ownership remains limited as over 60% do not own a car. Multiple vehicle ownership is rare, highlighting a strong dependence on two-wheelers for daily mobility.
- The total daily trips in the study area are about 83,51,561 with PCTR of 1.50 including walk and 1.19 excluding walk. Work & business purpose trips contribute 47% share in total trips while education trips also have high share of 32%.
- The analysis shows that the overall average trip length including walking trips is 6.67 km, while excluding walking trips it increases to 8.26 km, indicating the significant impact of short-distance walking trips on the city's mobility profile.

0.2.6. Service Level Benchmarking

To facilitate comparison between cities and changes in performance over time, it is important that the performance levels are monitored against set benchmarks. Typically, four Level of Service (LOS) viz. 1, 2, 3, and 4 have been specified, with 1 being highest LOS and 4 being lowest to measure each identified performance benchmark. Therefore, the goal is to attain service level 1. SLBs have been identified for the following parameters:

- **Public transport facilities**: Average LOS of 2.3 suggesting that the City has public transport system which may need considerable improvements in terms of supply of buses/ coaches and coverage as many parts of the city are not served by it.
- **Pedestrian infrastructure facilities:** Average LOS is 3, indicating that the city has pedestrian facilities which may need considerable improvements
- **Non-Motorized Transport (NMT) facilities**: Average LOS is 4 indicating that the city

lacks adequate NMT facilities.

- **Level of usage of Intelligent Transport System (I.TS) facilities**: Average LOS is 3.2 indicating that the city lacks adequate ITS facilities.
- **Travel speed (Motorized and Mass Transit) along major corridors**: The LOS is 2.5 representing significant approach delays with lower travel speed.
- **Availability of parking spaces**: From the overall LOS of 2.5, it can be concluded that paid parking spaces need to be improved to cater to meet the demand.
- **Road safety**: From the overall LOS of 3.5, it can be concluded that Level of Fatality rate in a city is high.
- **Pollution levels**: From the overall LOS of 2.3, it can be concluded that some improvements are needed in emission standards, checking pollution etc.
- **Integrated land use transport system**: The LOS of integrated land use transport system is 3.1 suggesting that inconsistency in the city structure and public transport system leads to lesser ridership and high dependence on personalized motor vehicles.
- **Financial sustainability of public transport**: The LOS of financial sustainability of public transport by bus is 3 suggesting that the public transport of a city is financially sustainable but needs considerable improvements.

0.3. TRANSPORT DEMAND ASSESSMENT

Some of the major inputs to urban transport demand model developed for Jaipur are:

- Delineation of study area into smaller traffic zones
- Population (existing and proposed at traffic zone level)
- Employment (existing and proposed at traffic zone level)
- Various transport sytems alongwith their capacity, headways and speed etc.
- Intermodal integration facilities available and time required for passengers to interchange from one mode to another including walk time.

Detailed traffic and travel surveys have been carried out as part of the assignment to establish existing transport demand in the study area (Master Plan area). Standard 4 stage Urban Transport Planning System model process has been adopted that consists of:

- Trip Generation and Attraction Sub Models
- Trip Distribution Sub Model
- Modal Split Sub Models
- Assignment Sub Models

i. Landuse Transitions

The Landuse transitions have been taken into account while projecting the future years' population and employment. The Census 2011, Master Plan, Development plan, existing & proposed land-use, and CTTS Jaipur, 2022 have been taken as base for this exercise. The estimation is done for both the base year 2024 and horizon years 2031, 2041, 2051 and 2055. The stakeholders' views on direction of city growth and anticipated population & employment growth across different sectors for various horizon years have been taken into account. A preliminary reconnaissance was also carried out by RITES team to make an assessment of the present level of land use developments in various traffic zones.

ii. Demographic Projection

The population forecast is based on growth trends analyzed separately for the core, middle, outer, and special areas that collectively form the study area, in addition to existing growth patterns from Census data. The outer areas are expected to grow faster than the Municipal Corporation due to urban expansion. Based on the above considerations, future population projections have been extrapolated for the horizon years 2031, 2041, 2051 and 2055, as shown in **TABLE 0.4**.

TABLE 0.4: ESTIMATION OF STUDY AREA POPULATION

Year	Population (lakh)
2024	55.9
2031	66.4
2041	83.1
2051	95.8
2055	101.3

iii. Employment Projection

As per Census 2011, workers constituted 34% of total population within Jaipur. Accordingly, the Work Force Participation Rate (WFPR) of 35% has been considered for estimating total employment in study area for base year 2024 resulting to a total of 19.5 Lakh workers. For the year 2031, WFPR of 36% has been assumed. However, assuming better economic conditions in future years, higher WFPR has been adopted for further horizon years. **TABLE 0.5** shows the growth trend in employment in the study area.

TABLE 0.5: WORK FORCE PARTICIPATION IN STUDY AREA

Year	2024	2031	2041	2051	2055
WFPR	35%	36%	38%	39%	39%
Employment (in Lakh)	19.5	23.9	31.6	37.3	39.5

0.3.1. Development of Base Year Travel Demand Model

The model is based on motorised trip productions / attractions and internal trips of study area residents. These modes of travel (i.e. car, two wheeler, private auto-rickshaws & public transport including bus, minibus and shared auto) comprise about 67 Lakh daily trips. The remaining trips reported in household interview survey (HIS) are those relating to non-mechanised trips (walk, cycle and cycle rickshaw).

Four sub models are developed viz. Generation, Distribution, Modal choice and Assignment models:

- Generation models calculate trips produced and attracted by each zone;
- Distribution models distribute trips generated into the possible destinations and provide matrix of total trips;
- Modal choice models split total trip matrix by mode;
- Assignment models represent the last stage of the model, build paths, assign origin / destination (OD) matrices, and finally provide loaded networks (average hour and peak hour).

0.3.2. Development of Business As Usual (BAU) Scenario, 2055

Considering the above assumptions and calibrated / validated traffic demand model, forecasting of transport demand has been carried out for 'Business as Usual' (BAU) scenario in the year 2055. Overall modal split for various modes in this scenario for the year 2055 is given in **TABLE 0.6**.

The daily CO_2 emissions are projected to rise from current 7,052 Tonne/day to 15,768 Tonne/day in the year 2055 under the Business as Usual scenario. It can be concluded from these results that if we continue on the current path of high motorization and neglecting the role of Walk, NMT and Public Transport based trips in the overall transport scenario of Jaipur, high level of environment degradation will be experienced.

0.3.3. Development of Sustainable Urban Transport Scenarios

Business As Usual (BAU) scenario with decreasing share of public transport, Non-Motorized Transport (NMT) and Walk, will not lead the city towards national goals of sustainable transport and climate change. In order to achieve these goals, Landuse, Public Transport, NMT and Technological Transitions have been considered as strategies for developing various Sustainable Urban Transport (SUT) scenarios. It is expected that adoption of SUT scenario will fulfill the objective of enhancing economic and social development while mitigating CO2 emissions within the City. This will enable the city to handle the mobility challenges while considering the climate change and local environment. The SUT scenarios are based on following principles:

- Urban Structure Scenario: Intensive development along high demand PT corridors.
- Public Transport Scenario: In addition to Scenario 1, augmentation of PT system.
- Non-Motorized Transport Scenario: In addition to Scenario 1 and 2, augmentation of NMT/walk facilities.
- Technology Transition Scenario: in addition to Scenarios 1, 2 and 3, possible shift to alternative fuels through use of highly efficient technologies.

On the basis of above analysis, a comparative picture has been drawn to assess the impact each scenario has on the travel pattern and environment. The **TABLE 0.6** presents comparative pictures for various scenarios.

TABLE 0.6 COMPARATIVE ANALYSIS BETWEEN DIFFERENT SCENARIOS

Scenario		Base Year	BAU	Urban Structure Scenario	Public Transport Scenario	NMT Scenario	Technology Scenario
Horizon Year		**2024**	**2055**	**2055**	**2055**	**2055**	**2055**
Population		**5586179**	**10131463**	**10242936**	**10242936**	**10242936**	**10242936**
Total Trips		8351560	15567705	15879060	15879060	15879060	15879060
PCTR (Total)		1.5	1.5	1.6	1.6	1.6	1.6
PCTR (Motorised)		1.2	1.2	1.2	1.2	1.2	1.2
Modal Share (%)	**Car**	11.4%	12.1%	10.8%	10.5%	10.1%	10.1%
	2W	34.1%	36.9%	36.5%	31.8%	30.8%	30.8%
	Auto Rickshaw	16.4%	15.1%	15.9%	15.6%	15.6%	15.6%
	PT incl. Sh. Auto, E-Rickshaw, Bus, MRTS	15.2%	14.0%	14.7%	18.4%	17.9%	17.9%
	Cycle	2.7%	2.5%	2.5%	4.7%	6.3%	6.3%
	Walk	20.2%	19.4%	19.6%	19.0%	19.3%	19.3%
Trip Length (Km)	**Car**	10.7	11.0	8.5	8.5	8.5	8.5
	2W	8.1	8.5	8.5	6.5	6.5	6.5
	Pvt. Auto	5.3	5.5	5.2	5.0	5.0	5.0
	PT incl. Sh. Auto, E-Rickshaw, Bus, E-Bus/CNG Bus, MRTS	7.1	9.5	10.5	12.5	12.5	12.5
	Cycle	1.6	2.0	2.0	2.1	2.5	2.5
Veh-km Travelled	**Car**	4252179	8637072	6076485	5885275	5688441	5688441
	2W	19305514	40664244	41027625	27332521	26472406	26472406
	Pvt. Auto	2147071	3811550	3861292	3652066	3652066	3652066
	Cycle	336872	718630	733003	1436574	2273192	2273192
Pax-km Travelled	**PT incl. Sh. Auto, E-Rickshaw, Bus, E-Bus/CNG Bus, MRTS**	9062972	20674263	24574662	36519145	35506855	35506855
CO_2 Emissions Per Day ('000 Kg)		**7,052**	**15,768**	**10,945**	**14,915**	**14,499**	**10,764**

It is seen that CO_2 emissions are likely to decrease from 15,768 tons in BAU scenario to 10,945 tons in Urban Structure scenario; other pollutants are also likely to decrease in Urban Structure scenario. Technological scenario has more benefits of reducing CO_2 from 15,768 tons to 10,764 tons compared to Urban Structure and BAU scenario and benefits in reduction of emissions from other pollutants.

0.3.4. Recommended Scenario

The Technology Scenario is the most suitable scenario for the city as it includes the following benefits:

- Development of compact city
- Shorter trip lengths and improved access to public transport
- Reliable, comfortable and safe public transport
- Increase in modal share of walk and NMT
- Considerably lower emissions from all the other scenarios

As such, the Technology Scenario is recommended for the next stage i.e. the Proposal Formulation and Implementation Plan.

0.4. DEVELOPMENT OF COMPREHENSIVE MOBILITY PLAN

0.4.1. Integrated Land Use and Urban Mobility Plan

CMP recommends intensive development along major travel demand corridors. Higher grade of public transport system could be planned along these corridors for facilitating passenger movement. To ensure intensive development along major mobility corridors envisaged under the present Study, it is proposed that the FAR may be increased in line with TOD guidelines for areas falling in 500 m belt of the travel corridor.

0.4.2. Formulation of Public Transport Improvement Plan

a. Proposed Mass Rapid Transit System (MRTS) Corridors

Considering the public transport demand for the horizon period of 30 years, the master plan for Mass Rapid Transit System has been proposed for the next 30 years. The Phase 1 MRTS corridor is already operational. The MRTS corridors have been proposed to be implemented in three phases. The total length of proposed MRTS corridors in all the phases (2,3 & 4) is about 138 Km. A feasibility study considering the capacity, geometric constraints, capital & operating costs, alternative analysis etc. would determine the final alignment and technology of the corridor. The details of proposed MRTS corridors are as follows:

MRTS CORRIDORS	LENGTH (KM)	MAXIMUM PHPDT (2055)
Phase 2: Prahladpura - Todi Mod including Spur from Govt. Hostel to Chandpole (2031)	42.8	24,860
Phase 3A: Transport Nagar – Balaji Mod – Jagatpura (Extension of Phase-1C)	17.0	9,800
Phase 3B: Ajmer Road Chauraha – Kalwar Road (Extension of Phase-1D)	8.5	10,500
Phase 3C: Kanakpura – Civil Lines – Ram Bagh – Jhalana Dungri	16.3	9,150
Phase 3D: ISBT Heerapura - Mansarovar – Balaji Mod	16.0	9,400
Total Phase-3 (2041)	**57.8**	
Phase 4A: Jagatpura Rly Stn – Khatipura Rly. Stn. Spur	6.5	1,550
Phase 4B: Galta Ji – Jal Mahal - Amer	9.5	6,600
Phase 4C: Transport Nagar – Bagrana (Extn of Phase-1C)	10.4	5,380
Phase 4D: Kalwar Road – Laxmi Narayanpura (Extension of Phase-3B)	11.1	7,200
Total Phase-4 (2055)	**37.5**	
Total Metro Network (Phase 2, 3, 4)	**138.1**	

b. Proposed Bus System Plan

In addition to existing bus routes operated by JCTSL, a total of 9 medium-capacity demand corridors has been identified across the entire Study Area on which the normal bus-based PT system is proposed to be operated. They will act as a feeder to proposed MRTS corridors. The standard low-floor AC Buses (preferably E-buses) are proposed to be operated along these corridors. In addition, 15 Feeder Bus Routes have also been identified on low-capacity demand corridors. These routes will act as feeder to existing and proposed MRTS and Bus system. The Midi are proposed to be operated along these corridors. The proposed bus corridors are presented in **TABLE 0.7**.

TABLE 0.7 PROPOSED STANDARD & MIDI BUS CORRIDORS IN JAIPUR

ROUTE NO.	FROM	TO	VIA	ROUTE LENGTH (KMS)	NUMBER OF BUSES
STANDARD BUS ROUTES					
1	Airport	Chandpole	Balaji Mod, OTS (MNIT), Gandhi Circle, Rambagh Circle, Statue Circle, C Scheme	16.4	13
2	Airport	Jaipur Railway Metro	OTS (MNIT), Laxi Mandir Tiraha, 22 godam, Govt Press	13.1	11

ROUTE NO.	FROM	TO	VIA	ROUTE LENGTH (KMS)	NUMBER OF BUSES
STANDARD BUS ROUTES					
3	Bagrana	RFC Colony Stop (JDA Parking) (Vaishali)	Amrapali, Rotary Circle, Trimurty, 22 godam, Ram Nagar metro, Purani Chungi	22.4	17
4	Achrol	Transport Nagar	Gunawata, Dhandh, Kukas, Hathi Gaon, Jaisinghpura, Guru nanak dev circle, Galta Gate	30	22
5	Chonp	Sanganer Junction	Bagwara, Daulatpura, Laxminarayanpura, VKIA, Laxmi Nagar, Ram Nagar Extn, Nemi Nagar Extn, 200ft Ajmer, Mansarovar metro, VT Road circle, New Sanganer	41.4	30
6	Jamwa Ramgarh	Transport Nagar	Heerawala. Saipura, Nai ki Thade, Rohit Nagar, Ganga Vihar	28.2	21
7	Mahala Rajasthan Housing Board (RHB)	Mansarovar Depot	Jaipur Logistics Park, Chitroli Bus stand, Thikariya Mod, Bhankrota, Heerapura, Jaisinghpura	30.8	23
8	Prahladpura	New Gate	Bagda meena chouraha, Akshay Patra Circle, Bhartiya Vidhya Bhawan, Maharana Pratap Circle, 7 No. Chauraha, Jagatpura Railway Station, Balaji Mod, Rajasthan Internation Centre, OTS (MNIT), Jawahar Kala Kendra, JDA circle	25.7	19
9	Pratap Nagar	Bassi Bus Stand	Jagatpura, Dantli, Khatipura Railway Station, Luniyawas, Prem Nagar, Kanota	41	30
10	Kalwar	Pachar	Extension of existing JCTSL route number 24	5.2	
TOTAL NETWORK LENGTH (KM) AND NUMBER OF BUSES				**254.2**	**187**
MIDI BUS ROUTES					
1	200 ft Ajmer Stop	Bindayaka (RIICO)	Gandhipath Puliya, Panchawala Puliya, Kanakpura Railway Station, Hatoj Mod	12	10
2	Ashok Marg	Ring Road (Bagrana)	New Gate, Golcha Garden, Vidyadhar Bagh, Ghat ki Guni Bus stop, Tilak Hospoital	13	11
3	Chandpole	Amber Fort	Hawa Mahal, Joraver Singh Gate, Jal Mahal, Air Force Office	10.2	9
4	Choti Choupar	Krishna Colony	Ramgarh, Ramgarh Mod Bus Stand, Sri Guru Gobind Ji Circle, Sadwa Masjid Mod,	11.3	10
5	Civil Lines Metro	Kardhani Govindpura	KV No. 4, Vaishali Circle, Bajari Mandi, Kanakpura	13.9	11
6	Gopalpura	Kho Nagoriyan	MNIT, KV No. 3, Rajput Colony, Haldiya Garden, Model Town, Jagatpura Railway crossing, Railway Officers Colony, RTO Jagatpura	12	10

ROUTE NO.	FROM	TO	VIA	ROUTE LENGTH (KMS)	NUMBER OF BUSES
STANDARD BUS ROUTES					
7	Harmada	Jairampura	Nindar Fort, Govindpura	12	10
8	India Gate Choraha	Ring Road (Siroli)	Gautam Buddha Circle, Riksha Narsinghpura Circle, Siroli	11	9
9	Lalarpura	Khasa Kothi	Jaipur Club, Khatipura, Vijay Dwar, Gandhi Path Pulia	11.2	9
10	Mansarovar Metro	Vardhman Horizon	Kings road, Purani Chungi, Amrapali Circle, Khatipura Mod, Jhotwara, Ajay Circle	14	11
11	Nehru Bal Udhyan	Khatipura Railway Station	KV No. 1, Gandhi Circle, Aranya Bhawan, RSEB Substation, Jawahar Nagar Circle, Transport Nagar, Vidhyadhar Bagh, New Khadelwal Nagar, Oberoi Rajvilas, Luniyawas, Ropada Mod	19.5	15
12	Prahladpura	Chaksu	Shivdaspura, 19 Mill, Sri Ram Circle, Jujhapura, Shitla Mata	15.7	13
13	Ram Bagh Circle	Bhakrota	Ambedkar Circle, 22 Godam, Ramnagar metro, Purani Chungi, Heera Nagar, 200 Ft bypass, Kamla Nehru Pulia	12.4	10
14	Todi Mod	Jahaota Bus Stand	Shri Balaji Dham Colony, Rampura (Dabri)	13.1	11
15	VKI Road. No. 14	Daulatpura	Laxminarayanpura	12.4	10
TOTAL NETWORK LENGTH (KM) AND NUMBER OF BUSES				**193.7**	**160**

The total fleet requirement for the city bus system has been estimated at 1,200 buses for the horizon year 2055, proposed to be inducted in three phased stages.

At present, three main depots (at Sindhi Camp, Pratap Nagar, and Vidhyadhar Nagar) are operational. It is proposed to develop Heerapura as the major intercity bus terminal where majority of intercity buses (government & private) are proposed to be originated/ terminated.

In addition, Satellite bus terminals have been proposed at Bagrana, Pratap Nagar, Vidyadhar Nagar & Transport Nagar. Depot cum terminals have been proposed at Balmukundpura, Shivadaspura, Kanauta and Achrol

c. Charging Infrastructure for E-Buses

Charging infrastructure deployment is a crucial factor of electric vehicle adoption. The charging stations can be set up at bus depots or at specific locations based on the requirement as shown in **Table 0.8.**

TABLE 0.8: PROPOSED CHARGING STATIONS FOR E-BUS

S. NO.	PROPOSED CHARGING STATIONS
1	AGARWAL FARM BUS STOP
2	SANGANER DEPOT
3	RAMNIWASH BAGH UNDERGROUNG PARKING
4	HIRAPURA BUS TERMINAL
5	DANTALI PHATAK OVERBRIDGE
6	UNDER SITAPURA OVERBRIDGE NEAR MAHATMA GHANDHI HOSPITAL
7	TRANSPORT NAGAR BUS STAND
8	CHANDPOLE, OPISITE JANANA HOSPITAL
9	VIDYADHAR NAGAR DEPOT
10	JCTSL BUS SHELTER, DELHI ROAD, LOCATED OUTSIDE THE GATE OF KHOLE HANUMANJI TEMPLE
11	SINDHI CAMP BUS TERMINAL

d. Intermediate Public Transport (IPT) System

A total of 29 IPT (Auto/ E-rickshaw) routes are also proposed to complement the bus services and act as a feeder to bus routes. The proposed IPT routes are presented in **TABLE 0.9.** To support the transition to e-autos, provision of adequate charging infrastructure and battery swapping stations has been envisaged at strategic locations across the city. These facilities are proposed to be located near major auto stands, transit hubs, bus terminals, metro stations, and high-demand activity centres to ensure operational convenience and minimise vehicle downtime. The locations proposed for E-auto Charging/Battery Swapping stations are presented at **Table 0.10.**

TABLE 0.9 PROPOSED IPT ROUTES

S. NO.	FROM	TO	LENGTH (KM)
1	200 ft Ajmer Bus Stop	Hyatt Regency	8.5
2	Badi Chaupar	Jawahar Nagar	5.9
3	B2 Bypass Circle	Jagatpura Rly Stn	6.2
4	B2 Bypass Circle	Mansarovar Metro	7.8
5	B2 Bypass Circle	Muhana Anaj Mandi	10.9
6	Chandpole Metro	Vidhyadhar Nagar PS	6.4
7	Durgapura PS	Bharatmata Circle	8.9
8	Durgapura PS	Sector 2	5.1
9	Goner Mod PS	Vatika	7.8
10	Goner Mod PS	Goner Bus Stand	8.4
11	Hawa Mahal	Rohit Nagar 5	8.9
12	Krishna Colony	Naradpura Bus Stop	4
13	Nehru Bal Udyan	Mahesh Nagar Bus Stop	5.6
14	New Atish Mkt Metro	Gopalpura PS	3.6

S. NO.	FROM	TO	LENGTH (KM)
15	Pratap Nagar PS	Dadiya	6.5
16	Pratap Nagar PS	Vivek Techno School	9.8
17	Prahladpura	Chandlai	6
18	Rambagh PS	Ramnagar Metro	5.5
19	Ramnagar Metro	Dhawas	6.6
20	Sanganer PS	Ratliya	8.9
21	Sanganer PS	Sanganer Rly Station	3.5
22	SMS Hospital PS	Maheshwari Heights	5.4
23	Sitapura PS	Arshadeep (Jeerota)	5.8
24	Todi Mod	Thadi Bus Stop	5
25	Transport Nagar PS	Ganga Vihar	9.8
26	VKI RD NO. 9	ICI Transformers	4.6
27	VKI RD NO. 14	Niwaru Bus Stop	8.2
28	VKI RD NO. 14	Nindhar Benar Rly Stn	5
29	Shyam Nagar Metro	200 ft Ajmer Bus Sto	4
TOTAL NETWORK LENGTH (KM)			192.6

TABLE 0.10: LOCATIONS PROPOSED FOR E-AUTO CHARGING/BATTERY SWAPPING STATIONS

S. NO.	PROPOSED LOCATIONS
1	VKIA Rd 14 Metro station
2	Vidhyadhar Nagar Sec 2 Metro station
3	Collectorate Metro station
4	Chandpole Metro station
5	Civil Lines Metro station
6	Ramganj Choupar
7	Narayan Circle Metro station
8	Nehru Udhyan
9	Gandhi Circle
10	Mansarovar Metro station
11	Riddhi Siddhi Circle
12	MNIT Circle (OTS Circle)
13	Bhagat Singh Chauraha, New Sanganer Road
14	Sitapura Metro station

e. No e-rickshaw zones

To ensure smooth traffic flow and enhance road safety, No E-Rickshaw Zones are proposed in identified high-capacity arterial roads, grade-separated corridors, and congestion-prone areas of the city. Total 10 routes have been proposed as given in **Table 0.11.**

TABLE 0.11: PROPOSED NO E-RICKSHAW ROUTES

S. No.	NAME OF ROAD	LENGTH (KM)
1	GP Colony	3.0
2	Sisodiya Rani Bagh	2.5
3	Khatipura to GTB	10.0
4	Jagatpura to Akshaypatra	7.5
5	Kalwar to 200ft Road	3.5
6	Bharatmata Circle to Iskcon	3.5
7	Sanganer to Sitapura	5.5
8	Riddhi Siddhi Road	1.0
9	Junction Number 14	2.0
10	Jaipur Station to Chikankara	3.5

0.4.3. Road Network Development Plan

a. Outer Ring Road

The Northern Alignment of the Outer Ring Road (ORR) is planned to traverse through the peripheral areas of Bagru, Pachar, Jaitpura, Achrol, and Bhanpur Kalan forming a strategic circumferential corridor around the northern edge of the urban area and connecting the satellite towns. The total length of the proposed northern alignment is approximately 99 km.

The main transport corridor of the Ring Road is planned as a 90 m wide strip, for development of a 6-lane access-controlled carriageway (3 lanes on each side, with median and service facilities). Service roads / slip roads are proposed along either side within the remaining width to segregate through traffic from local access. The Development Corridor / PAP Corridor (135 m on either side) will accommodate supporting infrastructure such as utility corridors, feeder roads, drainage, landscaping, and resettlement.

b. Grade Separated Facilities

To address rising traffic congestion at critical junctions and along high-volume corridors, grade-separated facilities such as flyovers, underpasses, and elevated corridors are proposed at key locations across Jaipur. Details of the proposed interventions have been summarized in **TABLE 0.12.**

TABLE 0.12 PROPOSED GRADE SEPARATED FACILITIES

S. NO.	PROPOSED ELEVATED ROADS /FLYOVER/ UNDERPASS	LENGTH (IN KM)
1	Todi Mod (Flyover)	0.6
2	Nindar Mod (Flyover)	0.7
3	14 No. Road Junction (NH 48 and NH 52) (Flyover/Underpass)	0.8
4	JDA Circle to Moti Doongri (Flyover)	0.9
5	Vijay Dwar (Flyover)	0.8
6	Gopalpura Puliya (Underpass)	0.7
7	Aranya Bhawan to Jagatpura ROB (Elevated Road)	4.4
8	Kanouta Junction (Flyover)	1.0
9	New Sanganer Road – Bhagat Singh Chouraha (Flyover)	0.8
10	Chauradiya Petrol Pump to Sanganer Circle (Elevated Road)	1.2
11	Bilwa (Flyover)	1.8
12	Ajmer Road to Delhi Road at 200ft Bypass (one way – left turn Flyover)	0.6
13	Mansarovar Road to Delhi Road at 200ft Bypass (Underpass)	0.6
14	DCM road to existing flyover on Ajmer road at 200 ft Bypass (Flyover)	0.6

c. Proposals for Road Widening

To address capacity constraints, improve traffic operations, and enhance overall road safety in Jaipur and improve regional connectivity, several roads are proposed for widening as tabulated in **TABLE 0.13**.

TABLE 0.13 PROPOSED NEW ROADS IN JAIPUR

S. NO.	PROPOSED ROADS FOR WIDENING	LENGTH OF ROAD (KM)
1	Rampura Dabri to Jahota (2 Lane to 4 Lane)	4.3
2	Bagwara (2 Lane to 4 Lane)	1.5
3	Dhand to Bhanpur Kalan (2 Lane to 4 Lane)	2.8
4	VKIA (Internal Roads)	3.0
5	Jhotwara (2 Lane to 4 Lane)	3.0
6	Vidhyadhar to Sikar House (2/4 Lane to 4/6 Lane)	3.5
7	Collectorate (Shiv Marg, Madho Singh Rd. Kanti Chandra Rd) (2 Lane to 4 Lane)	3.5

S. NO.	PROPOSED ROADS FOR WIDENING	LENGTH OF ROAD (KM)
8	Station to Collectorate (2 Lane to 4 Lane)	1.8
9	Amrapali Circle (2 Lane to 4 Lane Divided)	2.5
10	Lalpura to Vijay Dwar (2/4 Lane to 4 Lane Divided)	4.5
11	Jaisinghpura to Bawadi (2 Lane to 4 Lane)	10.2
12	Heerapura (2 Lane to 4 Lane)	3.0
13	Janpath (2 Lane to 4 Lane Divided)	3.2
14	Gandhinagar to 22 Godam (Service Road Wide)	2.8
15	Gandhinagar Station (2 Lane to 4 Lane)	1.0
16	Govind Marg (2/4 Lane to 4 Lane Divided)	3.0
17	Rotary To GTB (2 Lane to 4 Lane Divided)	4.0
18	Mahaveer Nagar (Durgapura Stn Rd Widening)	2.0
19	Jagatpura (Station Road Widening)	3.5
20	Dudawala (Internal Roads)	2.0
21	Bassi (Stn Road) (2 Lane to 4 Lane Divided)	4.5
22	Airport Terminal 1 (2 Lane to 4 Lane Divided)	5.0
23	Pinjrapol (Internal Rd) (2 Lane to 4 Lane)	1.5
24	Chaksu (2 Lane to 4 Lane Divided)	7.5
25	Bagru (Internal Roads)	3.0
TOTAL LENGTH OF NETWORK (IN KMS)		**86.6**

d. Proposed Rail Over Bridge/Rail under Bridge

Rail Over Bridges (ROBs)/ Rail Under Bridges (RUBs) have been proposed at 9 major locations across the city. These ROBs/RUBs will play a critical role in easing traffic congestion along major corridors of the city, while also ensuring seamless regional connectivity. The list of proposed locations is summarized in **TABLE 0.14.**

TABLE 0.14 PROPOSED RAIL OVER/UNDER BRIDGES

S. NO.	NAME OF LOCATION	LC NUMBER	PROPOSED ROB/RUB
1	Kanakpura Crossing (Gokulpura)	229	Rail under Bridge (RuB)
2	Govindpura Sirsi Crossing	231	Rail over Bridge (RoB)
3	Hathoj Crossing	232	Rail over Bridge (RoB)
4	Bindayaka Crossing	232	Rail under Bridge (RuB)
5	Shinvad Crossing	234	Rail over Bridge (RoB)
6	Kartarpura Crossing	84	Rail under Bridge (RuB)
7	Mahesh Nagar Crossing	82X	Rail under Bridge (RuB)
8	Jagatpura Crossing	215	Rail under Bridge (RuB)
9	Kalabard Crossing	72	Rail over Bridge (RoB)

0.4.4. NMT Improvement Plan

The proposals under Non-Motorized Transport (NMT) Improvement Plan are:

- Development of Footpaths
- Providing Foot over Bridges (FOBs)
- Development of cycle lanes
- Public bike sharing scheme
- At grade Pedestrian Crossing Facilities

A total network of about 25.5 Km has been proposed for the development of footpaths. NMV lanes have been proposed along those road sections of industrial areas where a substantial share of NMT has been observed. The proposed NMV lanes will benefit the industrial areas along Mansarovar and Sitapura and institutional areas of city. NMV lanes (Type III) have been proposed with total length of about 16 Km.

The pedestrian crossing demand has been estimated based on pedestrian volume surveys carried out in the study. The identified locations for grade separated pedestrian facilities (Foot Over Bridge/Subway) are at following locations:

JDA Circle, OTS Circle (MNIT), Gandhinagar Railway Station, Chomu Pulia, GT Mall, Jawahar Circle (Patrika Gate), Ajmer Road (200ft bypass), MI Road near Ramniwas Bagh Parking, Statue Circle, Gandhi Circle, Jaipur Junction Rly Station, Transport Nagar, Choti Chaupar, Badi Chaupar, Ramganj Chaupar, RIICO Kanta Chauraha, Patel Marg (New Sanganer Road), Gandhi Nagar mod, India Gate (Sitapura).

Public Bicycle Sharing (PBS) is slowly emerging as one of the most sustainable, popular and attractive public transport modes. PBS scheme provides last mile connectivity as

well as eco-friendly travel options for the Metro users. The short trip lengths in the city can be greatly served by a new system of bicycle sharing. For that purpose, the existing and proposed metro stations and institutional and industrial areas have been identified for establishing primary docking stations.

0.4.5. Freight Movement Plan

The complete segregation of freight and local traffic has been proposed by locating direction-oriented freight terminals at the periphery of the city. The four locations have been proposed for the development of freight/ truck terminals. There is a proposal of Transport Nagar on Sikar Road near Todi which is in planning stage by JDA. Apart from these, truck terminals have been proposed on Ajmer Road near Dahmi Kalan, Tonk Road near Prahladpura and Agra Road near Ring Road.

It is proposed here to restrict entrance of Trucks in the Core area during daytime i.e. from 7 a.m. to 11 p.m. All the goods transfer from and to the Core area shall be taken up during the night hours when passenger movement in the Core is minimal. Goods transactions in Core during day time is proposed to take place by IPT.

To manage freight efficiently and minimize traffic disruptions, provision of designated truck lay-bys is proposed. The proposed lay-bys are at New Transport Nagar, Kanakpura, Bagru, Mahindra SEZ.

0.4.6. Traffic Management Measures

a. Parking Management Measures

As a parking management strategy specifically for Core, long-term parking in Core is discouraged. On-street parking is proposed to be discouraged in general, and it should be paid, if provided. To curb on-street parking, the following roads proposed as “No Parking zones” and imposed electronic ticketing/fining system for better enforcement and transparency if someone parks. The roads proposed for banning of on-street parking are Bapu Bazar Road, Nehru Bazar Road, Indira Bazar Road, Chandpole Bazar Road, Tripolia Bazar Road, Station Road from Chandpole to Khasa Kothi, Ashok Marg, Narayan Singh Circle to Trimurty Circle and Prithvi Raj T Point to RBI.

Considering the high parking demand along various road sections and no alternative available for off-street parking facilities, On-street paid parking is proposed along the major roads of Johari Bazar Road, Chaura Rasta Road, Kishanpole Bazar Road, MI Road (Park Street to Ajmeri Gate), Amrapali Marg, Colectorate Circle, Gopalpura Bypass (Triveni Chauraha to Mahesh Nagar).

The following two locations have been identified for the development of multilevel parking in Jaipur.

1. High Court (under construction by JDA)
2. Collectorate Circle (underground parking)

b. Traffic Circulation Plan

Selective one-way traffic circulation plans are proposed at critical corridors and junctions to improve network efficiency, enhance safety, and optimize limited RoW, particularly in high-density and constrained urban areas. These proposals aim to streamline vehicular movement by reducing conflict points at intersections, improving junction capacity, and enabling better allocation of road space for pedestrians, public transport, and non-motorized users. The routes proposed as one way are:

- Khasa Kothi to Chandpole to Shaheed Smarak
- Gandhinagar Railway Station
- One Way Proposal within Walled City

c. Traffic Control Measures

Some major junctions which cater heavy traffic and face congestion due to faulty geometry and absence of traffic control measures have been identified for improvement in junction geometry (**TABLE 0.15**). SCOOT based traffic management is recommended for all mobility corridors in the city.

TABLE 0.15: LOCATION FOR IMPROVEMENT OF JUNCTIONS

S. NO.	PROPOSED LOCATIONS FOR JUNCTION IMPROVEMENT
1	Adarsh (NH 48 & NH 52) Junction
2	Vidhyadhar Nagar (Manipal Hospital) Junction
3	Parshuram Circle
4	Mandir Mod
5	Ramgarh Mod Junction
6	Guru Nanak Devji Circle
7	Khatipura Circle
8	Jaipur Station
9	Government Hostel Junction
10	Vijay Dwar Junction
11	Sodala Junction

S. NO.	PROPOSED LOCATIONS FOR JUNCTION IMPROVEMENT
12	Imli Phatak Junction
13	Ambedkar Circle
14	Rotary (Transport Nagar) Circle
15	Ganga Jamuna Cirlce
16	Riddhi Siddhi Circle
17	VT Road Junction
18	Durgapura Circle
19	Apex Circle
20	Balaji Mod Junction
21	Bhagat Singh Chouraha (New Sanganer)
22	Dwarka Das Park Junction
23	Sanganer Junction
24	Haldi Ghat Gate
25	Akshay Patra Circle

Traffic circulation plan for Sindhi Camp bus terminus area and Transport Nagar bus terminus area is proposed. The street design components and pallets are suggested based on the available right of way (ROW) for pedestrian-friendly environment and smooth circulation.

Traffic Safety Plan is proposed to control the accident and fatality rates in the city, black spots or accident-prone areas need to be addressed on urgent basis. Following measures have been recommended to handle the accident-prone areas:

- Installation of speed tracking devices with video cameras near black spots.
- Setting up of stationary/mobile police posts near black spots.
- Installation of traffic lights at accident prone intersections.
- Centralized emergency setup to omit delay in case of an emergency.
- Redesign of intersections to remove engineering flaws

0.4.7. Regulatory and Institutional Measures

Following regulatory measures are required to bring in improvements in the present scenario.

a. Transport Demand Management

Transportation Demand Management or TDM refers to various strategies that change travel behavior (how, when and where people travel) in order to increase transport system efficiency and achieve specific objectives such as reduced traffic congestion, increased safety, improved mobility for non-drivers, energy conservation and pollution emission reductions.

b. Transit Oriented Development Zones and Nodes

Under the policy, TOD influence zones are delineated within walkable catchments of mass transit facilities such as metro stations, railway stations and other high-capacity public transport systems. These zones are envisaged as high-density, pedestrian-oriented areas supporting a balanced mix of residential, commercial, institutional, and recreational uses, thereby enabling shorter trip lengths and enhanced access to daily activities through public transport.

proposed TOD zones and nodes have been identified for the city and integrated into the planning framework as shown in **Table 0.16.**

TABLE 0.16: PROPOSED TOD ZONES AND NODES

TOD ZONES (CORRIDORS)	TOD NODES
Heerapura – Mansarovar – Badi Chaupar – Transport Nagar (Metro Ph 1)	Jaipur Junction – Khasa Kothi
Tonk Road (Prahladpura –Todi Morh) – Metro Phase 2	Sindhi Camp Bus Terminal
Transport Nagar – Balaji Morh – Jagatpura (Mahal Rd)	Chandpole
MI Road	Heerapura Bus Terminal
Mansarovar – Sanganer	Gandhi Nagar Rly. Station
Gopalpura Bypass	Airport
	Kumbha Marg – Pratap Nagar

c. Institutional Measures

It is proposed to form an organized agency in charge of providing transport services in Jaipur city. For that purpose, a Special Purpose Vehicle (SPV) may be set up as a public-private partnership by way of granting route permits to private bus operators to run their buses in the city. SPV may be formed with the following objectives:

- To create specialized and effective agency to monitor the intra-city public transport system.
- To establish and maintain modern high capacity means of public transport.
- To develop support system for improving transport infrastructure.

d. Enforcement Measures by Traffic Police

Strict enforcement by Police is required to ensure the smooth flow of traffic and implementation of the proposals. Following measures are proposed for the same:

- Traffic education and public awareness programs on regular basis to educate the public on traffic rules and their benefits.
- It is proposed that scheme of Traffic police on motorbikes to impose on the spot fines on traffic offenders may be started to ensure traffic discipline in the city.
- Heavy fines for habitual offenders
- Scheme of mobile courts to check on encroachments on traffic infrastructure and to punish the habitual traffic offenders may also be introduced.
- To play the envisaged role in enforcement, the strengthening of Traffic Police is recommended.

e. Need for Unified Metropolitan Transport Authority (UMTA)

The study proposes that UMTA could be given a larger set of functions through legislation, but be assigned these functions in stages, as the organization evolves and builds capacity, and as higher level of acceptance is achieved about UMTA's role amongst key stakeholders. UMTA could thus first take up the range of functions that today are the key gaps or overlaps and gradually it can look towards rationalizing functions of existing agencies and taking over an appropriate group of functions. In this light, UMTA may be assigned functions which lie between the aforesaid two extremes arrangements, and less complex and feasible in operationalization.

f. Traffic Engineering Cells (TEC)

It is important that Traffic Engineering Cells are established within JMC, JDA & Traffic Police with qualified and adequate staff such as traffic engineers. This will ensure that the traffic schemes are properly implemented with better results and fine-tuned later, if necessary. This will go a long way to improve traffic flow in Jaipur.

0.4.8. Development of Fiscal Measures

a. Fare Policy for Public Transport

The CMP details following components for arriving at a fare policy for public transport.

- Principles for Rational Public Transport Tariff Design
- Effect on Demand of Bus Services
- Subsidy Administration
- Fare Revisions
- Integrated Ticketing and Fare Management Systems

b. Parking Pricing Strategy

One of the important tools to control parking is Parking Pricing. This may include following measures:

- Levy incremental parking fee on on-street parking
- Off street parking charges to be less than the on-street parking charges
- Differential parking fee in the core areas and outside the core area
- Phasing out of on-street parking from major roads and development of off-street parking
- Stringent enforcement measures by way of fine and other penal actions need to be provided for violation of parking rules

As parking is unsatiated demand, it is proposed that regulatory tools need to be adopted to cater parking demand generated by a building inside its own premises. This will cater to the parking demand, likely to be generated by upcoming developments in the city. Broad measures to ensure availability of parking inside building premises include:

- Traffic Impact Assessment (TIA) of new developments
- Provision of ground level and basement parking for estimated parking demand in TIA
- Incremental fee at surface / lower ground level to ensure short term parking

c. Indirect sources for funding Urban Transport infrastructure

NUTP lays emphasis on generation of revenue from indirect sources of funding. CMP proposes exploring such sources for funding for transport projects including:

- Transit Oriented development and Land value capture
- Development rights
- Fuel Cess
- Urban Transport Tax
- Carbon Credits

d. Creation Of Urban Transport Fund (UTF)

CMP proposes creation of UTF to channelize the flow of resources to urban transport projects.

0.4.9. Mobility Improvement Measures Proposed in CMP and NUTP Objectives

The land use and transport measures proposed in the CMP will improve mobility in the metropolitan area and cover the critical issues addressed in the NUTP. **Table 0.17**

summarizes the relationship between the NUTP objectives and the measures proposed in the CMP.

TABLE 0.17 SUMMARY OF MOBILITY IMPROVEMENT MEASURES PROPOSED IN CMP IN RELATION TO NUTP

S. NO.	NUTP OBJECTIVES	PROPOSED MOBILITY IMPROVEMENT MEASURES
1	Priority for Pedestrians	Footpath proposed along all major corridors Recommended cross-section includes footpaths Pedestrian signal phase at critical junctions FOBs/Subways at locations with high pedestrian footfall
2	Priority for Non-Motorized	Dedicated NMV lanes proposed along roads in industrial clusters Recommended cross sections include NMV lanes Proposal for Public E-Bike sharing scheme
3	Priority for Public Transport	• Proposed MRTS Corridors (Phase 2, 3 & 4) • Proposed City Bus Routes and Feeder Bus Routes • Recommended Network for bus operation and IPT operation • Requirement of bus fleet and bus infrastructure is provided including terminals and depots
4	Parking	• Identification of corridors for on-street paid parking and no parking zones • Proposal of multilevel parking at 2 locations
5	Integration of Land Use and Transport Planning	• Intensive land use along major mobility corridors • High capacity public transport along major mobility corridors
6	Equitable Allocation of Road space	• Public transport system is proposed • Pedestrian and NMV lanes are recommended
7	Integrated Public Transport Systems	• Proposed feeder routes and IPT routes integrated with Metro and City Bus system • Proposed 5 direction-oriented bus terminals integrated with various modes
8	Introduction of Para-transit Services	• Proposed Intermediate Public Transport (Shared Auto/E-Rickshaw Routes • Recommended organization of Para-transit operation as a feeder mode to Metro and Bus corridors
9	Freight Traffic Improvement	• 4 freight terminals (direction oriented) have been proposed • Management measures such as entry and time restrictions for heavy vehicles recommended • Loading unloading by IPT during daytime in off street parking locations

0.5. IMPLEMENTATION PLAN

The CMP recommends proposals for public transport system improvement, road network development, pedestrian facilities, non-motorised transport improvement, junction improvement etc. to cater to expected passenger travel demand up to the horizon year 2055. Broad cost estimates have been worked out to assess the requirement of funds for these proposals (**TABLE 0.18**).

TABLE 0.18 TOTAL INVESTMENT REQUIREMENTS

S. No.	Proposals	Units	Quantity (Total)	Cost (In Cr)			Total Cost (Rs in Crore)
				Phase I (2025-31)	Phase II (2031-41)	Phase III (2041-55)	
1	**Public Transport Improvement Proposals**						
a	Mass Rapid Transit (MRT) Corridors	per Km	**138.1**	14980.0	20230.0	13125.0	48335.0
b	Electric Buses - Standard	per Bus	**650.0**	568.8	315.0	253.8	1137.5
c	Electric Buses - Midi	per Bus	**550.0**	225.0	200.0	125.0	550.0
d	Bus Terminal and Depot	per terminal	**10.0**	300.0	200.0	0.0	500.0
e	Bus E-charging stations	per location	**11.0**	15.0	9.0	9.0	33.0
f	Bus shelters development and upgradation	per location	**300.0**	90.0	60.0	30.0	180.0
g	Auto e-charging stations	per location	**14.0**	8.0	3.0	3.0	14.0
h	Battery swapping stations	per location	**14.0**	7.5	7.5	6.0	21.0
2	**Terminals**						
a	Freight Terminals	per terminal	**4.0**	120.0	120.0	0.0	240.0
b	Truck LayByes	per location	**8.0**	20.0	20.0	0.0	40.0
3	**Road Improvement Projects**						
a	Outer Ring Road (6 lane c/w) (NHAI Proposal)	sq. m	**2079000**	1040.0	0.0		1040.0
b	Road Widening	Per sqm	**1082500**	500.0	366.0	0.0	866.0
c	Rail Over Bridge/ Under Bridge (4 lane c/w)	per location	**9.0**	350.0	280.0	0.0	630.0
d	Flyovers/underpasses	per Km	**10.0**	600.0	300.0	300.0	1200.0
4	**NMT Infrastructure**						0.0
a	Footpath (1.5-2.5 m wide)	Per sqm	**51000**	30.0	21.0	0.0	51.0
b	NMV Lane (2-3 m wide)	Per sqm	**32000**	11.0	21.0	0.0	32.0
c	Pedestrian Crossing Facilities	per sqm	**17.0**	5.1	0.0	0.0	5.1
d	Pedestrian Grade Separated Facilities	per location	**19.0**	22.0	16.0		38.0
e	Public Bike Sharing	per location	**14.0**	2.0	1.5		3.5
5	**Geometric Improvement of Junctions**	Per location	**25.0**	22.5	0.0		22.5
6	**Parking**						0.0
a	Multilevel Parking (RITES Proposal)	ECS	600.0	48.0			48.0
b	Parking Zones (mandatory signages)	per no.	100.0	18.8	6.3		25.0
c	On-street Parking	per no.	7.0	2.8			2.8
7	**Integrated Command Control Centre & SCOOT**	per location	1.0	50.0			50.0
	Adaptive Traffic Signal Junction	per location	50.0	25.0	25.0		50.0
	Total			**19035.9**	**22176.3**	**13851.8**	**55063.9**

CHAPTER – 1
INTRODUCTION

1. INTRODUCTION

1.1 SUSTAINABLE MOBILITY PRINCIPLES

Sustainable mobility means satisfying the needs of the current generation without compromising the ability to satisfy the needs of future generations. Sustainable mobility is therefore the mobility model that enables movement with minimal environmental and territorial impact. The current model of travel in Indian cities is unsustainable as it is fundamentally based on motorized transport and, specifically, the use of private vehicles.

A model of sustainable mobility would be one in whose means of transport consume the least energy and produce less pollution per kilometer travelled and passengers have greater recognition (travel on foot, by bicycle, collective transport and shared car). To achieve this, there are the following 8 principles that guide the sustainable transport and development:

1. Walk - Develop neighborhoods that promote walking
2. Cycle - Prioritize non-motorized transport networks
3. Connect - Create dense networks of streets and paths
4. Transit - Locate development near high-quality public transport
5. Mix - Plan for mixed landuse
6. Densify - Optimize density and transit capacity
7. Compact - Create regions with short commutes
8. Shift - Increase mobility by regulating parking and road use

Thus, a Sustainable Urban Mobility Plan for a city is a strategic plan designed to satisfy the mobility needs of people and businesses in cities and their surroundings for a better quality of life. It builds on existing planning practices and takes due consideration of integration, participation, and evaluation principles.

CMP Jaipur is a Sustainable Urban Mobility Plan for the city with a long-term vision for desirable accessibility and mobility pattern for people and goods in the urban agglomeration. It focuses on the mobility of people to address urban transport problems and promote better use of existing infrastructure (i.e., improvement of public transport, pedestrian and NMT facilities) which leads to the integration of land use and transport development and is essential for building smart cities.

Jaipur, the capital of Rajasthan state, is a heritage city and one of the major tourist destinations in the country. It is situated on the Northwest part of India and is referred as the Pink City. Besides being one of the metropolitan cities in the country, it is a renowned centre of education, trade, commerce, and industry.

Over the last decade the city's population has experienced a compound annual growth rate (CAGR) of 2.83% per annum. In addition to being the commercial capital of Rajasthan, Jaipur is also one of the most sought-after tourist destinations in the world with about 70,000-80,000 tourists visiting the city every day during the tourist season. Also, the city has been experiencing explosive growth in the number of registered vehicles.

As Jaipur rapidly urbanizes and its metropolitan areas expand, efficient transport systems become crucial to facilitate the movement of people and goods. The increased travel demand, combined with limited urban transport facilities and services, results in significant pressure on transport systems that are often insufficient, deteriorating, and poorly managed. This leads to issues such as increased motorization, congestion, travel delays, loss of productivity, excessive fuel consumption, deteriorating air quality, noise pollution, and a rise in road accidents and fatalities. Additionally, inadequate transport systems limit accessibility to employment, services, education, and other opportunities, contributing to social exclusion.

As per Ministry of Housing & Urban Affairs (MoHUA) Guidelines – 2017, Comprehensive Mobility Plan shall be revised and prepared at least once in every five years to address the constantly changing scenarios of mobility in the city. With a view to developing an effective and efficient urban transport system, Jaipur Development Authority has decided to undertake a comprehensive mobility study in Jaipur. For this purpose, RITES Ltd. has been engaged to prepare Comprehensive Mobility Plan for Jaipur.

1.2 IMPACT OF REGIONAL/NATIONAL FRAMEWORK

Gemstone cuttings, manufacture of jewellery, textiles and information technology are major economic generators besides boosting tourism. Within the last few years, Jaipur has also emerged as a major educational hub with the presence of various prestigious universities such as Manipal University, Amity University, BITS-Mesra, Poornima University, JECRC University, LNM Institute of Information Technology, etc. Moreover, Jaipur is also a nucleus for arts and crafts. It has many traditional shops selling antiques, jewellery, handicrafts, gems, bangles, pottery, carpets, textiles, leather and metal products and other cottage industry products. Jaipur is one of India's largest manufacturers of hand-knotted rugs.

The main commercial center in the city is Walled City where more than 60% of the commercial activities are concentrated. Some of the main commercial centers/ roads in Walled City are Bapu Bazar, Nehru Bazar, Johari Bazar, Tripolia Bazar and Sanjay Bazar. Apart from the walled city, there are few planned commercial centers in the study area including Lal Kothi District Centre, Subhash Nagar District Centre,

Vidhyadhar Nagar Central Spine, Indira Place, JLN Marg, Jagatpura Central Spine and New Aatish Market.

There are six major industrial areas in the city namely Vishwakarma Industries Association (VKIA), Jhotwara, Kanakpura, and Bindayaka in the northwest; Sitapura and Sanganer industrial areas in the south of the city; and Malviya industrial area in the southeast. The unorganized industry is mainly concentrated in the Sanganer town and surroundings. A number of household industries are also present in Jaipur, mostly in the 'walled city' and are engaged in works such as stone cutting and polishing, blue pottery, lac work, gota sculptures etc.

IT/ITeS companies in Jaipur are mostly located in the Mahindra World City. Spread over 750 acres, it is one of the largest IT Special Economic Zones (SEZ) in India. Mahindra World City is a joint venture of RIICO and the Mahindra group.

Jaipur District falls under Delhi-Mumbai Industrial Corridor (DMIC), the purpose of which is to enhance development of Industries. Railways have proposed six Freight Logistics Parks along DMIC, one among them is in Jaipur. RIICO has developed 51 industrial areas in the district namely Bagru, Bassi, Bias Godam, Bindyaka, Dudu, Hirawala, Jaitpura, Jhotwara, Kaldera, Kankapura, Kartarpura, Malviya Nagar, Phulera, Renwal, Sanganer, Shahpura, Sitapura, Sudarshanpur, Vishwakarma etc.

1.3 NATIONAL URBAN TRANSPORT POLICY

The National Urban Transport Policy (NUTP) has been formulated by the then Ministry of Urban Development (MoUD) to transform the current urban transport system into a safe, convenient affordable, quick, comfortable, reliable and efficient transportation system across all urban areas in India. The objectives are:

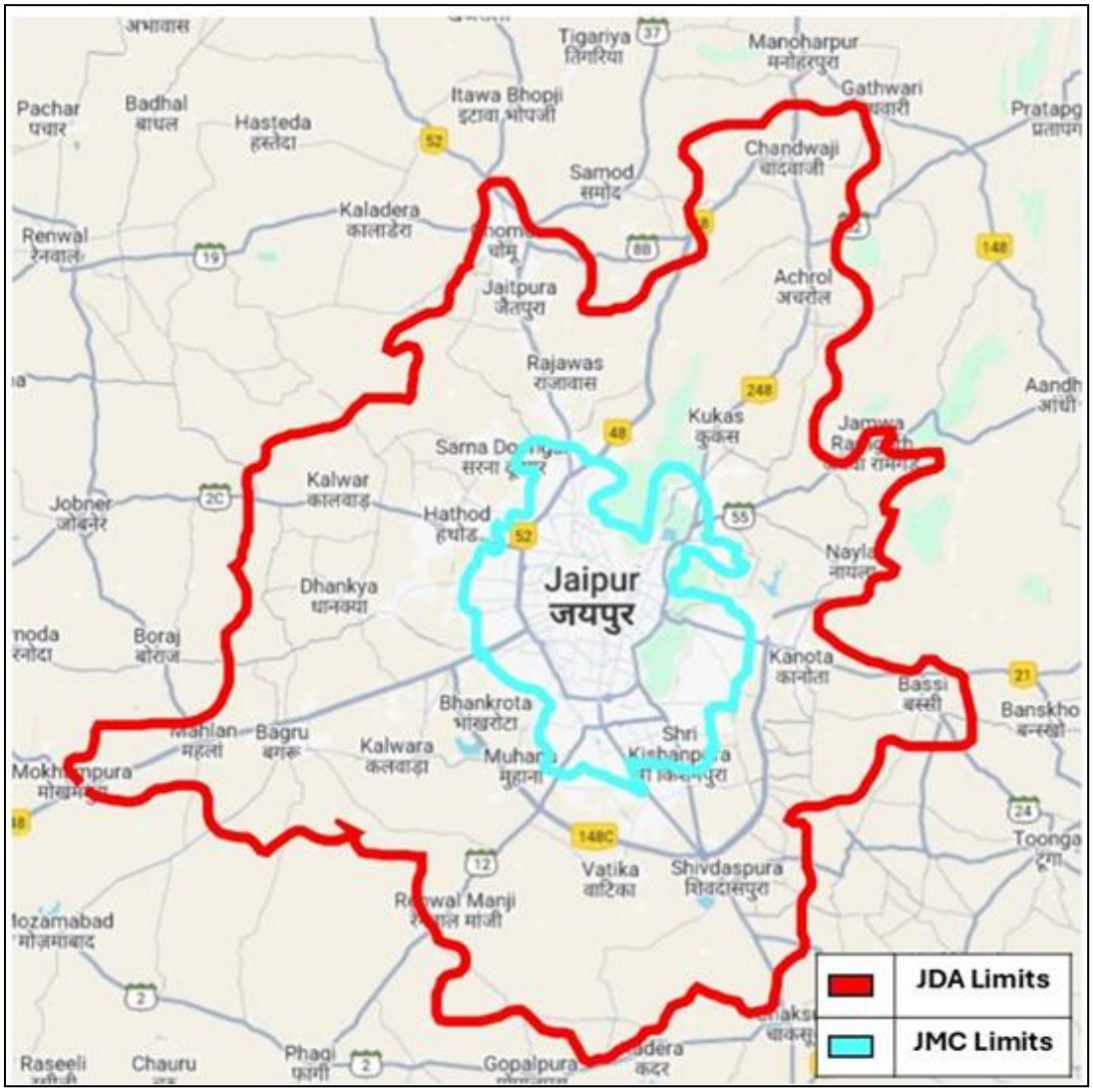
- Incorporating urban transportation as an important parameter at the urban planning stage rather than being a consequential requirement.
- Bringing about a more equitable allocation of road space with people, rather than vehicles, as its main focus.
- Public Transport should be citywide, safe, seamless, user friendly, reliable and should provide good ambience with well-behaved drivers and conductors.
- Walk and cycle should become safe modes of urban transport.
- Introducing Intelligent Transport Systems for traffic management
- Addressing concerns of road safety and trauma response
- Raising finances, through innovative mechanisms
- Establishing institutional mechanisms for enhanced coordination in planning and management of transport systems.

Building capacity (institutional and manpower) to plan for sustainable urban transport and establishing knowledge management system that would service the needs of all urban transport professionals, such as planners, researchers, teachers, students, etc.

1.4 DELINEATION OF PLANNING AREA

The study area for the current assignment is Jaipur Region (with an area of about 2,940 sq. km.), which comprises of Jaipur Municipal Corporation (JMC) with an area of 467 sq. km. and 15 satellite towns such as Chomu, Bagru, Bassi etc. along with 725 revenue villages. The study area is shown in **Figure 1.1**. The historic walled city is part of the JMC and is spread over an area of 6.7 sq. km. The walled city (also known as pink city) is characterized by presence of heritage buildings and high commercial activities. It has a high population density of more than 481 persons per hectare (presently, about 580 persons per hectare), while the population density of JMC is 65 persons per hectare.

FIGURE 1.1: STUDY AREA



1.5 VISION AND OBJECTIVES OF MOBILITY PLAN

The vision of the CMP is to achieve safe, efficient, reliable and seamless mobility in Jaipur and to make it a model city. The main objectives have been outlined as under:

- Develop strategies and policies for sustainable transport system at the state and city levels.
- Encourage city bus services in key urban areas of the state.
- Introduce eco-friendly mobility solutions by incorporating electric buses.
- Provide guidance and technical support to City Transport Special Purpose Vehicles (SPVs) for implementing city bus services.
- Plan and execute necessary infrastructure, such as city bus terminals, bus depots, and charging stations.
- Understand the socio-economic background and travel patterns
- Develop and use an Urban Transport Planning (UTP) model with advanced techniques and CUBE/VISUM software.
- Evaluate the current strategy, explore consequences of alternative transportation approaches, and recommend/update short, medium, and long-term transportation strategies based on cost-benefit analysis.
- Aligning with National Urban Transport Policy goals, prioritizing efficient public transport and non-motorized modes to discourage individual private vehicle growth.
- Ensure the implementation of the most suitable, sustainable, and cost-effective urban transport program with a regional perspective.
- Integrate transport and parking policies into urban planning strategies.
- Propose a phased investment plan and policy recommendations for all transportation modes, integrating mass transit and public transport with Intermediate Public Transport (IPT).
- Recommend institutional mechanisms for inter-agency coordination.
- Strengthen transport planning skills and share acquired data, planning models/tools, and knowledge. Develop a summarized action plan for improvement

1.6 DEMOGRAPHIC CHARACTERISTICS

1.6.1 POPULATION

The Study Area is the Jaipur Development Authority Area (2940 Sq. Km.) as delineated in Jaipur Master Plan - 2025 which includes Jaipur Municipal Corporation, 15 Satellite

Towns and 725 Villages. According to 2011 census of India, study area had a population of 40,50,087.

The growth rate of population over the two decades – 1991-2011 in the study area is given in **Table 1.1** It can be observed that the overall decadal growth rate declined from 49.3% to 31.2%. It can also be observed that about 10 lakh population is getting added to the study area every decade since 1991. In general, population growth rate decreased in the decade 2001-2011 compared with the previous decade (i.e., 1991-2001) in all the zones of the study area including JMC.

TABLE 1.1: POPULATION GROWTH TRENDS IN JAIPUR CITY

YEAR	POPULATION	% DECADAL GROWTH
1991	20,68,180	-
2001	30,87,933	49.30%
2011	40,50,047	31.20%

Source: Census 2001 and 2011

The population of the study area has been forecasted for the horizon year of 2055 based on several considerations, which are listed below:

- Development plan, existing and proposed land-use
- Past growth trends including growth rates assumed in CTTS Jaipur, 2022
- Major transportation infrastructure projects
- Growth direction and transport infrastructure likely to be developed
- Socio-economic growth trends
- High density development along major transport corridors (transit-oriented development

Based on the above considerations, the population forecast has been made for a horizon period of 30 years and the details are presented in **Table 1.2.**

TABLE 1.2: POPULATION PROJECTIONS IN STUDY AREA

YEAR	POPULATION (LAKH)	GROWTH RATE (%, P.A.)
2011	40.5	-
2024	55.86	2.6
2031	66.42	2.5
2041	83.15	2.3
2051	95.76	1.4
2055	101.3	1.4

1.6.2 EMPLOYMENT GROWTH

As per the Census 2011, total no. of workers in the study area was 13.6 Lakh which constituted 34% of the total population. The work force participation rate (WFPR) was 34% in 2011 which was assumed to be increased to 36% in 2031 as per CTTS Jaipur 2022. However, assuming better economic conditions in future years, higher WFPR has been adopted for horizon years of 2041 and 2051. **TABLE 1.3** shows the WFPR assumptions and estimated employment in study area for horizon years.

TABLE 1.3: EMPLOYMENT PROJECTIONS IN STUDY AREA

YEAR	EMPLOYMENT (LAKH)	WFPR (%)
2011	13.6	34%
2024	19.5	35%
2031	23.9	36%
2041	31.6	38%
2051	37.3	39%
2055	39.5	39%

1.7 TOURIST INFLUX

Being part of the golden triangle and known for its majestic palaces, historic forts and vibrant markets, Jaipur attracts significant domestic and international tourists. Tourism is a major contributor to Jaipur's economy, supporting local revenues and providing large-scale employment opportunities.

The total tourist arrivals in Jaipur in the year 2024-25 is about 99.05 Lakh out of which 92.84 Lakh are domestic tourists and 6.21 Lakh are foreign tourists. The annual tourist footfall in Jaipur from years 2018 – 2025 is presented in **Table 1.4.** The tourist inflow to Jaipur exhibits strong seasonality, with peak footfall observed during the period from August to December. The city serves as the primary gateway for international tourism in the state, accounting for nearly 40% of the total foreign tourist arrivals to Rajasthan.

TABLE 1.4: ANNUAL TOURIST FOOTFALL IN JAIPUR

YEAR	NUMBER OF TOURISTS			GROWTH RATE (% P.A)
	DOMESTIC	FOREIGN	TOTAL	
2018-19	17.88	6.81	24.69	
2019-20	17.3	6.5	23.7	-3.8
2020-21	6.1	1.8	7.9	-66.5
2021-22	9.9	0.1	10.1	26.7
2022-23	33.7	1.6	35.3	250.9
2023-24	50.3	2.2	52.5	48.60
2024-25	92.8	6.2	99.1	88.70

*Source: Rajasthan Tourism Department

1.8 MAJOR ATTRACTION CENTERS

Jaipur is a part of the golden triangle and known for its majestic palaces, historic forts and vibrant markets. Tourism has been a major revenue generator for Jaipur, contributing to the local economy and providing employment opportunities.

Jaipur is home to many fascinating tourist hotspots. The major tourist attractions in the city are presented in **TABLE 1.5.** The map showing major tourist attraction centres in Jaipur is presented in **FIGURE 1.2**.

FIGURE 1.2: MAJOR TOURIST ATTRACTION CENTERS

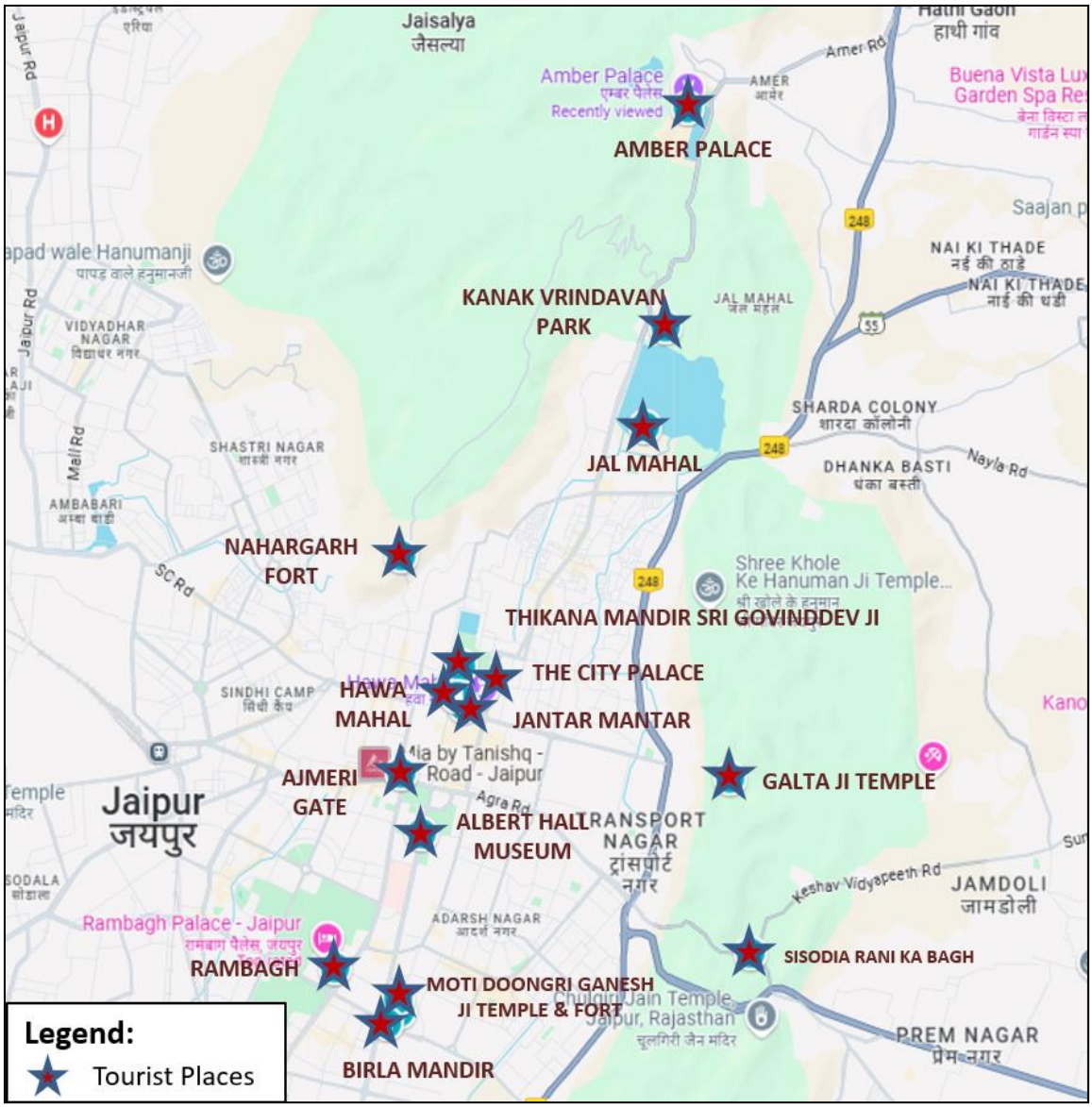


TABLE 1.5: POPULAR TOURIST/HERITAGE SITES IN JAIPUR

TYPE OF TOURIST/HERITAGE SITE	NAME OF TOURIST/ HERITAGE SITE
FORTS/PALACES	Amber, Jaigarh, Nahargarh, Moti Doongri, City Palace, Hawa Mahal, Jal Mahal, Ram Bagh Palace, Madhvendra Palace
TEMPLES	Govind Devji Temple, Ganesh Mandir, Jagat Shiromoni, Temple, Shila Mata Temple, Galtaji Temple, Birla Mandir, Moti Doongri Ganesh Temple, Digambar Jain Mandir, Akshardham
MUSEUMS	Maharaja Sawai Man Singh (II) Museum, Albert Hall Museum, Gaitore, Jaipur Wax Museum, Jawahar Kala Kendra, Amrapali Museum
PARKS AND GARDENS	Jantar Mantar, Kanak Vrindavan, Sisodia Rani Ka Bagh, Vidyadhar Garden, Central Park, Ram Niwas Garden, Sculpture Park
GATES	Ajmeri Gate, New Gate, Sanganeeri Gate, Ghat Gate, Surajpole Gate, Samrat Gate, Zorawar Singh Gate, Gangapole Gate, Amar Jawan Jyoti, Patrika Gate
BAORI	Chand Baori, Chilla Baori, Sawai Baori, Panna Meena Kund, Chhacla Baori, Thattar Baori, Teli Baori

1.9 REVIEW OF AVAILABLE RESOURCES

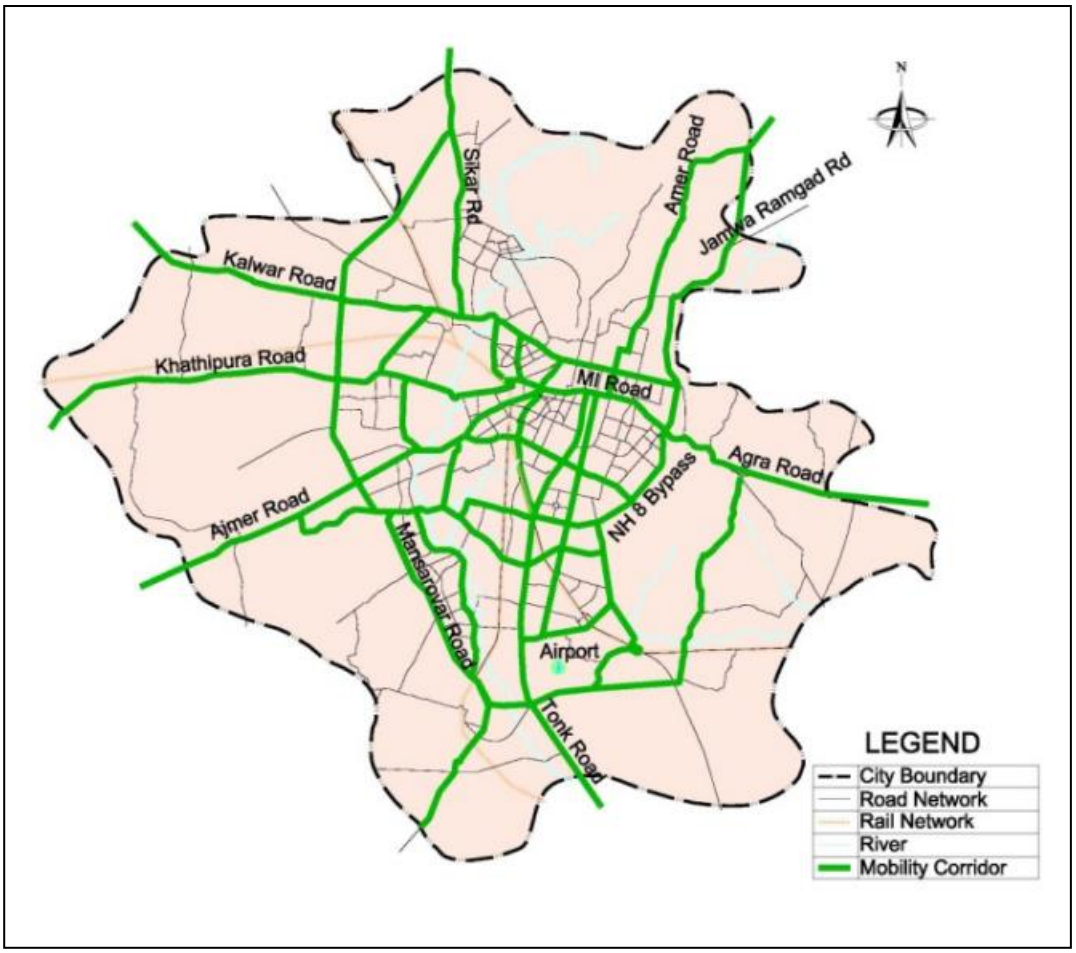
1.9.1 COMPREHENSIVE MOBILITY PLAN FOR JAIPUR, 2010

Comprehensive Mobility Plan (CMP) for Jaipur Region prepared by Jaipur Development Authority aimed to prepare the long-term (20 year horizon) transportation improvement strategy for Jaipur Region (apart from short-term and medium-term strategies) and identify a practicable and effective investment program up to 2031. The following proposals were included in the mobility plan:

- **Mobility Corridor Plan**

  Key Mobility Corridors were identified (**FIGURE 1.3**) with a focus on improving corridor-level mobility. These corridors had been accorded priority for enhancing passenger and vehicular throughput as well as for improving the overall Level of Service (LoS) through targeted capacity augmentation and traffic management measures.

FIGURE 1.3: MOBILITY CORRIDORS IN JAIPUR CITY PROPOSED IN CMP 2010

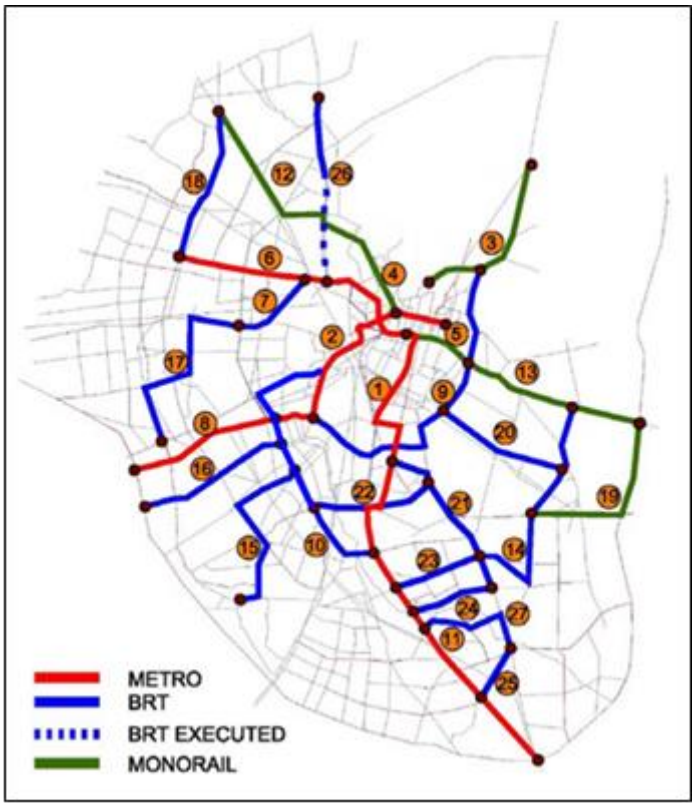


Source: CMP for Jaipur, 2010

- **Public Transit Improvement Plan: 2011- 2031**

  The CMP had proposed a comprehensive public transport build-out including augmentation of the bus fleet by about 2,450 buses, restructuring of bus routes, and development of higher-order mass transit corridors. The implementation was planned in phases for 2010–2016, 2016–2021 and 2021–2031, with figures indicating operational systems and tables showing implementation timelines. The State Government had also indicated that the first section of the Metro from Mansarovar to Chandpole would be taken up first, followed by the remaining sections in subsequent phases.

FIGURE 1.4: PUBLIC TRANSPORT IN JAIPUR CITY PROPOSED IN CMP 2010



Source: CMP for Jaipur, 2010

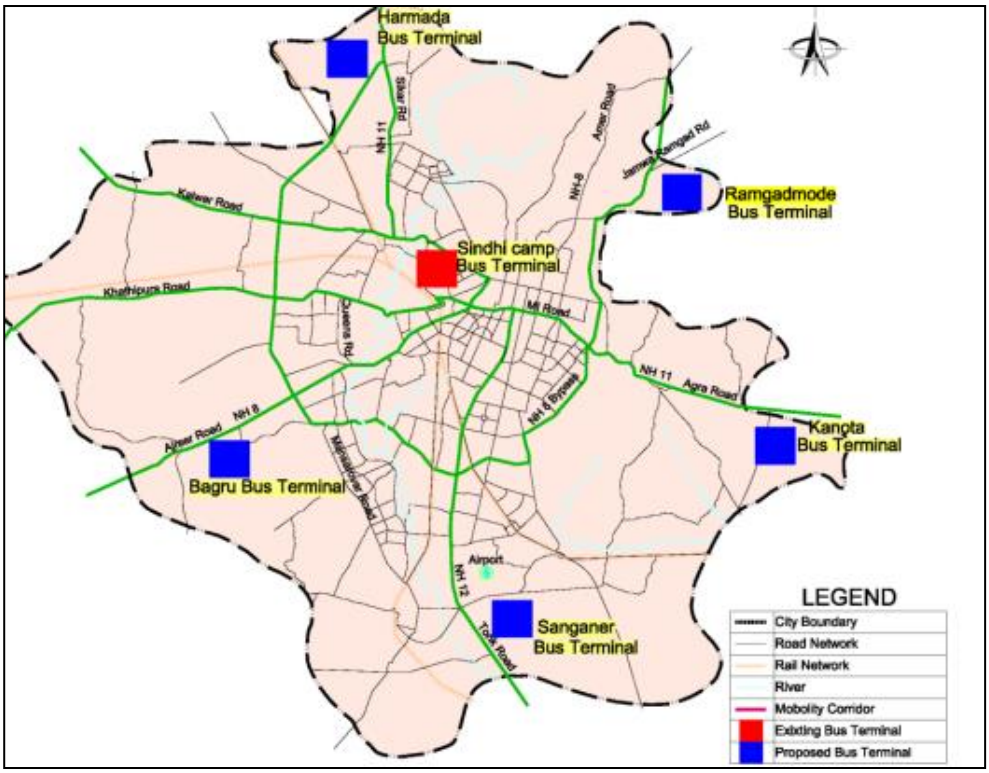
- **New Passenger Terminal Plan**

  The CMP addressed operational and traffic management issues at the Sindhi Camp bus terminal and recommended a micro-level area traffic management approach. Accordingly, the plan proposed shifting bus operations outside the city limits and redistributing them across five peripheral terminals. Sanganer, Bagru, Harmada, Ramgadmode and Kanotha terminals were designated to serve the south, west, north, north-east and east sectors respectively. The CMP also proposed that these terminals be developed with integrated facilities such as parking for buses, bays for local buses, basement car parking, prepaid taxi/autorickshaw booths with dedicated parking lanes, and commercial office spaces as shown in **FIGURE 1.5**.

- **Non- Motorized Transport Plan**

  The CMP proposed a pedestrian-focused transport strategy aiming for a 100% Walkability Index. It recommended footpaths along mobility corridors and major roads, safe crossing facilities, and standard design norms, removal of encroachments and proper maintenance. About 110 km of roads were identified for footpath development. Bicycle lanes were proposed along public transport corridors. A skywalk was proposed between the Railway Station and Sindhi Camp Bus Terminal due to high pedestrian volumes. Grade-separated pedestrian crossings were also proposed at major corridors and pedestrian-intensive locations.

FIGURE 1.5: PASSENGER TERMINAL IN JAIPUR CITY PROPOSED IN CMP 2010



Source: CMP for Jaipur, 2010

- **Traffic Management Plan**

The Comprehensive Mobility Plan included a Traffic Management Plan focusing on junction improvements, provision of bus shelters at bus stops, improved street lighting, road signage and markings, and enhanced safety measures. Several key junctions and corridors were identified for improvement, and similar traffic management interventions were proposed across other critical locations in the city to improve traffic flow, safety, and overall mobility conditions. Junction improvement measures were proposed at the following major locations: Khasakoti Junction, Sanganer Gate Junction, Ghat Gate Junction, Sodala Junction, Dood Mandi Junction, GPO Junction, Transport Nagar Junction, Lalkothi Junction, New Sanganer Road Junction, and Ajmeri Gate Junction.

1.9.2 COMPREHENSIVE TRAFFIC AND TRANSPORTATION STUDY FOR JAIPUR REGION

Comprehensive Traffic and Transportation Study (CTTS) for Jaipur Region prepared by Jaipur Development Authority aimed to prepare the long-term transportation improvement strategy for Jaipur Region (apart from short-term and medium-term strategies) and identify a practicable and effective investment program up to 2037 in line with the National Urban Transport Policy (NUTP), 2006. The following transportation improvement proposals were given in the CTTS:

- **Improvement of Metro Facility**

  Consultants have tested various combinations of metro routes (with respect to various growth centres) using urban transport development model to achieve the maximum ridership along these metro corridors:

  - Phase IA: Mansarovar to Chandpole- Operational
  - Phase IB: Chandpole to Badi Chaupar- Under construction
  - Phase II: Amba Bari to Sitapura

  The proposed extension for the development of the metro is shown in **FIGURE 1.6 .**

- **Development of Sub-urban Rail Route**

  CTTS proposed to operate sub-urban rail system between Viswakarma Industrial Area and Chomu Satellite town (for about a length of 29.5km) considering the growth potential of both the nodes and to develop a public transport dependent/ oriented growth and having daily ridership of 1,121,107.

- **Improvement of Bus Rapid Transit System (BRTS)**

  CTTS proposed to develop BRTS corridor (about 5km) to connect the present isolated corridors along the Khartarpura Nala, which connects Amaba Bari (Sikar Road BRTS corridor) with Vidyut Nagar Bus Stop (Ajmer Road BRTS corridor) through elevated road. A section of the proposed elevated road will form part of the existing elevated road along Ajmer Road.

- **Development of Road Network**

  A four-lane road connecting NH-248 with Purani Basti Road via Bramhpuri road and Jailal Munshi Ki Rasta is proposed for East West Connectivity. An elevated corridor along Khartarpura Nala connecting Ambabari (Sikar Road) with Ajmer Road is proposed. Also, 8 roads with total length of 165 km have been identified for road widening, 7 junctions have been identified for Grade-separated Intersections, 11 locations have been identified for ROBs/RUBs, 5 roads have been identified for corridor development and 5 locations have been identified for developing Truck Terminals.

- **Pedestrian Facilities**

  Vehicular movement shall be restricted on Bapu Bazar and Nehru Bazar from 11:00 am to 9:00 pm and freight movement will be allowed in the night. Proposal to make the road connecting City Palace and Govind Devji Temple as vehicle free zone. About 80.8 km of footpaths to be provided on 31 major identified roads, 12 locations have been identified for the proposal of raised pedestrian crossing locations.

- **Public Transport Facilities**

  Battery operated minibus services was proposed on 5 routes, 3 locations have been identified to develop bus bays, 9 bus terminals have been identified for development and 6 locations have been identified for IPT lanes.

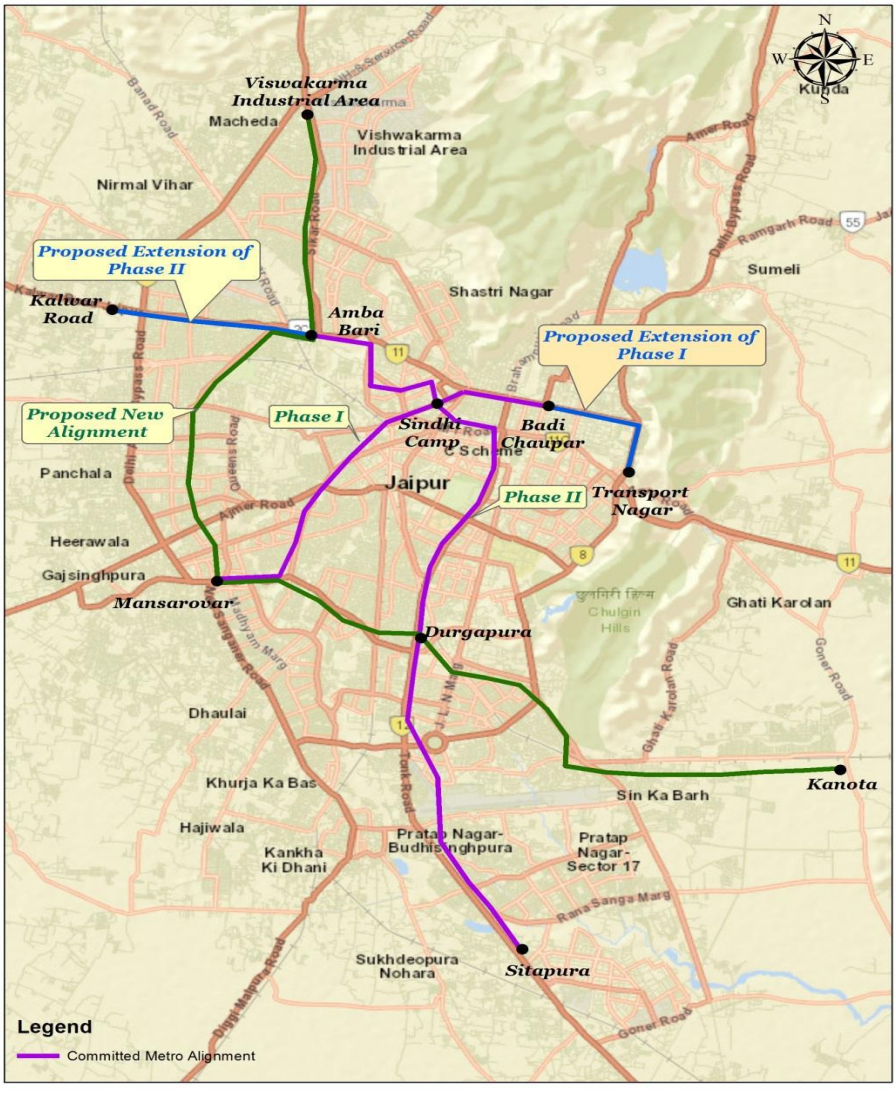
- **Hawkers and Vendors Management**

  20 locations have been identified which have been divided into 3 zones i.e.
  - Green (no restriction) zone)
  - Amber (few restrictions based on time) zone
  - Red (no-vending) zone

- **Parking**

  Revision of On-Street Parking Charges 5 road sections have been identified for the proposal of On-Street Parking Prohibited areas and 10 road sections have been identified for the proposal of a paid parking scheme.

FIGURE 1.6: METRO CORRIDORS IN JAIPUR CITY PROPOSED IN CTTS STUDY



Source: CTTS for Jaipur, 2022

1.9.3 JAIPUR MASTER DEVELOPMENT PLAN 2025

The 'Master Development Plan - 2025' has been prepared by Jaipur Development Authority keeping in view the overall town density, to accommodate 64.95 lakh persons by 2025 within the urbanisable area.

The following critical areas have been the focal points of the Plan:

(a) Land Utilization:

The JDA region has 3 physical planning components with Land utilization category:

- Jaipur City Urbanisable area
  - Urban area (U1): Existing use zones such as residential, including Satellite towns and committed projects
  - Urban area (U2): Immediate influence area of U3 with a 3km buffer following development trend
  - Transportation development area (U3): Influence area of NH, SH, Ring road, Bye pass, Industrial corridor etc.
- Ecological Zone: Eco-Sensitive area (G1), Green Zone-2 (G2) and Ecological Area
- Rural Area: Existing Rural and agricultural belt

(b) Integrated Land use

The land use plan along with Development Promotion and Control Regulation usher a flexible approach in attending to the growing needs of the citizens. Each use zone has provisions to accommodate the required utilities and facilities.

(c) Green/Ecological areas and Landscaping:

- Eco-sensitive areas like reserve/protected forest, drains/rivers, hills and agriculture area are given extra care while planning the development area.
- MDP 2025 plans to develop Rock cut area in Jaipur region. MDP prescribes to develop all surface water bodies like Amanishah Nallah and Dhund River for river front development.

(d) Commercial areas:

Hierarchy of Commercial Spaces are provided at various level Sub city Centre:1 & District Center: 9

(e) Bus Terminals:

Transportation became easier with the provision of Bus terminals at regular interval namely:

- Bus terminal on south of Niwaru Road at the periphery.
- Bus terminal on South of Kalwar Road at the periphery.
- Bus terminal at the extended Sirsi road near Nimera
- Bus terminal south Delhi Railway Line near Khatipura Railway Station.
- Bus terminal at the intersection of Jawahar Nagar Byepass with Shanti path is proposed.

(f) MRTS & BRTS:

Provision of Metro and BRTS to encourage public transportation and improve accessibility while reducing time and cost expenses.

(g) Ring Road:

The ring road development corridor is a visionary plan to create infrastructure through public participation to meet the rapid growth and better connectivity bypassing the heavy traffic coming into the city.

(h) Ghat ki Guni Tunnel:

JDA embarked on a project of a Tunnel to route all heavy and light vehicles with Length of 2800 M including 858 M Twin Tube Tunnel, interconnected at two locations.

(i) Urban Design:

Emphasis on Urban design and visual integration of various components of city viz; walled city, District centers, Historical Monuments and Gardens, Exhibition grounds, Zoo, religious places, transport corridors etc.

(j) Heritage Conservation

Identifying heritage zones, development proposals and preparing special area plan for Heritage and Conservation sites.

(k) Special Area Plan

Special area plan for Degraded/Redevelopment industrial area and Specific Development area plan for Green City and Heritage City.

(l) Public Participation and Plan Implementation:

Decentralised local area planning by participatory approach and Performance oriented planning and development, with focus on implementation and monitoring.

(m) Informal Sector:

The informal and organised sector is a major source of employment in the economic fabric of the city for which the following approach is proposed:

- Proper planning with space management to accommodate these vendors while maintaining a healthy and hygienic environment.
- Hawker's zone needs to be provided at scheme level.
- Adherence to the new township policy provision for space for Kiosk in each scheme.
- Ending zone policy of the State Govt. to be executed in letter and spirit, such accommodations to be construed as provisions of Master plan.
- Provision of common basic services like toilets, water points, etc.

(n) Disaster Management:

Clear depiction of Geological features like fault line, Lineament, Ridge line, seismic zone, etc., to make public understand the situation of their land and to come out with geo-technical measures while going for multi-storeyed construction.

- Efforts have been made to address such situations and accordingly propose these areas under low intensity development.
- Building regulations for safety of structures as per seismic zone.

(o) Sustainable Development

MDP emphasis on making efforts to reduce the effect of air and noise pollution due to urban transport and to protect the environment for sustainable development. It also emphasis on development of green spaces including various ecological areas/nature surrounds residential and commercial areas and water harvesting technology to recharge ground water and increase water table.

(p) Satellite Towns/Growth Centre

In order to have balanced regional development, Master plan is prepared for 11 satellite towns and 4 growth centres within the Jaipur region. These satellite towns will help in reducing migration and urban infrastructural pressure to the mother city.

(q) Quality of Life:

The Master Plan visions an intense and close relationship between the city area and the rural areas including the green belt which will be synergic nature, thus reducing the urban and rural divide that has crept in to planning so far and encouraging a rural-urban continuum.

1.9.4 PROPOSALS BY OTHER AGENCIES

1.9.4.1 NATIONAL HIGHWAYS AUTHORITY OF INDIA (NHAI)

The Jaipur Outer Ring Road (ORR) project is a transformative urban infrastructure initiative designed to encircle the city with a high-capacity expressway that alleviates traffic congestion, supports regional connectivity, and enables planned urban expansion. The project is being developed in three phases—Phases I & II (Southern Corridor) and Phase III (Northern Corridor)—with a total length of approximately 146 kilometers. The status of Phases I & II (Southern Corridor) is completed and operational and Phase III (Northern Corridor) is under planning and execution; being implemented by NHAI. The map showing the proposed Outer Ring Road is presented in **FIGURE 1.7.**

FIGURE 1.7: PROPOSALS BY NHAI



Source: NHAI

The length of Phase III (Northern Corridor) is approximately 99 km and the alignment completes the ring by connecting Delhi Road (NH-52), Sikar Road (NH-11), and back to Ajmer Road (NH-48).

The Key features of Phase III (Northern Corridor) are:

- 6-lane access-controlled expressway with 3-lane service roads on both sides.
- Proposed 135-meter Right of Way (RoW) including a commercial development corridor.
- Advanced interchanges and service infrastructure planned at major junctions.
- Land acquisition targeted in 26 villages across Amber, Jaipur, and Jamwa-Ramgarh tehsils.

The Integrated Benefits of ORR (All Phases):

- Decongestion: Diverts heavy through-traffic away from urban roads.
- Connectivity: Seamless linkage between key national highways around Jaipur.
- Urban Planning: Supports sector-based urban development and satellite townships.
- Economic Growth: Facilitates freight movement, real estate development, and commercial activities along the corridor.
- Environmental Impact: Reduces vehicle emissions and urban noise pollution.

Apart from the Ring Road, there are some grade separated facility proposals of NHAI:

- Underpass at 14 No. Road Junction
- Flyovers at Nindar, Todi Mod towards Ringus road
- Flyover at Beelwa Kalan to ease the traffic congestion near Chokhi Dhani.
- Underpass at the 200 ft Ajmer Road Junction to facilitate uninterrupted traffic movement between Mansarovar Road and Delhi Road.
- One way Flyover at the 200 ft Ajmer Road Junction to facilitate traffic movement between Ajmer Road and Delhi Road.
- Flyover is proposed at the 200 ft Ajmer Road junction to facilitate seamless traffic movement between DCM (Tagore Nagar) and the existing flyover.

1.9.4.2 TRANSPORT INFRASTRUCTURE PROPOSALS BY JDA

The ongoing and proposed infrastructure projects of JDA aims to enhance urban mobility, improve road connectivity, and facilitate smoother transportation in key areas. The significant road / infrastructure development projects have been undertaken by JDA to improve access and remove bottlenecks. The key development works, including road construction, renewal initiatives, ongoing projects, and upcoming elevated road and flyover construction are given below.

- Encroachment removal and widening of Sirsi Road (2.5 km)

- Construction of approximately 200 km of new roads in Prithviraj Nagar-Sanganer area
- Road improvement works in VKI and Vidhyadhar Nagar
- Development initiatives at Rambagh Golf Club including underground parking at High Court
- Elevated Road Proposals at following locations:
  - Arendra Bhawan to Jagatpura RoB
  - Sanganer Flyover to Chordiya Petrol Pump

These projects aim to alleviate congestion, improve traffic movement, and support long-term urban expansion. Through strategic planning and execution, the development works will significantly enhance the city's infrastructure and overall connectivity.

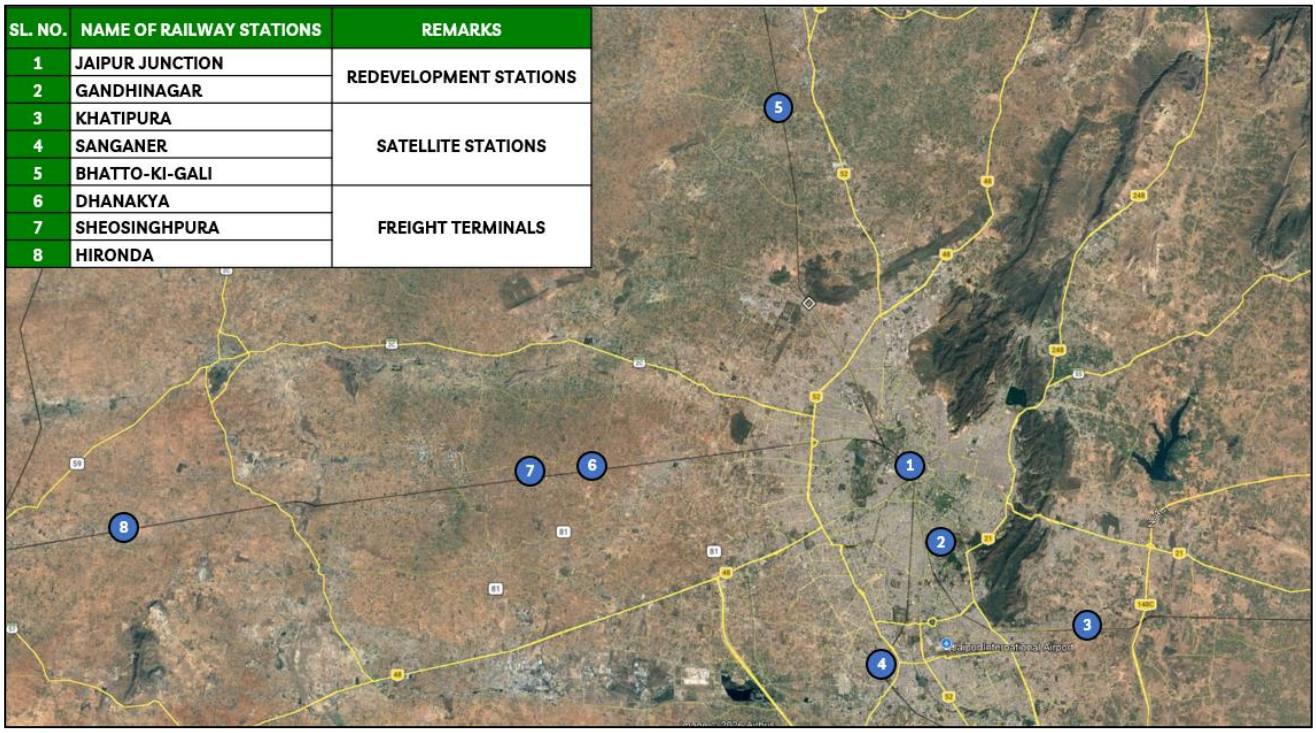
1.9.4.3 NORTH WESTERN RAILWAY

The ongoing and proposed infrastructure initiatives of North Western Railway (NWR) in Jaipur are aimed at strengthening regional connectivity, enhancing passenger convenience, and facilitating seamless integration with the city's transport network. Significant projects have been undertaken to improve access to railway stations, ease congestion around rail corridors, and eliminate level crossing bottlenecks. In addition, modernization and capacity enhancement measures such as track doubling, station redevelopment, and improved passenger amenities are being implemented. Upcoming projects also include new rail connectivity links, yard remodeling, and integrated facilities to support multimodal transport. The details of these ongoing and proposed railway development works are:

- Major upgradation works at Jaipur junction and Gandhi Nagar (Jaipur) Railway Stations of Jaipur Division to increase passenger footfall and commercial activities.
- Development of Khatipura, Sanganer and Bhatto-ki-Gali Railway Stations as satellite station with terminal facility. In the future, trains will originate and terminate at these stations, thereby facilitating the distribution of passenger traffic across multiple nodes and alleviating congestion at Jaipur Junction.
- North Western Railway (NWR) is planning the development of a new railway line from Tonk to Shivdaspura, with further connectivity proposed towards Bassi.
- A Ring Rail project around Jaipur city is presently under consideration.
- The Railways is undertaking a final location survey for the construction of a third railway line between Jaipur and Phulera, aimed at enhancing overall traffic handling capacity.

- A new greenfield freight terminal is proposed to be developed at Sheosinghpura to augment freight handling capacity. Also, new goods shed is under development at Nindar–Benar to support regional freight movement.
- Two Gati Shakti Multimodal Cargo Terminals (MMCTs) are coming up at Dhanakya and Hirnoda, which are expected to strengthen multimodal freight logistics in the region.
- Construction of Industrial sheds, other ancillary buildings in connection with developing new coach care complex at Khatipura.

FIGURE 1.8: PROPOSALS OF JAIPUR DIVISION RAILWAY STATIONS



1.9.4.4 AIRPORT AUTHORITY OF INDIA

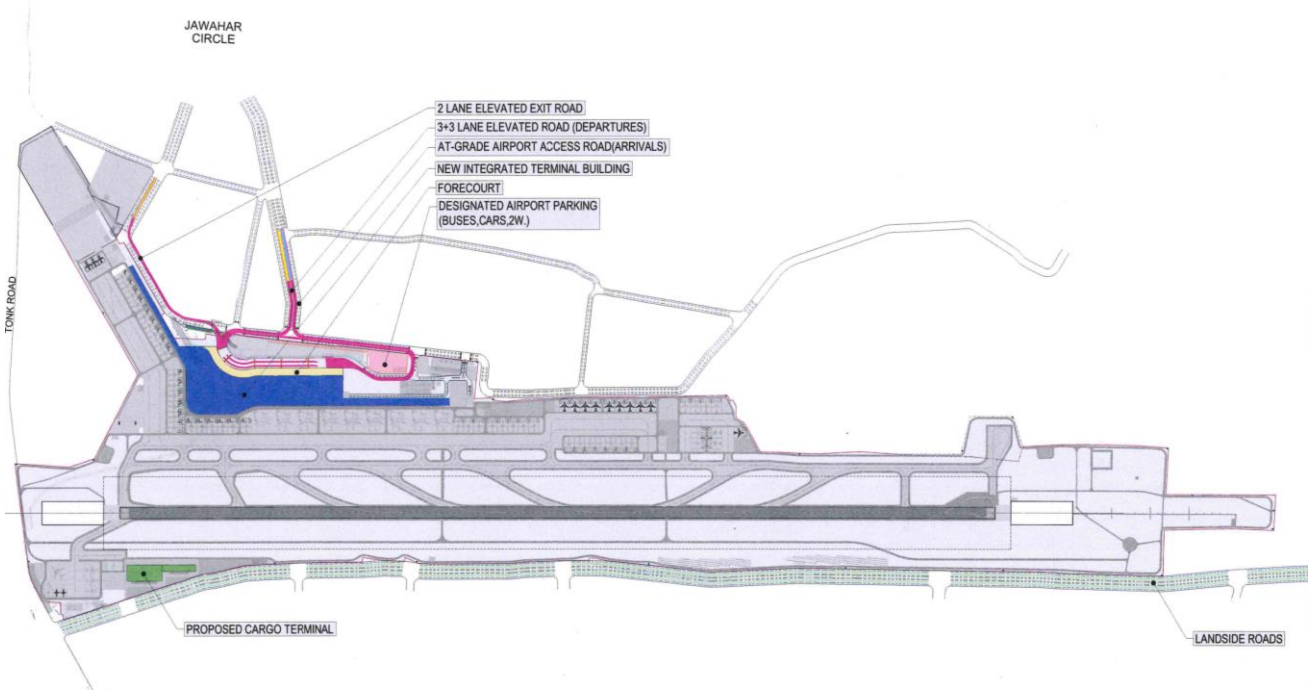
Jaipur Airport Operator has proposed New Integrated Terminal Building for improvement and enhancement of landside connectivity.

The alignment, **Figure 1.9**, indicates that provision of three-lane elevated roads on both sides, with direct up-ramp and down-ramp access, is considered appropriate to ensure smooth vehicular movement along the departure corridor and to reduce congestion on adjoining surface roads.

At the exit location, traffic dispersion has been planned towards Airport Road on the eastern side and VIP Hangar Road on the western side to facilitate balanced distribution of traffic.

The proposed alignment, shown at Figure, has been planned in compliance with applicable geometric design standards and without causing any adverse impact on the existing road network.

FIGURE 1.9: PROPOSED ELEVATED ROAD CONNECTIVITY AT AIRPORT TERMINAL



1.9.4.5 JAIPUR CITY TRANSPORT SERVICES LIMITED

Jaipur City Transport Services Limited (JCTSL) has proposed the operation of 150 electric buses (e-buses) across 17 identified routes to strengthen and modernize the city bus transport system. Of these, nine routes are planned to be operated from the Bagrana depot and eight routes from the Todi depot, allowing for efficient fleet management and balanced operational distribution. The proposed route network has been planned to cover major residential areas, commercial centres, employment hubs, and important transit corridors across Jaipur city, thereby enhancing overall public transport accessibility and connectivity.

The introduction of electric buses is expected to reduce dependence on conventional fossil-fuel-based vehicles, resulting in lower tailpipe emissions, reduced noise levels, and improved urban air quality. The proposed e-bus operations are also anticipated to improve service reliability, passenger comfort, and operational efficiency, while supporting the city's broader objectives of promoting sustainable, energy-efficient, and environmentally responsible urban transport systems. The depot oriented routes are presented in **Figure 1.10** and **Figure 1.11**.

Also, 150 new bus queue shelters are proposed by JCTSL across the city to improve passenger waiting facilities and enhance overall service quality of the city bus system. The proposed shelters are planned to be located along existing bus routes to cater high-demand boarding locations to ensure maximum passenger convenience and accessibility. The proposed bus shelters are listed at *Annexure 1.1*.

FIGURE 1.10: PROPOSED E-BUS ROUTES OF JCTSL FROM TODI DEPOT

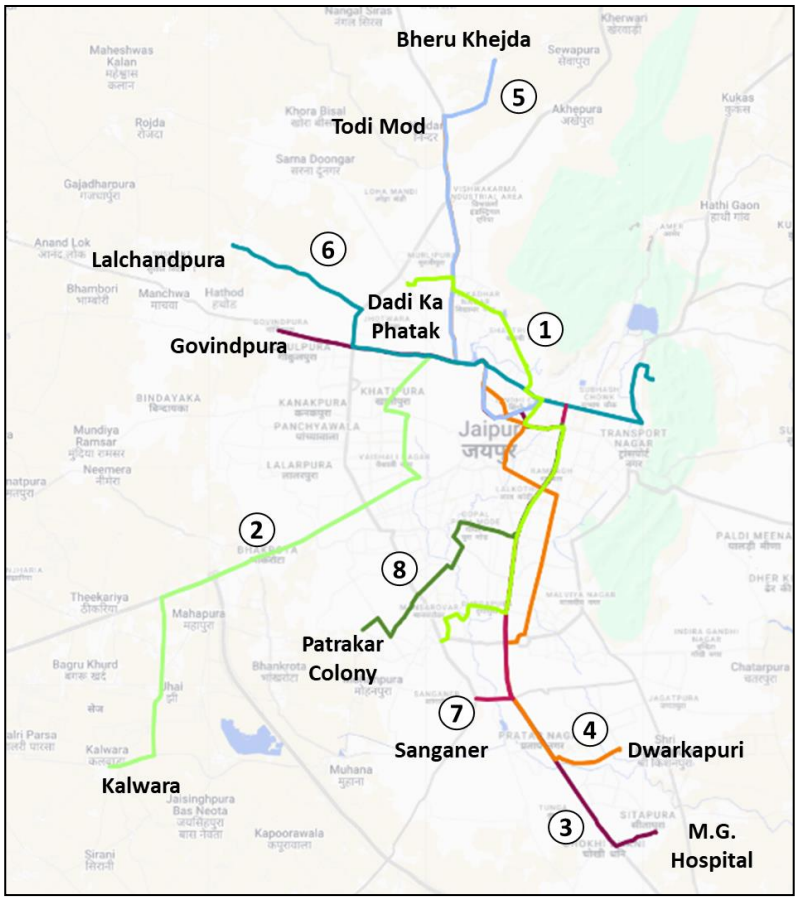
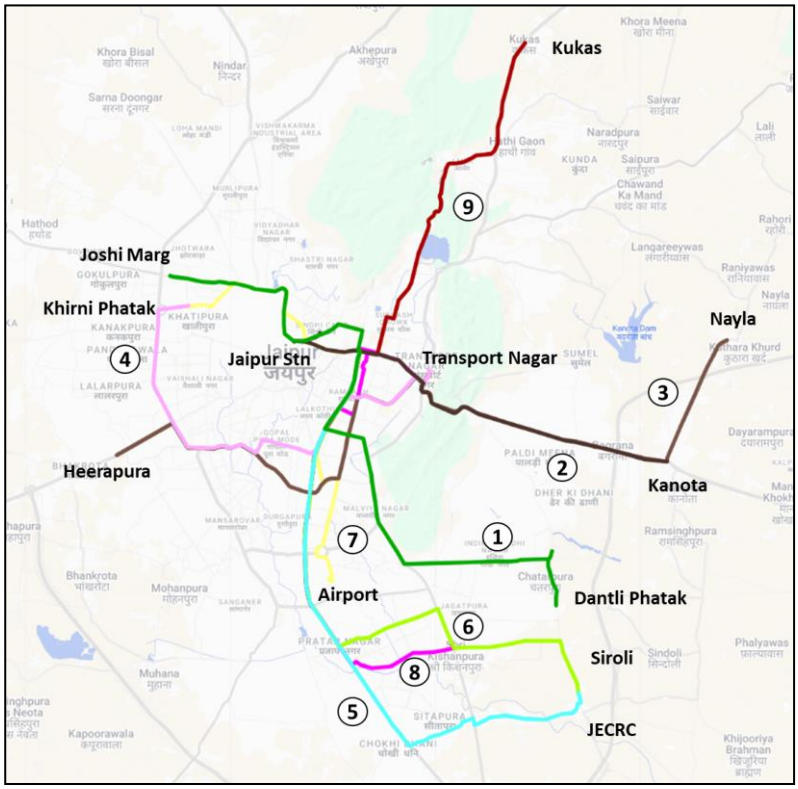


FIGURE 1.11: PROPOSED E-BUS ROUTES OF JCTSL FROM BAGRANA DEPOT



1.10 STAKEHOLDER'S CONSULTATION

City Authorities should be responsible for the implementation of various proposals as listed out in the approved CMP. During the process of the CMP preparation, a wider consultation with key stakeholders like the Development Authority, Municipal Corporation, JCTSL etc. is proposed to be carried out through various seminars and workshops to obtain feedback from the stakeholders. Following stakeholders were identified to receive their inputs and feedback time to time:

- Jaipur Development Authority
- Nagar Nigam Jaipur
- Jaipur Metro Rail Corporation Limited
- Jaipur City Transport Services Limited
- Rajasthan State Road Transport Services
- Rajasthan State Bus Terminal Development Authority
- National Highways Authority of India
- RTO Jaipur
- Traffic Police Jaipur
- Rajasthan Tourism Department
- Rajasthan Urban Infrastructure Development Project
- Airport Authority of India
- Rajasthan Housing Board
- North Western Railway, Jaipur Division

1.11 APPROACH AND METHODOLOGY

1.11.1 APPROACH



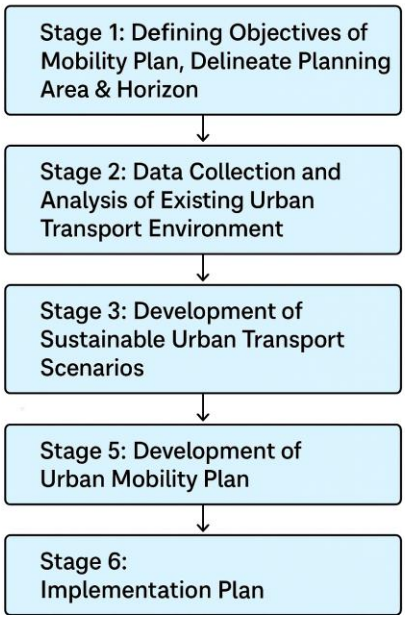
The approach adopted focused on delivering all the required objectives within the agreed scope and timeframe while maintaining professional quality meeting Client's expectations. The Comprehensive Mobility Plan (CMP) for city is being prepared within the framework as per Metro Rail Policy – 2017 issued by the Ministry of Housing and Urban Affairs (MoHUA). Our approach is collaborative and coherent to complete the study within the time limit and based on:

- A clear understanding of the project's wider objectives and the Scope of Work
- A clear understanding and appreciation of the local conditions based on site visits and previous experience in similar projects
- Rapid mobilization of suitable team of experts with proven success on other projects
- Formulation of an appropriate work plan based on understanding of the important issues and likely time requirements
- Use of effective project management and coordination systems
- Development of a close relationship with Client officials to ensure that matters are discussed openly and resolved quickly
- Establishing strong links and encouraging frequent and open communications with all concerned stakeholders, especially in relation to the finalization of the proposals.

1.11.2 METHODOLOGY

A Comprehensive Mobility Plan (CMP) is a long-term vision that develops strategies to enhance mobility options, focusing on creating an efficient, safe, and sustainable transportation network that supports economic growth and quality of life. The CMP consists of six main stages, as illustrated in **Figure 1.12.**

FIGURE 1.12: STAGES FOR CMP PREPARATION AS PER MOHUA



The detailed methodology of CMP is presented in **FIGURE 1.13.**

STAGE 1: DEFINING OBJECTIVES OF MOBILITY PLAN, DELINEATE PLANNING AREA & HORIZON

The first task in preparing the CMP document consists of defining the scope of the project. This task covers the following aspects for the CMP:

- Study Area delineation
- Planning Horizon
- Objective and Vision
- Methodology flow chart
- Stakeholder Consultations

a. Study Area Delineation

As per the CMP Guidelines, the city Master Plan should be used as a base for preparing the CMP. This is because the CMP addresses not only city transportation needs but also the needs for regional connectivity with satellite towns and other special economic zones.

b. Planning Horizon

Planning horizon for CMP is 30 years as per Metro Rail Policy Guidelines, 2017. Improvements for Short, Medium and Long terms will be proposed under the CMP for duration of 0-5 years, 5-10 years and 10-30 years respectively.

c. Objective and Vision of Mobility Plan

As an initial task, the objective has to be clearly defined. The objective for the Jaipur CMP aims at developing strategy for desirable city mobility pattern improving PT, Non-motorized vehicles and pedestrians in line with National Urban Transport Policy. CMP is a long-term vision for desirable accessibility and mobility pattern for people and goods in Jaipur to provide, safe, secure, efficient, reliable and seamless connectivity.

d. Methodology Flow Chart

Various stages for preparation of CMP as per Metro Rail Policy – 2017 by MoHUA are presented in the flow chart shown in **FIGURE 1.13**.

e. Primary Survey Plan

To better understand the existing urban transport scenario, i.e. traffic, travel, socio-economic, environmental and other characteristics of the Study area, primary field surveys have been carried out. The tentative location for various traffic and travel surveys have been planned and discussed with the client for final decision.

f. Stakeholder Consultation

Stakeholder consultation is an integral part of the Study and has been carried out at all important stages of the Study. In Stage 1 the Vision, Planning Area, Study Horizon, and Survey Locations have been finalized in consultation with the stakeholders.

SUBMISSION OF INCEPTION REPORT

All the activities/tasks listed above lead to the preparation of the Inception Report. The submission covers the following components:

i. Overall study background, Study Area, Vision & Objectives, scope of work, review of earlier studies
ii. Demographic, land use and existing transport network characteristics, city public / intermediate public transport system and reconnaissance survey of study area
iii. Study methodology to be followed for preparation of CMP
iv. Primary surveys to be carried out in the Study Area
v. Work plan to be followed for the study and way forward

STAGE 2: DATA COLLECTION AND ANALYSIS OF EXISTING URBAN TRANSPORT ENVIRONMENT

This task relates to generation of database from primary and secondary sources to appreciate the existing urban transport and environment, issues, problems and constraints. The output of the tasks provides input for subsequent stages of the study.

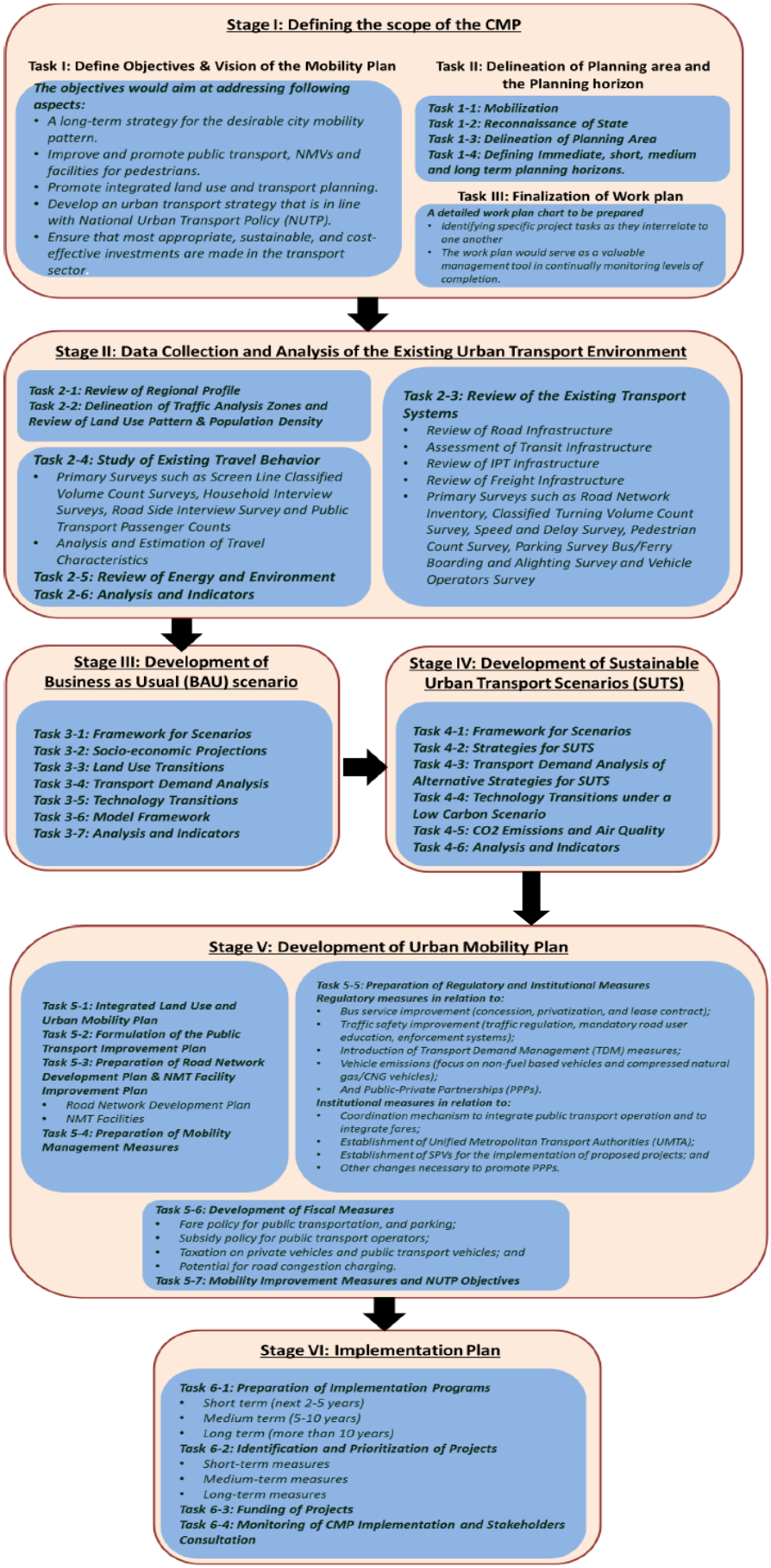
a. Review of City Profile

To study the city's present socio-economic profile and trends over a period of time, data has been collected from secondary sources on land area, administrative boundaries, demography and socio-economic characteristics. The data regarding vehicle ownership, transport network, traffic rules, guidelines & regulations and other available engineering parameters relevant to the assignment has been collected. All other relevant information related to accidents, land use planning, mapping, right of way etc. has been reviewed.

The Jaipur Development Authority has provided/facilitated the following information to the consultant regarding the developments and current status of:

- Existing GIS database
- Existing studies, reports and proposals
- Existing transport infrastructure including public transport
- Existing traffic safety and enforcement protocols
- Existing technical layouts/sections of key junctions/roundabouts and primary/secondary roads
- Accident Records
- Environmental and social condition

FIGURE 1.13: METHODOLOGY FOR COMPREHENSIVE MOBILITY PLAN



b. Delineation of Traffic Analysis Zones

For the purpose of analysis and development of travel demand forecasting model, the Study Area has been subdivided into smaller areas known as Traffic Analysis Zones (TAZs). TAZs have been delineated taking into account various factors such as administrative boundaries, physical barriers like water bodies, railway lines, highways and homogeneous land uses. TAZs located inside the study area are called internal zones whereas TAZs outside the study area are termed as external zones. Analysis of trip interactions between internal-internal, internal-external, external-external and external-internal has been taken up on the basis of these zones.

c. Review of Land Use Pattern and Population Density

A preliminary review of landuses in each TAZ has been carried out which will be linked with the data on population & employment collected as secondary data from various sources. CMP has been reled on Master Plan of Jaipur 2025 as the prime data sources for reviewing existing and proposed land-use patterns. The area of TAZs and the population figures have been used to derive the population density of each zone. The pattern of land use has been analyzed for percentage of land under each land use to arrive at ratio of residential land use and employment-generating land use, which has significant influence on travel distance and choice of walking, bicycle and public transport modes.

The review of existing land use is expected to give insight into the mode choice behavior of the city inhabitants which has been useful in formulation of future scenarios wherein changes in land uses or the densities have been suggested to alter future mode choices in favor of public transport.

As per the CMP Guidelines, land use has been clubbed under various income groups. To derive the data on income groups, sample data has been collected as part of the Household Interview Survey. Data on income groups has been linked with the data on travel patterns to establish a relationship between income and propensity to travel.

d. Review of the Existing Transport Systems

A review of existing transport infrastructure and facilities has been done for all transport modes including public / intermediate public transport (private and public), private vehicles, bus, auto rickshaw, walk, cycle, cycle rickshaw etc.

e. Preparation of Database

The data on the existing transport system has been collected from primary as well as secondary sources.

In addition to the above, primary surveys have been conducted for collection of field data. The following primary surveys have been carried out as part of the CMP study:

- Road Network Inventory Surveys (within study area - All major arterials and important sub-arterials and local streets)
- Speed and Delay Surveys – Peak hour and off-peak hour
- Classified Traffic Volume Count at Outer Cordons & Origin Destination Survey & Willingness to shift - 24 hours
- Classified Traffic Volume Count and vehicle occupancy surveys at screen lines / mid-blocks/ inner cordons – (16 hours)
- Classified Traffic Volume Count and vehicle occupancy surveys at Junctions – (16 hours)
- Pedestrian Count Surveys – (16 hours)
- Parking Surveys - 12 hours
- Fuel Station Survey
- Freight Terminal Survey
- Public Transport (Metro/Bus/Auto) Stops passengers' surveys including Opinion & Willingness to Pay Surveys
- NMT Opinion Survey
- IPT Operator Survey
- Tourist Survey
- Household Interview Survey
- Passenger Terminal Surveys – Bus, Rail & Airport – 24 hours

f. Study of Existing Travel Behaviour

Two important considerations that have been taken into account while collecting data on travel patterns are; the collected data should be representative and cover the travel behavior of all individuals within a household; and the data to be segregated by social group and trip purpose. The household survey conducted has been used to assess different social groups effectively and to represent people's perceptions towards different modes of transport in terms of time, cost, comfort, safety and security.

g. Review of Energy and Environment

In order to address the indicators of environmental impacts, i.e. the percentage of population exposed to air pollution data on ambient air quality has been collected.

The other method proposed is to overlay transport network on a grid such that emissions in a given cell has been estimated from VKM in that cell. The VKM on the transport network links has been adopted by the Travel Demand Model. The likely no. of people exposed to pollution has been estimated using density of persons in sample locations based on site reconnaissance.

By means of sample survey of vehicle users at petrol stations and secondary data from fuel suppliers as well as vehicle inventory data, the fuel consumption and energy balance has been assessed.

Emission of PM, SO2, NOx for future years has been estimated using VKM forecasted by travel demand model using the Grid Overlay Method and respective emission factors. CO2 emissions for future have been estimated using future Fuel Efficiency factors given in the tool kit.

For the base year, CO2 emissions have been estimated using coefficient as given in MoHUA Guidelines, 2017. Quantity of fuel consumed in base year and future has been estimated using respective VKM and fuel efficiency. As an alternative base year fuel consumption can also be estimated from petrol pump surveys. For future years CO2 emissions has been estimated using coefficients recommended in the UNEP report on the Low Carbon City Guidebook.

h. Service Level Benchmarks

Data collected under the above listed exercise has been collated under the specified service-level benchmarks (SLB) to understand the level of service provided to citizens of Jaipur. As presented in **FIGURE 1.14**, the SLB listed under the CMP guidelines are as follows:

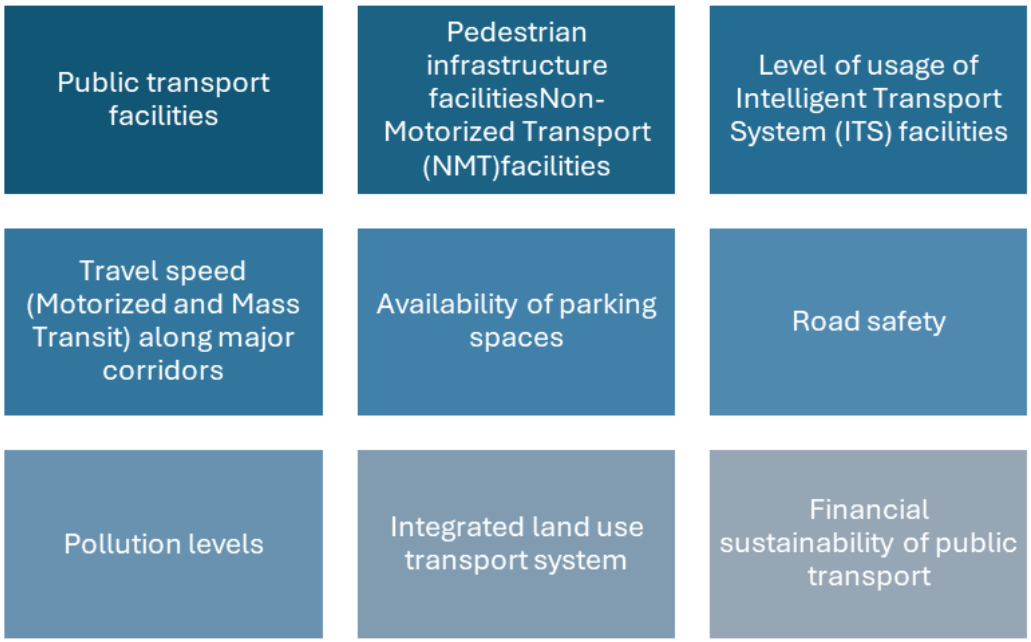
- Public Transport Facilities
- Pedestrian Infrastructure Facilities
- Non-Motorized Transport (NMT) Facilities
- Level of Usage of Intelligent Transport System (ITS) facilities
- Travel speed (motorized and mass transit) along major corridors
- Availability of Parking spaces
- Road Safety
- Pollution levels
- Integrated Land Use Transport System
- Financial Sustainability of Public Transport by bus

Benchmark Analysis and Comparison with Indicators

Transport indicators have been extracted from the data collected from primary and secondary surveys compared them with benchmarks under the SLBs listed above. The transport indicators have been broadly classified into the following categories:

- Indicators for mobility and accessibility
- Infrastructure and land use
- Safety and security
- Environmental impacts
- Economic (Response indicators)

FIGURE 1.14: SERVICE LEVEL BENCHMARKS



STAGE 3: DEVELOPMENT OF BASE & HORIZON YEAR BUSINESS AS USUAL (BAU) SCENARIOS

a. Framework for Scenario

Scenarios have been formulated to depict future growth and the needs and issues of mobility on the basis of data on traffic and travel characteristics collected through various secondary and primary surveys. Business As Usual represents the future based on the continuation of past trends and has been used as a reference point for assessing the need for policy interventions. The BAU scenario extrapolate existing trends and not assume any radical policy interventions for sustainable development and emission mitigation. However, infrastructure development and land use as depicted in the Master Plan 2025 has been considered under the BAU scenario. Future transport demand has been assessed under BAU on the basis of preferences of different socio-economic groups as revealed in the base year. In terms of passenger transport, the BAU scenario has predicted increased car ownership and higher demand for motorization. The model for BAU yield output on future transport indicators namely:

- Mobility and accessibility,
- Safety,
- Environment,
- Energy

b. Socio-Economic Projections

Demographic Projections

Demographic projections include population projections for the city along with projections of rural and urban population. The population for each TAZ estimated has been used as the basis of demographic projections.

Employment Projection

The jobs for each activity in a particular TAZ as collected, have been further projected for future years. The indicators for the BAU scenario have been analysed and compared to those estimated for the base year.

c. Land Use Transitions

The land use type has been disaggregated into residential, commercial, retail, recreational, industrial, educational, religious, and other categories. The BAU scenario considers land use pattern as proposed by the Regional Master Plan and Master Plans of cities in study area, concentrating the commercial activity in different areas of city including the core area.

d. Transport Demand Analysis

The four-step model is based on inputs of existing travel behavior obtained from the household survey, and of transport infrastructure and service quality.

Model Framework

The four-step model approach for CMP accounts for different purposes, gender and all modes of transport including NMT, intermediate public transport and public transport. RITES has used state-of-the-art software VISUM to develop the travel demand model for the Study Area. Adequate care has been taken in specifying the modeling parameters. Various stages of the modelling procedure have been explained in the following sections **FIGURE 1.15.**

The base year travel demand model replicates the road network and travel patterns of the city for testing of various short-term measures and assessing impacts of long-term proposals to be formulated. **TABLE 1.6** gives the input parameters and their data sources used for developing the base year model.

FIGURE 1.15: FOUR-STEP TRANSPORT DEMAND MODEL FRAMEWORK

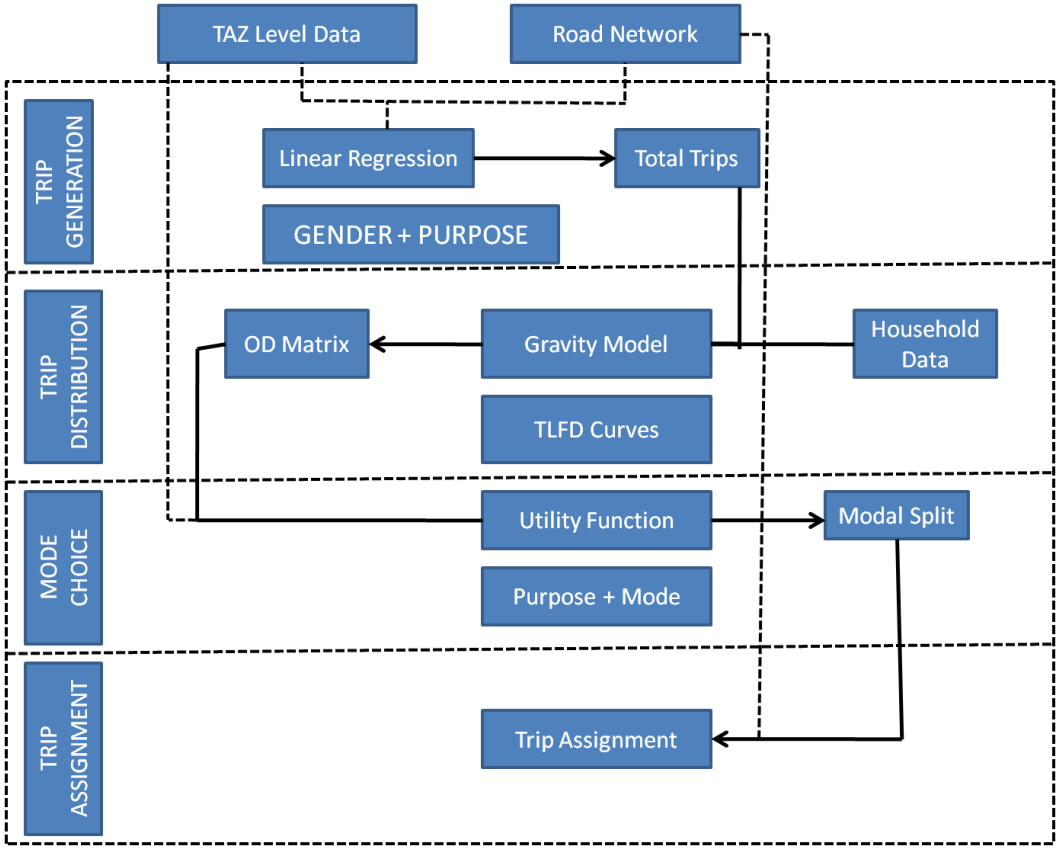


TABLE 1.6: TRANSPORT DEMAND MODEL INPUTS AND DATA SOURCE

S. No.	Model Input	Data Source
1	Traffic Analysis Zone Map	Ward Maps
2	Road Network	Data derived from Primary Surveys of Road Network Inventory and Speed and Delay
3	Trip Production Patterns	Household Interview Data and Land Use Data from Master Plan
4	Trip Attraction Patterns	Household Interview Data and Land Use Data from Master Plan
5	Trip Distribution	Household Interview data to calibrate the Gravity Model
6	Base Year Mode Shares	Household Interview Data
7	Trip Assignment	Network Calibration by Traffic Volume Counts

Trip Generation

Trip generation involves estimating the total number of trips produced and attracting each TAZ. Trip production is dependent on socio-economic characteristics of households within the TAZ while trip attraction depends on the land-use type of the TAZ as explained below:

Trip production

Household interview data has been used to estimate the trip production for various types of households using the following steps:

- Purpose-wise trips (eg., Work,
- Business, Education, Others) produced in each household derived as a function of the socio-economic attributes of the household.
- Total number of households in each TAZ derived from the census data and number of trips produced has been estimated.
- The socio-economic characteristics of each TAZ has been derived from the household Interview data.

Trip Attraction

The number of trips attracted to each TAZ has been estimated in this step. The attractiveness of a zone is a function of the type of land-use of that zone as such, residential land uses produce trips while commercial, institutional and industrial areas typically attract trips. Land use data at the city level has been derived from the Master plan of the city.

Purpose-wise trips attracted to each zone from the household interviews has been correlated with land use types in each TAZ, using multiple linear regression technique. The attractions of each zone have been scaled proportionally to the total attractions based on the total trips produced for each purpose.

Trip Distribution

Trip distribution is used to derive the Origin-Destination (OD) matrix from the Production Attraction (PA) table prepared in trip generation. Gravity Method has been adopted for trip distribution wherein trips between zone i and zone j (Tij) have been distributed in proportion to the number of trips produced in i, number of trips attracted in j and in the inverse proportion of the impedance between these zones i.e. travel time, travel cost, relative safety etc.

$Tij = Pi\ [Ai\ Fij / \Sigma Aj\ Fij]$
Where,
Tij = trips produced at I and attracted at j,
Pi = total trip production at i,
Aj = total trip production at j,
Fij = (friction factor) or computed using the TLFD curves
i = origin zone,
j = destination zone

Trip length distribution has been analyzed both purpose wise and mode wise, and the parameter found to be defining trip length distributions in greater clarity has been selected for trip distribution. The following is the step wise procedure:

- The purpose wise peak hour trips are added up to get the total trips produced and attracted to each TAZ.
- The TAZ wise mode-share values has been derived from the household interview data and applied to the production attraction table to get the mode-wise production attraction for all zones.
- Current users: The mode share of public transport and cycles in each TAZ has been derived from the household interview data and has been used to derive the peak hour production attraction table for current public transport and cycling trips.
- Potential users: All the trips in the city form the potential public transport and cycle users in the city and it is important to model these trips in parallel to estimate their potential shift to public transport and cycles respectively.
- One of the features of the four-stage demand modeling process is that only the inter-zonal trips are considered for assignment. Hence, the proportion of intra-zonal trips in each TAZ has been calculated from the household interview data and these trips has been excluded from the demand modeling process.
- The production attraction table containing inter-zonal public transport trips have been used as the input for trip distribution.

For public transport trips, the generalized cost has been considered as impedance - worked out based on time taken for access, waiting, line haul, transfer, line haul and egress, and disutility of each of these in monetary terms.

Mode Choice

Mode choice models have been developed for all modes of transport including public transport and para-transit modes. The size of TAZ has been kept accordingly to cater to walk, bicycle trips and account for impact of access/egress trips on public transport.

Mode Choice Equations: A logit model function has been run to achieve the mode choice equations. Stated mode choice has been taken as the dependent variable, whereas the socio-demographics of the individual, built form indicators (at the trip's origin and end) and travel cost have been taken as the independent variables in the equation.

Mode Choice for Walk and Bicycle: One of the major differences in modeling NMT modes as compared to motorized modes is the impact of speed on mode choice. Speed of NMT (walk and bicycle) is generally constant and there is negligible impact of congestion. While other parameters like distance to be travelled, infrastructure quality, safety and security concerns have wider impact over mode choice of walk and bicycle. Along with the mode-

related parameters individual socio-economic information needs to be accounted for modeling mode choice for NMT modes of transport.

Mode Choice for Public Transport: Utility of public transport has a minimum of three inter-related segments i.e. access trip, haul trip and egress trip. Studies have shown that access/egress trips have a significant impact over public transport as a mode choice. Accordingly, the utility function for public transport has been formulated involving waiting time and discomfort of changing modes other than mode related parameters for access/egress trip and haul trip.

Trip Assignment

This step has been performed to determine the number of trips made by different modes on each of the existing transport network link during peak and off-peak hour period. Trip assignment for NMT has accounted to land use and density parameters in the vicinity of the infrastructure/facility. The trip assignment for bicycle included parameters related to traffic volume and speed.

The person trip OD matrices for current and potential users have been converted to vehicle trips based on the average occupancy observed in each mode from the occupancy survey carried out in the city. The mode wise OD matrices from Outer Cordon survey have been added to the OD from trip distribution and mode choice steps to develop the overall OD matrix of the city.

The mode-wise calibrated OD matrices derived from the above step have been assigned on to the road network using Capacity Restraint method. Since most links are assumed to have enough capacity for cyclists and since cyclists are sensitive to safety and security issues more than speed, All or Nothing (AON) method have been adopted for cyclists. AON method has been used by considering the travel distance between ODs of the cyclists as the determining factor for route choice.

Network Validation

The link flows observed from trip assignments have been compared with the actual traffic flows observed from traffic volume counts conducted at various locations across the city. In case the observed and derived values do not match, the OD matrix has been re-calibrated till a tolerable variation is achieved. Using this procedure, the network is calibrated to match the actual volume counts observed on ground.

e. Technology Transitions

Grid emission intensity for base year and future has been taken from CMP tool kit 2014. The requirement of electrical power for charging electric road vehicles in future has been

assessed from the available secondary data. Power requirement for electric vehicles has been assumed based on factors given in Annexure 6 of CMP toolkit.

The VKM travelled and fuel consumed by petrol and diesel will change after significant increase in Electric vehicle usage in future. The expected induction of electric vehicles has been assumed based on secondary information available and the reduced quantity in VKM and fuel from petrol and diesel vehicles has been accordingly estimated and also consequent emissions has been estimated.

CO_2 Emissions and Air Quality

The framework for sustainable urban mobility has been utilized by the four strategic levers: Urban form, Non-Motorized Transport (NMT), Public Transport and Technology. The framework studies the impacts of alternative strategies using key indicators for mobility, safety, and local environment, as well as more aggregate indicators like CO^2 and energy use. The approach is to use a model framework that combines 4-stage transport model with an emission inventory and air diffusion model which then analyze the impact of activities from transport on the local environment, energy use and CO_2 emissions.

CO2 Emissions

The output from travel activity in vehicle kilometers has been used to estimate fuel consumption by using the following equation:

Fuel Consumption = Vehicle Kilometers Traveled (VKT) × Average Fuel Efficiency

VKT = Passenger Kilometer (PKM) x Average Vehicle Occupancy

The next step is to estimate the mix of vehicles in terms of their fuel usage. This mix for base year has been obtained from the sampling of vehicles during the petrol pump surveys. In the future, the fuel mix has been linked to scenario being run. The fuel use has been converted to CO^2 emissions using default coefficients for different fuels.

STAGE 4: DEVELOPMENT OF SUSTAINABLE URBAN TRANSPORT SCENARIOS

a. Framework for Scenario

The sustainable Urban Transport scenario visualises social, economic, environmental and technological changes including use of efficient fuels and vehicles and use of NMT & PT. This framework contained in the CMP tool kit is confirmed.

Identification and Quantification of Drivers

The main drivers are socio-economic projections, land use, infrastructure and policy change. The socio-economic projections in the BAU scenario have been used, however for changes in land use, infrastructures and policies need some improvement. Model framework for

Sustainable Urban Transport Scenarios, is the same as used for the Business As Usual scenario.

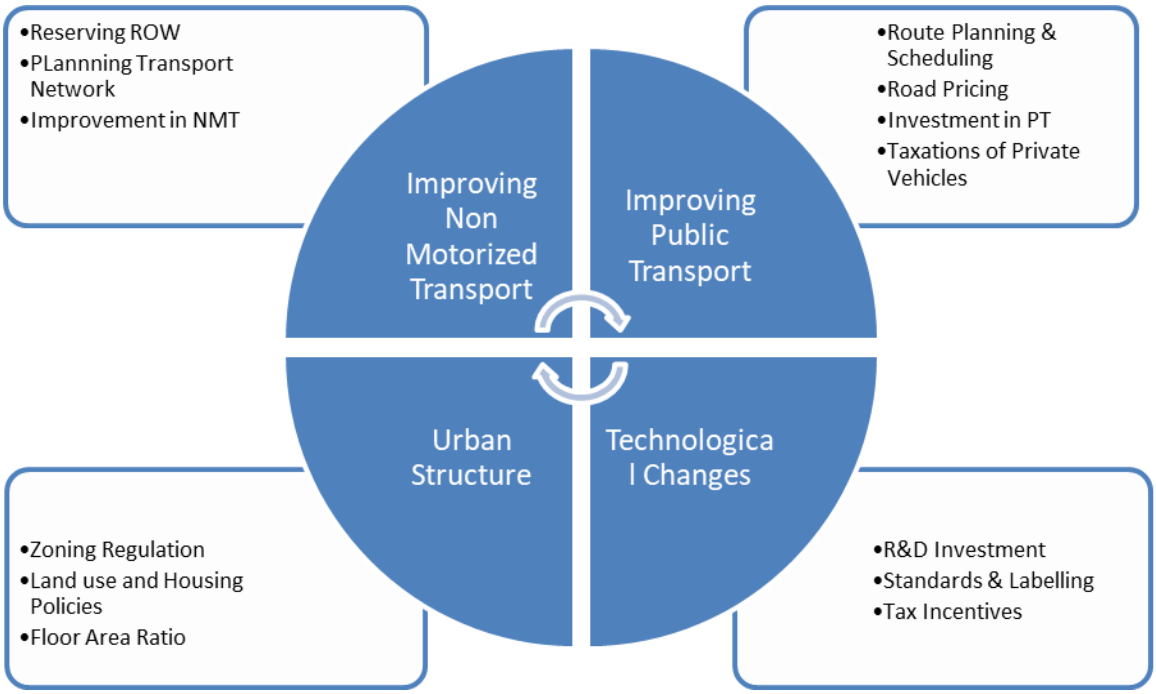
b. Strategies for Sustainable Urban Transport Scenario in Ultimate Horizon Year

Jaipur CMP identifies investment priorities to help achieve the sustainable city goals. The sustainable scenarios also assumed an increase in motorized transport to some extent, which is inevitable given the low level of vehicle use on a per capita basis. Therefore, emphasis has been placed on improving technology in terms of efficiency and emissions. Key strategies can be typically classified into four categories namely:

- Change in urban structure due to integrated landuse,
- Improving non-motorized transport,
- Improving public transport, and
- Technological changes

These strategies are essential for developing Smart Cities and delivers the full benefits if they are implemented collectively; however, for analysis it is useful to present them one by one to see the individual effect. The key strategy for sustainable scenarios is presented in **FIGURE 1.16**.

FIGURE 1.16: BROAD STRATEGIES AND ACCOMPANYING POLICIES USED FOR SUSTAINABLE SCENARIOS



A: Urban Growth / Land use Integration

Urban sprawl and uncontrolled growth of cities result in increased trip lengths, which is not a desirable scenario. The focus of the CMP will be to develop a compact city with high density and multi-nuclei development. It will help shorten trip lengths and improve access to public transport.

B: Public Transport

An assessment has been made about the quality of service of the present public transport services in Jaipur. If it is found that the city lacks a reliable bus service, a scenario of improved bus service with compatible pedestrian and bicycle infrastructure for public transport has been considered. This scenario assumes that bus infrastructure and operations are improved so that reliable bus service is available at least along all arterial roads. Stress has been given to the provision of access and egress support infrastructures for walking and bicycle. The above-mentioned changes have been used to check the stated preference mode choice of respondents in the household survey. This helped to compute the increased demand for public transport in the scenario where limitations of infrastructures (which exists in the BAU scenario) for public and non-motorized transport are removed.

C: Non-Motorized Transport Infrastructure

The scenario considers improvements in NMT user experience by enhancing footpaths and bicycle lanes. It also addresses improvement in safety and accessibility for pedestrians and bicycles at intersections. Reducing barriers and impediments on roads to improve bicycle safety is another aspect considered under the scenario. Reduced conflicts between NMT users and buses on roads also result in an increase in bus speed.

D: Improving Public Transport, NMT and Urban Structure

This scenario looks at how the implementation of NMT, public transport and urban structure strategies combine and complement each other.

E: Technology

Technology changes will encompass changes in vehicles design, fuels use, energy use and reduction in CO2 emissions related to electrically driven vehicles based on central / state policies.

The VKM travelled and fuel consumed by petrol and diesel will change after significant increase in Electric vehicle usage in future. The expected induction of electric vehicles has been assumed based on secondary information available and the reduced quantity in VKM

and fuel from petrol and diesel vehicles have been accordingly estimated and also consequent emissions have been estimated.

F: Regulatory and Financial Measures (Incentives and Disincentives)

Regulatory and financial measures are undertaken to promote the shifting of people from private transport modes to sustainable urban transport. These measures will internalize the cost of externalities imposed by private vehicles in the form of parking policies, congestion pricing and carbon-taxes by central / state decisions. These have been incorporated in the model in the form of increased generalized cost of travel by private modes.

Based on above strategies, the likely sustainable urban transport scenarios which have been developed for the ultimate horizon year are as under –

- BAU+LU (Business as Usual + Landuse) - In this scenario an alternative pattern of city growth in terms of land use parameters is envisaged.
- BAU+LU+PT (Business as Usual + Landuse + Public Transport) - In this scenario a PT system is introduced to reduce the private vehicle trips and carbon footprints
- BAU+LU+PT+NMT (Business as Usual + Land use + Public Transport + Non-Motorised Transport) - In addition to above, a safer walking and cycling infrastructure is recommended to be provided in this scenario
- BAU+LU+PT+NMT+Technology (Business as Usual + Land use + Public Transport + Non-Motorised Transport + Technology) - This scenario shall explain the likely impact of improving future vehicle and fuel technologies in the transport system. In addition some regulatory measures could also be introduced.

c. Demand Analysis of Sustainable Urban Transport Scenarios

The aim of the above scenarios is to improve transport infrastructure and increase the cost of using personal motorized vehicles. The method used to estimate travel demand for different modes under alternative scenarios is given below:

Repeating a four-step model

In this method, a four-step modeling is repeated, taking into account changes in parameters associated with different modes such as cost, travel time, availability, comfort and safety. These changes result in a changed impedance to different modes and consequently, changes in people's transport choices.

FIGURE 1.17: SUSTAINABLE URBAN TRANSPORT SCENARIOS

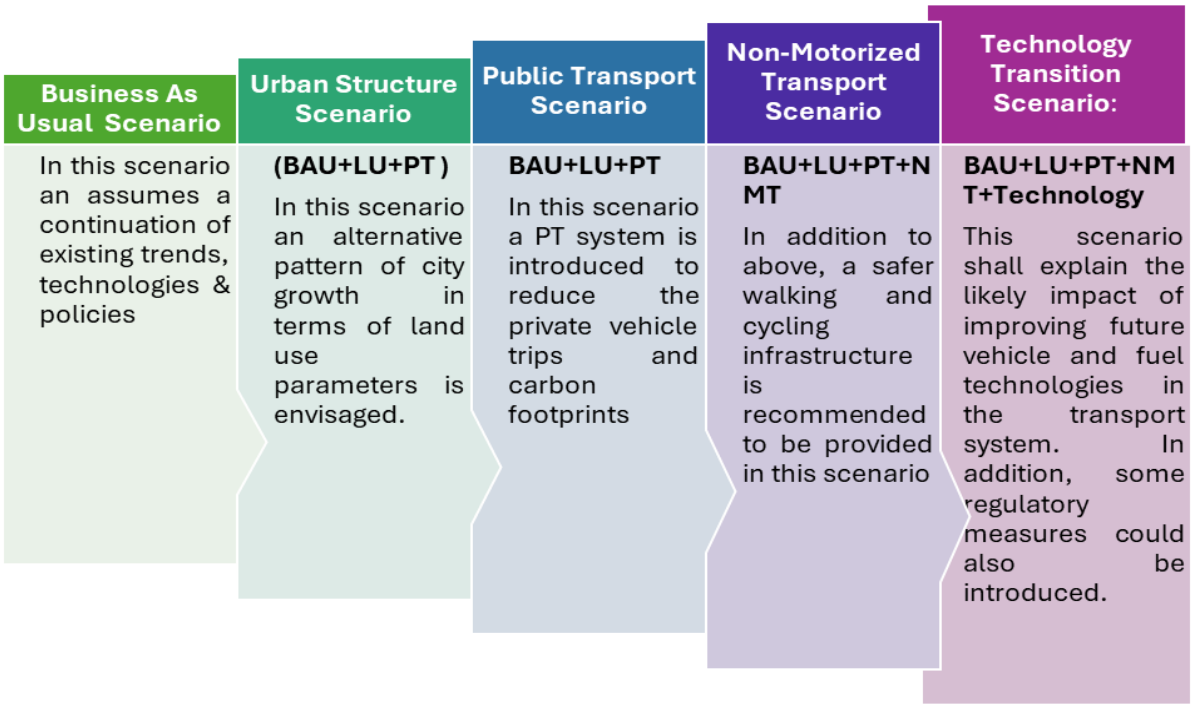


TABLE 1.7: DIFFERENCES IN FOUR STEP MODEL FOR ALTERNATIVE SCENARIOS

	Change Due to	Urban Structure	NMT Infrastructure	Public Transport	Technology	Regulatory & Financial Measures
Trip Production	Age-sex distribution and population growth	Population distribution in city				
Trip distribution	Change in land use parameters and change in impedance for different modes	Distribution of activities (Residential, commercial and industrial)		Change in impedance (Travel time, travel cost, accessibility and reliability)		
Mode choice	Change in impedance and trip length		Change in impedance (Bicycle Compatibility • Index and • similar for • pedestrians)		Change in travel cost	Change in travel cost by different Traffic modes
Trip assignment	Change in impedance					

d. Technology Transitions under a Low Carbon Scenario

One of the strategies for sustainable Urban Transport is technology changes encompasses changes in vehicle design, fuel use, energy use and reduction in CO2 emission related to electricity.



Decrease in CO2 emissions from fossil fuel vehicles and increase in Grid emissions – both resulting from increased use of electric vehicles will be estimated. The decrease in emissions due to use of improved fuel and vehicle efficiency is already reflected in emission factors of Annexure 6 of CMP toolkit.

e. CO2 Emissions and Air Quality

The model framework for sustainable urban transport scenarios will be same as the BAU scenario for estimating CO2 emissions and air quality.

f. Analysis and Indicators (Comparison with Benchmarks)

The indicators for the sustainable urban transport scenario have been selected from the indicators estimated for the base year. All the indicators of base year are not evaluated as it is difficult to predict the future on the basis of some of the indicators listed under base scenario.

SUBMISSION OF INTERIM REPORT

The Interim Report cover Stage 2 and 3 including Evaluation of Existing Urban Transport Characteristics, Service Level Benchmarks, Development of Business-as-Usual Scenarios and Sustainable Urban Transport Scenarios and Way forward.

STAGE 5: DEVELOPMENT OF URBAN MOBILITY PLAN

Based on the analysis of existing urban transport, BAU scenario, preferred land use and transport scenario, vision and strategy for development, urban mobility plan for the city have been prepared. The mobility plan provides alternatives to enhance mobility for all users and all modes of travel. If possible, the urban mobility plan suggests the changes in the existing urban structure and form that encourages an increased use of public transport, walking and NMT.

The mobility plan will be the city's long-term blueprint for improving accessibility and mobility. The aim of the mobility plan is to develop an adequate, safe, environmentally friendly, affordable, equitable, comfortable, efficient integrated transport system within the

framework of a progressive and competitive market economy. It attempts to create a well-connected network of complete road hierarchy, suggest measures to shift from unsustainable mobility to sustainable modes and integrate freight planning with urban transport.

The CMP aims to plan for the people rather than vehicles by providing sustainable mobility and accessibility for all citizens to jobs, education, social services and recreation at an affordable cost and within reasonable time. The plan has been defined along the following lines:

a. Integrated Land Use and Urban Mobility Plan

National Urban Transport Policy (NUTP) has emphasized the integrated land use and transport planning. Urban structure determines the travel demand and transport system influences the urban structure. Location of various land uses and activity nodes have influence on travel patterns. At the same time, the transport nodes or hub impact the allocation of land use both at the city and local level. As such, integrating urban development with transport is the key consideration towards compact and sustainable development of cities. Thus, elements for land use transport integration would be as follows:

- Enabling urban structure
- Completing the hierarchy of roads
- Aligning public transit with high density areas, mixed land use to capture the land value
- Integrating multimodal transit interchange and planning integration at vertical and horizontal level

Integrating land use with the urban mobility plan would entail a two-way interaction between the two plans. High density residential areas intertwined with high density employment areas, along with increased travel costs and an efficient public transport system incites the people to use NMT for short trips and public transport for long ones. The land use has been allocated in a manner that encourages short and fewer trips, thereby enabling improved accessibility to activities. This will also help people shift from private travel modes such as cars to NMT (including cycling and walking).

Additionally, to encourage NMT, neighbourhood design measures such as pedestrian footpaths and cycling tracks have been proposed. To summarize, the land use plan locates the activities in a manner that encourages low-carbon mobility and the urban mobility plan, in turn, will facilitate access to activities.

b. Formulation of the Public Transport Improvement Plan

Public Transport Improvement Plans have been divided into a number of sections, including service improvements for buses and paratransit, appropriate MRT options and infrastructure development plans and intermodal integration plans.



Improving the public transport involves infrastructural improvements like reserving lanes and tracks and improvement in level of service to not only maintain the existing modal share of public transport but also create a shift from other modes to public transport. A progression towards public transport technology has been suggested from the low-carbon point of view. System planning considers not only where terminal, routes and stops are placed (i.e. routes and stops), but also consider the aspect of accessibility for pedestrians, cyclists, differently abled, elderly people, and private vehicle users availing park and ride facilities.

c. Preparation of Road Network Development Plan and NMT Facility Improvement Plan

CMP list out road projects which need to be developed, strengthened, upgraded and interconnected including hierarchical road network, arterial road construction / widening projects, secondary road construction / widening projects, intersection improvement projects, flyover projects, railway over bridge or underpass projects. The hierarchical road network is based on travel demand. The road network development plan includes inter-city connectivity between Jaipur and other cities and also consider the connectivity within Jaipur. In addition to assigning hierarchy to the road network derived from its land use, urban roads have been assigned functions as streets. As the availability of additional road capacity often induces new travel, the induced demand has been considered for project cost and benefit.

As per the MoHUA guidelines, despite the latent demand for motorized vehicle use, proposals to improve motorized vehicle mobility by increasing road space under the pretext of easing congestion have been discouraged as much as possible. New construction/ widening projects, flyover projects and underpass projects have also been discouraged.

As a large proportion of urban travel involves using NMT modes, specific streets and street types have been identified which are preferred by individuals when walking or using a bicycle. Due consideration is given for forming a network of NMT. An attempt has been made to ensure that all roads where individuals are likely to walk should include at least 2 meters of clear, walkable footpath, all potential walking or bicycling locations should have

NMT infrastructure, including comfortable footpaths, cycle tracks, streetlights, cycle stand, formal pedestrian crossing and NMT-designed signals at all junctions.

NMT improvement plans and traffic management measures have been worked out for CBD, commercial centers, and other major activity centers. Traffic management for major activity centers and city level infrastructure planning for pedestrians and cyclists have been taken up.

d. Mobility Management Measures

Traffic management plans cover the parking management plans, traffic control measures, intermodal facilities, demand management measures, traffic safety plan and ITS based measures. Mobility management measures have been suggested in the CMP to enable enhanced use of public transit and NMT modes. Additional measures have been added to increase the cost of using personal motorized travel, including the taxation of cars and fuel, land use planning that encourages shorter travel distances and traffic management by reallocating space on the roads.

e. Regulatory and Institutional Measures

Effective development of urban land use and transport systems often requires regulatory and institutional changes. Such requirements have been suggested in the CMP. These measures can be developed region-wide/ city wide or be project specific. The regulatory and institutional plan include the following:

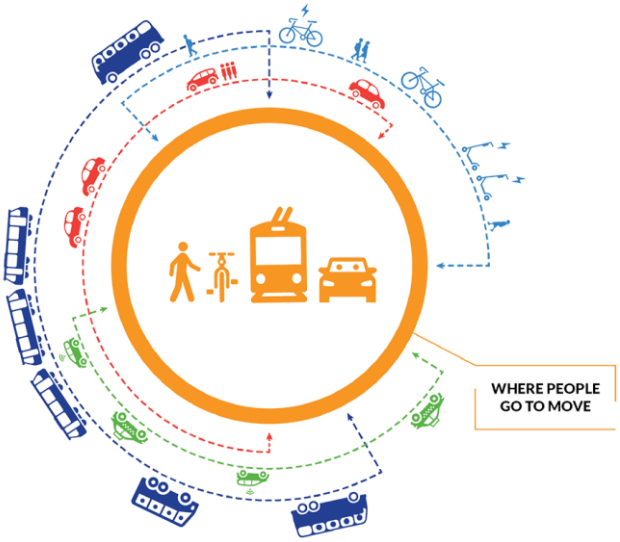
Regulatory measures in relation to:

- Bus service improvement (concession, privatization, and lease contract);
- Traffic safety improvement (traffic regulation, mandatory road user education, enforcement systems);
- Introduction of Transport Demand Management (TDM) measures;
- Vehicle emissions (focus on non-fuel based vehicles and compressed natural gas/CNG vehicles);
- Public-Private Partnerships (PPPs).
- Institutional measures in relation to:
- Coordination mechanism to integrate public transport operation and to integrate fares;
- Establishment of Unified Metropolitan Transport Authorities (UMTA); if not in place earlier
- Establishment of SPVs for the implementation of proposed projects; and other changes necessary to promote PPPs.

f. Development of Fiscal Measures

Fiscal measures are also considered to achieve a balanced modal split, and to secure the budget necessary to implement urban transport projects. As fiscal measures usually correspond to institutional and regulatory measures, the following aspects have been examined:

- Fare policy for public transportation, and parking;
- Potential for road congestion charging.



g. Mobility Improvement Measures and NUTP Objectives

The land use and transport measures proposed in the CMP improves the mobility in the study area and cover the critical issues addressed in the NUTP. A table have been prepared summarizing the relationship between the NUTP objectives and the measures proposed in the study, together with a classification of the measures according to their implementation timeframe (immediate, short, medium and long term) as per the provision of NUTP.

STAGE 6: IMPLEMENTATION PLAN

a. Preparation of Implementation Programs

CMP provide broad guidelines prioritizing various projects for the measures identified into the following categories:

- Immediate priority / actions (0 - 2 years)
- Short term (2-5 years)
- Medium term (5-10 years)
- Long term (more than 10 years)

All the projects have been presented to the city stakeholders and the implementing agencies to identify the priority of the projects. The project list is merely a description of priority projects whereas detailed project reports (DPR) with cost estimates and financing will have to be prepared by the city authorities separately and approved by the urban local body and state government before seeking funding from the MoHUA or any other agency.

b. Identification and Prioritization of Projects

All sustainable transport projects have equal priority however their planning can be phased based on short, medium and long-term planning. The prioritization of projects into short, medium and long term has been done using the following criteria:

- Immediate and short-term measures aimed at improving the safety and accessibility of pedestrians, cyclists and public transport users, area level traffic circulation plans and measures like implementing traffic signals.
- Medium-term measures typically involve the corridor-level projects such as implementing cycle tracks and mass-transit corridors, city level initiatives like public transport fleet improvement and efficient scheduling, developing area level cycle networks and Public Bicycle Sharing (PBS) schemes, parking policy development and implementation in the city. They are primarily aimed at halting the decrease in the city's public transport and non-motorized transport mode shares.
- Long-term measures include implementing the overall vision of the CMP. This includes developing city-level networks for walking and cycling, bus systems, mass-transit networks, parking regulation measures and pricing strategies as a demand management tool, improving the overall road network to provide adequate accessibility for existing developed areas and new ones as the city grows, centralized control measures for traffic signal systems and public transport operations

An additional set of criteria for prioritizing projects can be as follows:

- Balance between improving existing infrastructure and creating new infrastructure in upcoming areas of development (Preference can be given to projects that improve existing infrastructure by giving them higher scores)
- Benefits measured in terms of mobility and accessibility, safety, energy, environment and CO2 mitigation.

These project ideas have been presented to the stakeholders in order to get feedback on both the projects and their prioritization. Multi Criteria Assessment (MCA) techniques have been used to evaluate alternative options using stakeholder feedback. The final list of identified projects will then undergo studies on implementation, cost estimates and likely funding agencies.

Alternative and innovative sources of various project-funding options have been identified to reduce the investment by various Government agencies.

c. Monitoring of CMP Implementation

CMP is the basis for approving projects, plans and various regulatory measures within the city related to transport and it is therefore important to monitor and measure the impact of interventions. Agencies responsible for implementation of the projects and monitoring the progress of implementation of urban transport projects have been identified. Training and knowledge transfer to the concerned Agencies have been ensured.

SUBMISSION OF DRAFT FINAL CMP REPORT

All the activities under Stage 5 & 6 listed above are covered in the preparation of Draft Final CMP Report. The Report include all the medium- and long-term measures along with immediate/ short-term measures.

Stakeholders Consultation

Stakeholders' consultation will be conducted after the submission of Draft Final CMP. The comments/ suggestions received in the Stakeholder consultation will be incorporated and the Final CMP Report will be submitted.

SUBMISSION OF FINAL CMP REPORT

Final CMP Report will be submitted within one month after comments and suggestions on Draft Final CMP report received from the client/stakeholder.

1.12 COMPOSITION OF REPORT

This 'Draft CMP Report' has five chapters covering the following topics:

Chapter 1 gives the study background, study area, vision & objectives, review of past studies, approach and methodology.

Chapter 2 presents the review of the city profile, primary traffic & travel surveys and their data analysis along with service level benchmarking indicators.

Chapter 3 gives the development of Business as Usual (BAU) Scenarios and Sustainable Urban Transport Scenarios.

Chapter 4 presents the development of the Comprehensive Mobility Plan including various proposals.

Chapter 5 gives the Implementation Plan for identified proposals.

CHAPTER – 2
REVIEW OF CITY PROFILE

2. REVIEW OF CITY PROFILE

2.1. REVIEW OF EXISTING TRANSPORT SYSTEM

Increase in vehicular traffic and limited augmentation in road infrastructure & transport facilities have been observed in the recent past. Private traffic modes have gained more usage among the commuters due to limited public transport (PT) /intermediate public transport (IPT) facilities with poor level of service. In this order, the assessment of existing transportation infrastructure in the city has been carried out.

2.1.1. TRANSPORT NETWORK AND LINKAGES

a) Road Network / Transport

Jaipur is located on National Highway 48 (Old NH-8) connecting Delhi and Chennai. This is part of the Golden Quadrilateral project which connects four metropolitans Delhi, Mumbai, Chennai and Kolkata. National Highway 52 (Old NH-12) links Sangrur, Punjab with Ankola, Karnataka through Jaipur and National Highway 21 (Old NH-11) links Jaipur with Agra passing through Jaipur. RSRTC operates a bus service to major cities in and out of Rajasthan like Delhi, Agra, Jodhpur, Udaipur, Ahmedabad etc. City buses are operated by Jaipur City Transport Services Limited (JCTSL). The road network map is shown in **Figure 2.1.**

The State Highways passing through the study area that provides connectivity at the State level are given below:

- SH-2C (Kalwar Road)
- SH-12 (Diggi Malpura Road)
- SH-55 (Jamwa Ramgarh Road)
- SH-19 (Jahota Morija Road)
- SH-37 (Chomu-Churu Road)
- SH-24 (Toonga Road)
- SH-52 (Alwar Road)

Regional Connectivity - Major Cordon Roads

- Connected with towns like Chomu, Sikar, Bikaner, Churu via NH-52 (Sikar Road) in the north
- Connected with towns like Chaksu, Tonk via NH-52 (Tonk road) in the south
- Connected with towns like Ajmer, Kishangarh via NH-48 (Ajmer Road) in the west

- Connected with towns like Dausa, Mahwa via NH-21 (Agra Road) in the east

Regional Connectivity - Other Cordon Roads

- Places like Kalwar and Jobner are connected through SH-2C
- Phagi, Diggi, Malpura are connected via SH-12
- Alwar is connected by two roads i.e., via SH-52 and SH-55
- SH-37 connects Chomu with Shahpura while SH-19 connects Chomu with Kuchaman City, these roads further joins NH-52 (Sikar road)
- SH-24 connects Bassi with Sawai Madhopur and the road further joins NH-21 (Agra Road)

Connectivity with Satellite Towns and Growth Centres

- Kanota, Bassi are connected with Jaipur by NH-21 (Agra side)
- Vatika and Shivdaspura are connected by NH-52 (Tonk side)
- Jahota, Chomu are connected by NH-52 (Sikar side)
- Bagru is connected through NH-48 (Ajmer side)
- Kalwar and Pachar are connected via SH-2C
- Chonp, Bagwara are connected via NH-48 (Delhi side)
- Kukas, Bhanpur Kalan, Achrol are connected via NH-248 (Delhi side)
- Jamwa Ramgarh is connected through SH-55

b) Rail

Jaipur is the headquarters of north-western zone of the Indian Railways. The city is well connected by railways to the neighbouring cities like Delhi, Agra, and Ahmedabad as well as to the major cities in the country. Majorly four rail routes exists which are towards Sikar, Delhi, Swai Madhopur and Ajmer. Jaipur Junction is the major terminal within the study area and is regarded as the busiest one in the state of Rajasthan. Some of the other railway stations within the study area are:

- Towards Ajmer - Kanakpura, Bindayaka and Dhankya
- Towards Sikar - Dher Ka Balaji, Nindar, Batonki Gali and Chomu
- Towards Delhi - Gandhi Nagar, Jagatpura, Khatipura, Kanota and Bassi
- Towards Sawai Madhopur - Bais Godam, Durgapura, Sanganer, Goner and Shivdaspura

The rail network is shown in **FIGURE 2.2.**

FIGURE 2.1: REGIONAL ROAD NETWORK OF JAIPUR

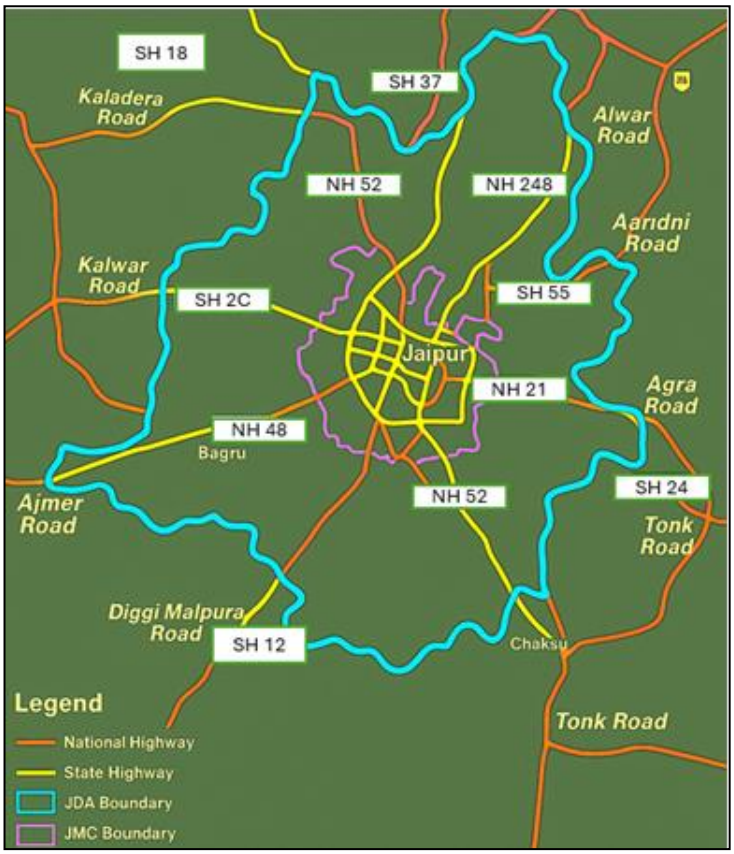
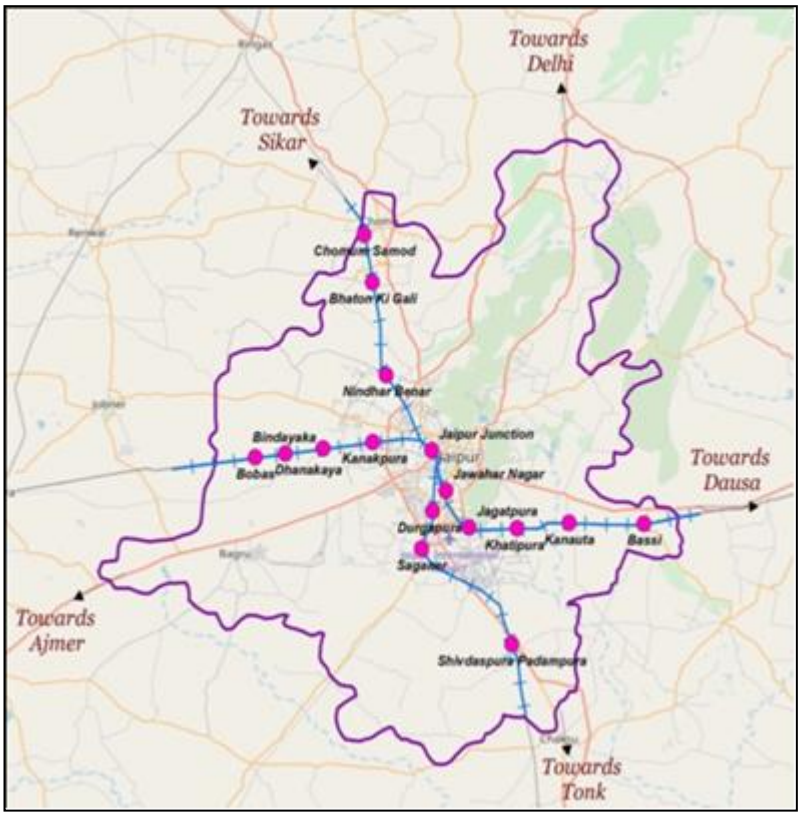


FIGURE 2.2: RAIL NETWORK OF JAIPUR CITY



c) Air

The city of Jaipur is well connected by air to various metropolitan cities like Delhi, Mumbai, Bangalore, Chennai and Kolkata as well as the other major cities in India and also connected to various major cities in the world. Jaipur International Airport is located in Sanganer, around 13 km from the city core. The airport consists of 2 Passengers terminals and a cargo terminal. The airport handled 5.46 million passengers in the year 2024-25.

d) Bus Transport

Jaipur's bus transport system is comprehensive and efficiently managed, offering extensive connectivity within the city and to various destinations across Rajasthan and neighbouring states. Major bus terminals such as the Sindhi Camp Bus Stand, Narayan Singh Circle, and Vaishali Nagar Bus Stand serve as key transit hubs. The Rajasthan State Road Transport Corporation (RSRTC) operates a wide network of buses, ranging from ordinary to deluxe and Volvo services. Regular buses connect Jaipur to major cities including Delhi, Ajmer, Udaipur, Jodhpur, Kota, and Bikaner, as well as to inter-state destinations like Agra and Chandigarh. Complemented by numerous private operators, the system ensures frequent, reliable, and affordable transport options for both daily commuters and long-distance travelers.

2.1.2. EXISTING PUBLIC TRANSPORT SYSTEM

a) Existing Bus System

The city public transport system in Jaipur consists of government buses, minibuses, and metro. The government buses are being operated by Jaipur City Transport Services Limited (JCTSL) on contractual basis with RSRTC and private operators whereas minibuses are being operated by only private agencies. Jaipur Metro is operated by Jaipur Metro Rail Corporation Limited. The existing city public transport comprises of both JCTSL buses (procured under JnNURM) and unorganized private minibuses operated by various private operators.

A total of 200 buses are running in the city by JCTSL over 26 approved routes (Todi Depot: 12 routes, Bagrana Depot: 14 routes). *Details of operational routes of JCTSL is attached in* ***Annexure 2.1.*** To enhance passenger comfort, 61 air-conditioned buses are in operation alongside 129 non-AC buses, with an additional provision of 10 spare buses to address potential breakdowns. The average daily ridership of JCTSL buses is about 1.3 Lakhs. The fare structure ranges from ₹10 to ₹60 for non-AC buses and ₹15 to ₹70 for AC buses depending on distance traveled. Detailed fare structure is presented in **Table 2.1** below.

TABLE 2.1: FARE STRUCTURE FOR JSTSL BUS

Distance (km)	Non-AC Fare (₹)	AC Fare (₹)
0–3	10	15
4–6	15	20
7–12	20	25
13–15	25	30
16–20	30	40
21–24	35	45
25–30	40	50
31–35	45	65
36–45	50	70
Above 45	55–60	–

Most city buses operate at frequencies between 12 to 45 minutes, ensuring adequate connectivity across key corridors. Bus shelters are provided on arterial routes including Tonk Road, JLN Marg, and BRTS corridors such as Sikar Road, Ajmer Road, and 200-feet Bypass Road.

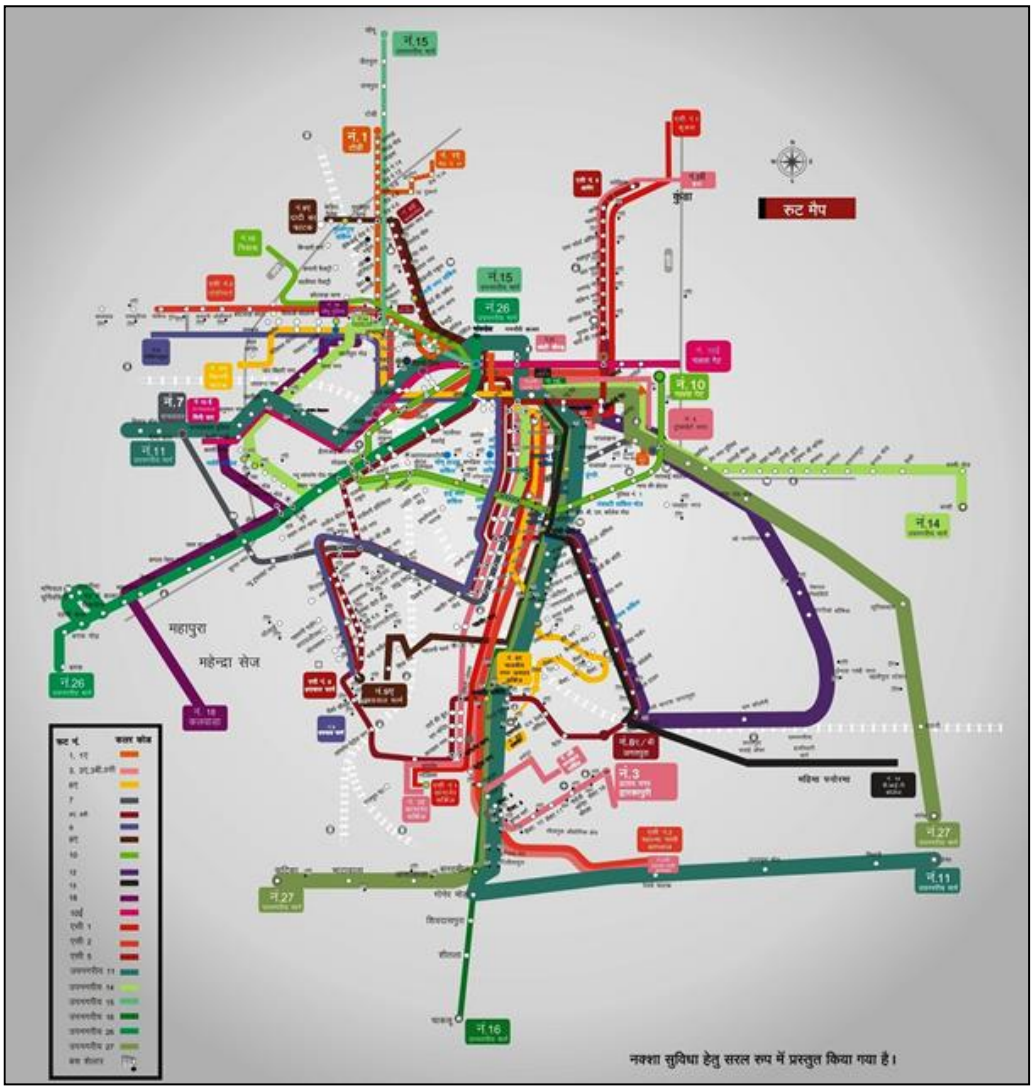
The majority buses are available with frequency of 12 to 45 minutes. Other than the JCTSL bus services, estimates indicate that about 2,300 minibuses are plying through the city roads by private operators. Bus shelters are available along major roads like Tonk Road, JLN Marg and along BRTS corridors (i.e., Sikar Road, Ajmer Road and 200 feet Bypass Road). The details of various bus terminals and depots existing in the study area for intra-city public transport are given in **TABLE 2.2**. The route map of JCTSL Buses is presented in **FIGURE 2.3**.

TABLE 2.2: DETAILS OF INTRA-CITY BUS TERMINALS AND DEPOTS

NAME	INTRA-CITY STOP	INTRA-CITY DEPOT
Sindhi Camp	✓ (On-Street)	×
Sanganer	✓ (On-Street)	✓
Todi		✓
Transport Nagar	✓ On-Street)	×
Bagrana	×	✓

The existing intra-city public transport infrastructure includes bus fleet, bus shelters and bus depots. There is no dedicated terminal facility available for the intra-city public transport (i.e., for both JCTSL and mini-bus services) in the study area. Hence, these buses are parked along the roads outside Sindhi camp, Sanganer, Transport Nagar etc., resulting in traffic congestion.

FIGURE 2.3: ROUTE MAP OF JCTSL BUSES



Private Minibus Routes

In addition to the public bus system operated by JCTSL, Jaipur's public transport ecosystem includes a network of privately-operated minibuses, which play a critical role in serving underserved and peripheral areas of the city. These minibuses are managed entirely by private operators and function as supplementary modes to the formal public transit system.

Minibus routes operate across Jaipur, connecting major residential zones, peripheral colonies, and commercial hubs with key city centers, intermodal hubs, and market areas. These routes help bridge transit gaps where public bus and metro coverage is either limited or absent.

Table 2.3 provides an overview of the prominent minibus routes operating in Jaipur.

TABLE 2.3: OPERATIONAL MINIBUS ROUTES IN JAIPUR

ROUTE NO.	ORIGIN	DESTINATION
1	Chungi Naka (Delhi Road)	NRI Circle (Pratap Nagar)
2	Jaisinghpura Khor	Jaipur Junction
7	Kundanpura (Ghati Karolan)	Hathoj
8	Malviya Nagar	Bhakrota
9B	Mundiya Ramsar (Sirsi Road)	Amer - Naradpura
11	Beelwa	Dadi ka Phatak
13	Luniyawas (Paldi Meena)	Muhana Mandi (Hajiwala)
14	Chomu Pulia (Sikar Road)	Bassi
15	Kanauta	Harmada
16	Amer Kunda	Dadi ka Phatak
17	Aakeda Road (VKI)	Jagatpura
21	Pashu Hatwada	Panchyawala
22	Jaisinghpura Khor	NRI Circle
23	Ajmeri Gate	Amer Kunda
28	Transport Nagar	Muhana Mandi
29	Bhakrota	Kunda (Amer)
30	Paldi Meena	Khora Bisal
31	Jhotwara	Vidhyadhar Nagar
32	Kachi Basti (Jagatpura)	Hathoj
34	Harmada	Jhotwara
36	Ghat Gate	Jagatpura Phatak
55	Sitapura	VKI Road No. 14

These minibuses typically operate on flexible frequencies and cater to local travel needs, especially in outer city limits, industrial belts, and rural-urban fringes. Despite their importance, the minibus system currently functions in a fragmented and unregulated manner, lacking formal integration with the city's broader transit network.

There is a critical need to bring these services under a unified regulatory framework, implement route rationalization, and promote fare integration with JCTSL and metro systems. Formalizing these services would not only improve commuter experience but also ensure better traffic management and reduce route duplication.

Para-Transit Services: Shared Autos and Tempos

Para-transit modes such as shared autos and tempos form a vital layer of Jaipur's public transportation framework, especially for last-mile connectivity and short-distance travel within dense residential, market, and institutional areas. These services are typically privately operated, unregulated or semi-regulated, and operate along informal yet consistent corridors.

As per **Table 2.4**, a total of 31 major shared auto and tempo routes have been identified across Jaipur. These routes serve critical transport needs in both core city zones and urban fringes, often filling in service gaps left by formal bus and metro systems.

TABLE 2.4: MAJOR SHARED AUTO & TEMPO ROUTES IN JAIPUR

S. NO.	ROUTE NAME
1	Shikarpura Choraha to Mahatma Gandhi Hospital
2	Sanganer to Goner Mod, Tonk Road
3	Madrampura to Gyanvihar College Tiraha
4	Ramgarh Mod to Jagatpura Bus Stand
5	Gopalpura Mod to Gurjar ki Thadi
6	Ramgarh Mod to Cheelgadi Restaurant
7	Saroj Cinema to Vidhyadhar Nagar
8	Takiya ki Chowki, Kalwad Road to Todi Harmada
9	Sikar Road Tiraha to Vishwakarma
10	Malviya Nagar Sector No. 3 Tempo Stand to Muhana Mandi
11	Jaipur Hotel, Tonk Road 200 Feet Bypass to Lalanpur
12	Surya Nagar (Taron ki Koot) to Siroli Gaon
13	Jaisinghpura Mod, NH 8 (Bhankrota) to Muhana Mandi
14	Shiv Mandir Jaisingpura Khor to Hasanpura Sabji Mandi
15	Jaisinghpura Khor to Railway Station
16	Ramgarh Mod to Saras Dairy Puliya (Near Dainik Bhaskar Office)
17	Jagannathpura Fagi Road to S.M.S. Medical College, Durgapura Railway Station
18	Ramgarh Mod to Pannadhay Circle
19	Baidya Ji ka Chouraha, Niwaru Road to Siwad Mod
20	Niwaru Sarna Doongar Industrial Area to Chandpole (Zanana Hospital Back Gate)
21	Paladi Meena Stand to Oswal Shop, Malviya Nagar Industrial Area
22	Niwaru to Mansarovar Metro Station
23	Gopalbari (Railway Station) to Benad Gaon, Aapno Gaon
24	Jagatpura Stand No. 7 to Vatika Road Hanuman Mandir
25	Paladi Meena Agra Road to Gandhi Nagar Railway Station
26	Bramhapuri Bus Stand to Gyan-Vihar College, Jagatpura
27	Rampura to Kisan Dharmkanta
28	Sanganer Stadium to Nehru Sehkar Bhawan
29	Transport Nagar to Ganga-Jamuna Metro Station
30	Jawahar Circle to Gandhi Nagar Railway Station (Platform No. 1)
31	Mansarovar Metro Station to Jagatpura Mehal Yojna, Jeevan Rekha Hospital

These services typically deploy three-wheelers and four-wheelers (including shared Tempos and Tata Magic-type vehicles) and operate with a high frequency based on passenger demand. Most vehicles follow fixed but unofficial routes and rely on

intermediate stopping patterns at key junctions, metro stations, and hospitals. To improve integration, para-transit services should be included in a formal feeder network plan for metro and bus stations, supported by:

- Route rationalization
- Digital registration and fare metering
- Designated pick-up/drop-off zones
- Driver training and vehicle fitness enforcement

b) Existing Metro System

Jaipur Metro is operated by Jaipur Metro Rail Corporation Limited (JMRCL) which came into service in May 2015 between Mansarovar and Chandpole (Phase IA). It is the first metro in India with double-storey elevated road and metro tracks. At present, Phase 1 (A+B) from Mansarovar to Badi Chaupar (FIGURE 2.4) is operational with following details.

- Phase IA - Mansarovar to Chandpole (9.72 Km, 9 stations)
- Phase IB - Chandpole to Badi Chaupar (2.35 Km, 2 stations)

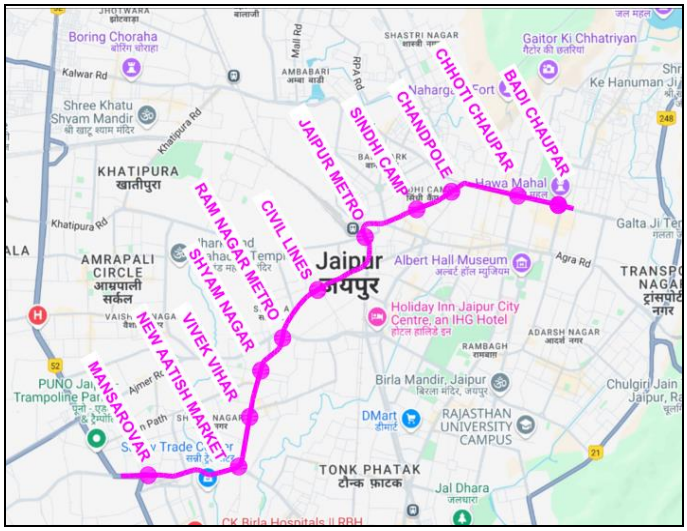
The average daily ridership of Phase 1 corridor is about 60,000. In addition, corridors Phase 1C from Badi Chaupar to Transport Nagar (2.9 Km) and Phase 1D from Mansarovar to Ajmer Road Chauraha (1.3 Km) are under implementation.

The existing fare structure in Jaipur metro is presented in **TABLE 2.5**.

TABLE 2.5: EXISTING FARE STRUCTURE IN JAIPUR METRO

NO. OF STATIONS	FARE (Rs.)
Upto 2	10
3-5	15
6-8	25
9-10	30

FIGURE 2.4: OPERATIONAL METRO CORRIDOR IN JAIPUR



c) Intermediate Public Transport System

Jaipur's Intermediate Public Transport (IPT) system plays a vital role in connecting the city's residents and visitors. IPT consists of tempo, auto-rickshaw, and shared transport services, which provide last-mile connectivity and cater to the city's diverse mobility needs. The IPT scenario in Jaipur consists of the following modes – auto rickshaws, shared autos/ tempos and E-rickshaws.

Shared autos operate on fixed routes, connecting major residential areas, commercial centers, and transportation hubs. Passengers share the ride with others traveling in the same direction, making it a cost-effective option. The city has introduced electric autos and shared autos to reduce pollution and promote eco-friendly transportation. Conventional diesel/petrol shared autos are widely available in the city. Shared autos are an affordable mode of transport, with fares starting from ₹10-₹20. They offer last-mile connectivity, making it easier for passengers to reach their destinations. Shared autos often operate without proper regulation, leading to concerns about safety and fare consistency. The peak hour frequency is observed to be 3-5 minute, whereas the non-peak hour frequency is 10-15 minutes.

E-rickshaws are battery operated rickshaws which can carry a maximum of 4 to 5 passengers. They are eco-friendly and cheap mode of transportation for short duration commutes. There are around 32000 registered e-rickshaws in the city. Some e-rickshaw operators offer fixed route fares, typically ranging from ₹10 to ₹50, depending on the route and distance.

2.1.3. ON-STREET PARKING

On street parking has been observed on all roads in the city which reduces the efficiency of road carriageways leading to the traffic congestion throughout the city. Other reasons for congestion include encroachment of road space by street vendors, and unauthorized movement of auto-rickshaws which have not been regularized.

2.1.4. REGISTERED MOTOR VEHICLES

The city has been experiencing an explosive growth in number of registered vehicles from 2020-21 to 2024-25. The mode wise registered vehicles in the city from years 2020-21 to 2024-25 is given in **TABLE 2.6.**

TABLE 2.6: ANNUAL REGISTERED VEHICLES IN JAIPUR

S. NO.	MODES	NO. OF REGISTERED VEHICLES (YEAR WISE)					
		2020 - 21	2021-22	2022 - 23	2023 - 24	2024 - 25	2025 -26 (TILL NOV '25)
1	2-W	20,79,028	21,55,777	22,95,135	24,09,046	25,91,495	26,92,163
2	E-Rickshaw	19,477	21,561	29,236	30,559	32,440	33,037
3	E-Cart	1,524	1,915	3,034	3,129	3,322	3,383
4	3-W (Passenger)	28,856	29,137	31,976	31,470	33,407	34,021
5	3-W (Load)	5,386	5,664	6,207	6,115	6,491	6,611
6	Motor Cab/ Maxi Cab	28,920	29,324	31,661	36,160	41,764	45,506
7	Motor Car	5,44,983	5,76,341	6,22,653	6,69,191	7,31,438	7,68,683
8	Bus	10,736	11,194	11,491	11,336	11,404	11,404
9	Ambulance	2,479	2,585	2,876	3,031	3,218	3,266
10	School Bus	2,521	2,629	2,807	2,958	3,140	3,188
11	Tractor	45,430	47,432	50,365	53,540	56,877	60,083
12	Dumper/Trailer	13,238	13,806	15,061	15,874	16,851	16,851
13	Goods Carrier	72,788	76,316	84,347	88,899	94,372	96,259
14	Earth Moving Vehicles	4,646	4,845	5,245	5,528	5,951	6,108
15	Others	897	1,193	1,486	6,180	6,274	6,399
Total Vehicles		**28,60,907**	**29,79,719**	**31,93,579**	**33,73,017**	**36,38,444**	**37,86,961**
Growth Rate (%)			**4.15%**	**7.18%**	**5.62%**	**6.46%**	**4.04%**

*Source: Regional Transport Office Jaipur

2.1.5. TRAFFIC SAFETY

The increase in the number of private vehicles and intermixing of slow- & fast-moving vehicles on roads has led to an increase in number of accidents, which is a cause of concern. Considering the urban expanse, population growth and increased trends of vehicles on the city roads; the safety of commuters is equally important.

Traffic safety refers to the methods and measures used to prevent road users from being killed or seriously injured. Typical road users include: pedestrians, cyclists, motorists, vehicle passengers and passengers of on-road public transport (mainly buses and autos). The accident statistics in Jaipur from year 2019 to 2022 is given in **Table 2.7**. The number of accidents in year 2022 is about 2687 in Jaipur including

fatalities of 625 and injuries of 1791. Accidents have been increased by about 40% from year 2020 to 2022.

TABLE 2.7: ACCIDENT STATISTICS IN JAIPUR

YEAR	TOTAL ACCIDENTS	FATALITIES	INJURIES
2019	4271	1283	3581
2020	1940	606	1568
2021	2165	625	1791
2022	2687	765	2167

*Source: MoRTH

As part of the survey and secondary data collection, critical accident-prone locations (commonly referred to as blackspots) within the city were systematically identified. Blackspots are stretches of roads or junctions that witness a significantly higher number of accidents, fatalities, or injuries compared to other areas. The identified blackspots typically share common characteristics such as:

- High vehicular volumes combined with inadequate junction design.
- Lack of proper signage, markings, or pedestrian crossing facilities.
- Encroachments and mixed traffic movement (pedestrians, cyclists, autos, buses, two-wheelers).
- Poor visibility during night hours and insufficient street lighting.
- High frequency of vulnerable road users (pedestrians, cyclists, two-wheeler riders)

The identified blackspot's locations are presented as follows:

BLACK SPOT LOCATIONS	
Trimurti Circle JLN Marg	Jagatpura Pulia to No. 7 Stand
Near Tonk Puliya, Bajaj Nagar	On Nahargarh hill
Balaji Tiraha	Sodala Circle
JDA Circle	Dwarka Das Park Crossroads
OTS Choraha (MNIT)	Riddhi Siddhi Chauraha
Akshaya Patra Crossroad	Shitlamata, Mazar Cut
Chomu Pulia to Lata Cinema Circle	Kanota Bus Stand
Bhankrota Chouraha	NH 48 Toll Plaza
200 Feet Chouraha	Nidad Mode
Todi Mode	Road No. 14, Vishwakarma
Chaksu Cut	Dhobighat Circle

2.2. PRIMARY TRAFFIC & TRAVEL SURVEYS

2.2.1. COVERAGE

A number of traffic & travel surveys including household surveys were conducted to appreciate and quantify the traffic and transport characteristics of commuter travel within the study area. This analysis of the data collected would help in assessing existing traffic characteristics and in developing the Travel Demand Model.

Traffic & travel surveys were carried out to understand the existing traffic scenarios in the study area as part of the assignment. The type and coverage of various traffic & travel surveys are presented in **Table 2.8** and **Figure 2.5.**

TABLE 2.8: PRIMARY TRAFFIC SURVEYS

S. NO.	SURVEY TYPE	COVERAGE
1.	Road Network Inventory	Along major arterial roads
2.	Speed & Delay Surveys	
3.	Directional Classified Traffic Volume Counts along with Passenger Occupancy Surveys	
A	Mid-Blocks/Screen Line	16 locations
B	Intersections	46 locations
C	Outer Cordons	11 Locations
4.	Origin-Destination Survey at Outer Cordon Locations	11 Locations
5.	Terminal Passenger (in + out counts) & OD Surveys	
A	Bus Terminal	1 Location
B	Rail Terminal	2 Locations
C	Air Terminal	1 Location
6.	Goods Terminal Survey	1 Location
7.	PT/IPT Passenger Surveys at PT/IPT Stop	40 Locations
8.	Pedestrian Movement Counts	18 Locations
9.	Parking Survey	26 Locations
10.	Household Interview Survey	11,000 households
11.	IPT/NMT Operator/opinion Survey	500 samples
12.	Fuel Station Survey	3000 samples
13.	Tourist Survey	500 samples

2.2.2. TRAFFIC ZONES AND NETWORK DEVELOPMENT

The base map developed on the basis of secondary data contains information related to sector boundaries, ward boundaries and road/rail networks. A traffic zone system

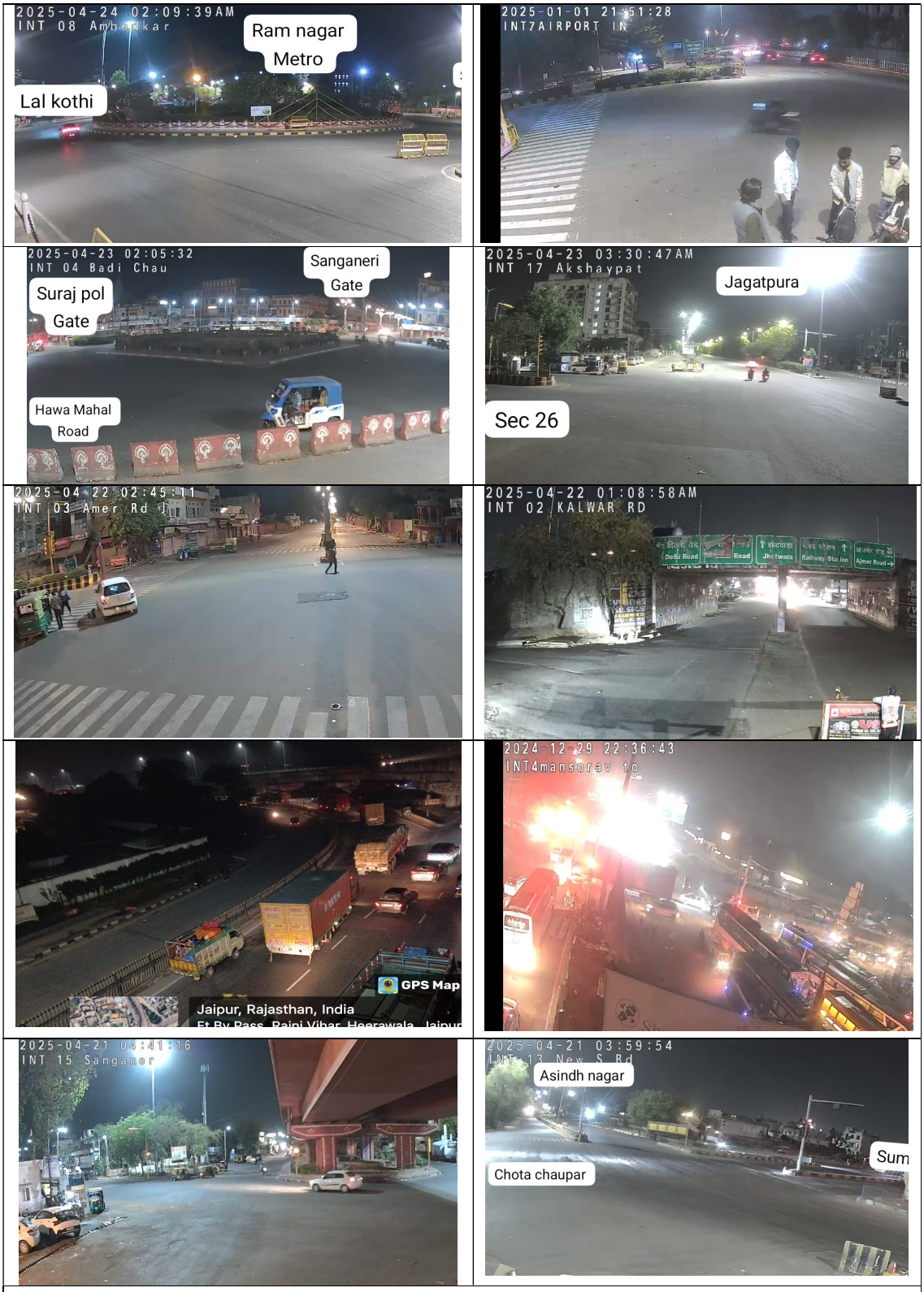
has been developed based on existing sector/ward boundaries and natural physical barriers. Due consideration has been given to the zone system adopted in previous studies and distribution of road & public transportation networks in the study area. The zoning system is sufficiently detailed to capture inter zonal trips.

The study area has been divided into a total of 190 internal zones and 12 external zones. For Jaipur City, the municipal corporation wards have been designated as traffic zones unaltered, leveraging the availability of demographic and socio-economic data such as population and employment. In the rural areas within the study boundary but outside the municipal limits, zones have been delineated based on homogeneous land use and key traffic generation points.

Zone connectors are included in the model to allow the trip matrices to be assigned to the road network. All zones are provided with at least one zone connector. The location and definition of the connector is intended to assimilate, as far as possible, the actual connectivity of trip generation centres to the road network.

The zone system and coded road network is presented in **FIGURE 2.6 & FIGURE 2.7** respectively.

FIGURE 2.5: PRIMARY SURVEYS FOR JAIPUR CMP STUDY



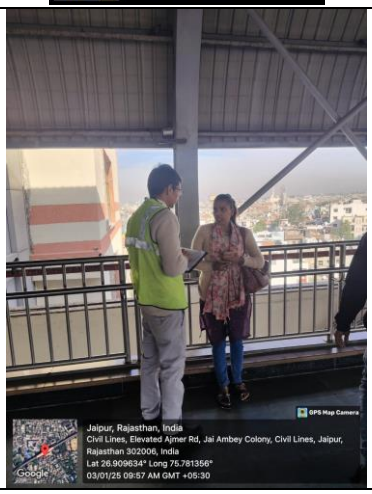
Classified Traffic Volume Counts Survey


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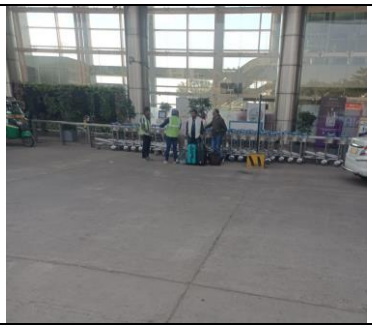

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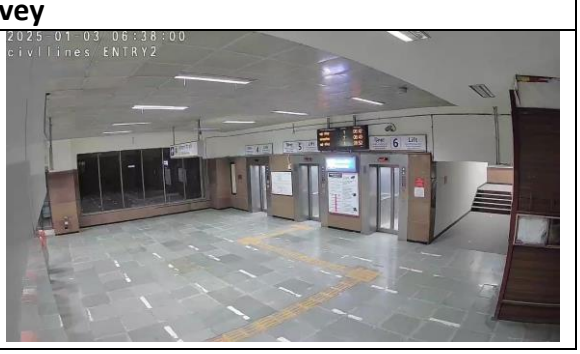

Nawalpura, Rajasthan, India
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Lat 27.282198° Long 75.954237°
01/01/25 12:24 PM GMT +05:30


Jaipur, Rajasthan, India
Civil Lines, Elevated Ajmer Rd, Jai Ambey Colony, Civil Lines, Jaipur, Rajasthan 302006, India
Lat 26.909634° Long 75.781356°
03/01/25 09:57 AM GMT +05:30

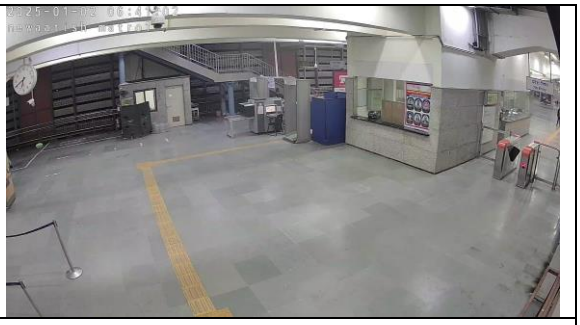

राजस्थान परिवहन निगम
Jaipur, Rajasthan, India
Ram Nagar Metro Station, Hawa Sadak Rd, Ramnagar Extension, Sodala, Jaipur, Rajasthan 302019, India
Lat 26.901776° Long 75.774814°
04/01/25 10:04 AM GMT +05:30

OD Survey




2025 01 03 06:38:00
civil lines ENTRY2





Terminal Survey









IPT Surveys





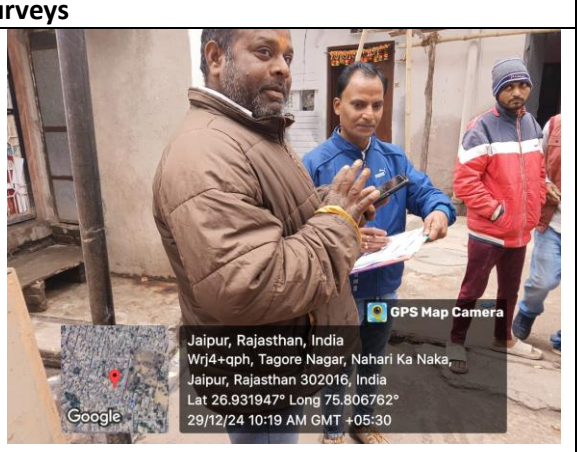
Fuel Station Surveys





Tourist Surveys













Household Surveys

FIGURE 2.6: ZONING SYSTEM FOR JAIPUR CITY

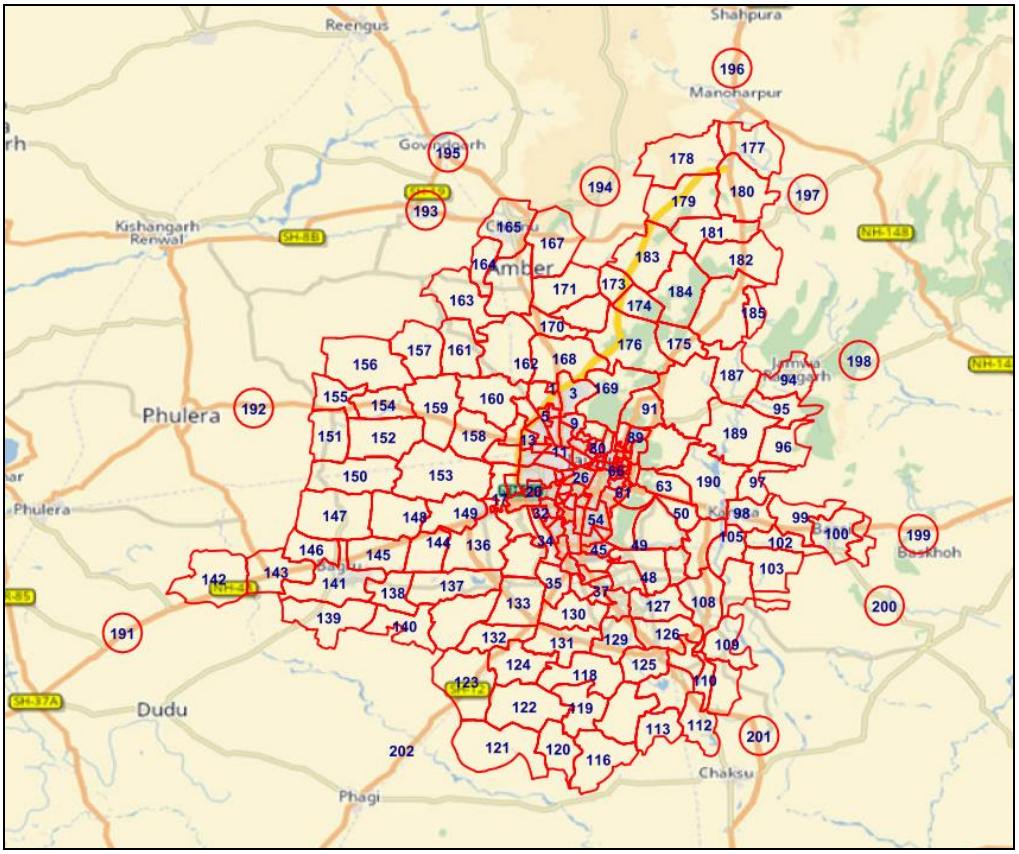
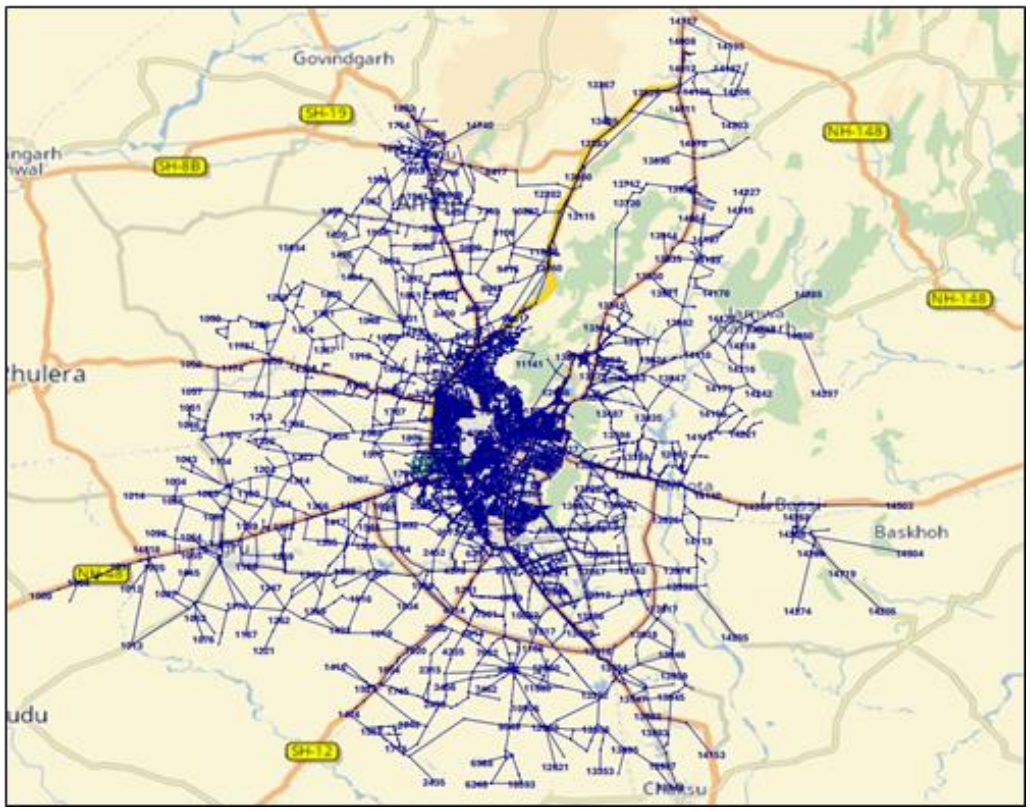


FIGURE 2.7: CODED BASE YEAR ROAD NETWORK



2.2.3. REVIEW OF EXISTING LAND USE PATTERN

The 'Master Development Plan - 2025' was prepared by Jaipur Development Authority keeping in view the overall town density, to accommodate the population by 2025 within the urbanisable area. Thus, the Master Development Plan-2025 has been drawn up with reference to the following five policy zones.

- Urban area 1-U1
- Urban area 2 -U2
- Urban area 3 -U3
- Ecological Zone
- Rural area

U1 is the compact urban area placed as nuclei of development and U2 will be the immediate influenced area on periphery of U1 area. The U3 will be the continuum to U1 and U2 area on either side of major roads. G1 is the Eco-sensitive area which includes rivers, ponds, reserve/protected forest, hills etc. G2 is the Continuum to G1 area acting as buffer to G1, Ecological area includes rest of the eco- sensitive zone. The rest of the area is divided into Rural.

The land use allocations proposed in Master Plan 2025 is presented in Table 2.9. The land use in U1 urban area region is primarily agricultural (38.5%) followed by residential area (23.9%) both of which are spread all over the study area. Forest area covers about 9.3% and open spaces cover about 16.65%. Circulation accounts for 1.5% only.

Commercial activities (2.5%) are mainly concentrated in Walled City and along MI road. Industrial area (2.7%) is not concentrated in any particular point and is observed in the north and south of the city.

TABLE 2.9: LAND USE DISTRIBUTION – MASTER PLAN 2025

S. NO.	LAND USE	AREA (HA)	% OF TOTAL AREA
1	Residential	19,072	23.9
2	Commercial/ Mixed	1,978	2.5
3	Industrial	2,119	2.7
4	Public & Semi-public	2,029	2.5
5	Army	1,103	1.4
6	Parks	543	0.7
7	Circulation	1,196	1.5
8	Agricultural	30,708	38.5
9	Water bodies	322	0.4
10	Forest	7,445	9.3
11	Open Space	13,285	16.6
12	**Total Area**	**79,800**	**100%**

**Source: Master Development Plan 2025 for Jaipur Region*

2.3. ANALYIS OF EXISTING TRAFFIC/TRANSPORT CHARACTERISTICS

The major traffic issues and concerns in the city are discussed in subsequent sections and shown in **FIGURE 2.8**.

- High density development along the core areas of the city is generating heavy traffic flow but due to limited ROW and capacity of roads, traffic congestion is observed along the roads in core area
- There is an absence of off-street parking facilities within the city due to which heavy on - street parking is observed along all the major roads in the city which reduces the effective carriageway width. Thus the traffic chaos can be seen along the major roads especially in core areas.
- The city lacks pedestrian and NMT infrastructure. Basic components of pedestrian infrastructure as footpaths, medians, road crossing facilities etc. are absent from all the important corridors of the city.
- Encroachment is one of the serious concerns in the city which needs to be addressed immediately. Encroachments in the form of informal commercial activities are observed along all the major roads which impact the capacity of the roads and one of the cause for traffic jams in the city.
- The city terminals are in a bad shape and pose intense inconvenience to the commuters. Sindhi Camp bus stand has space constraints and is located in congested areas where traffic jams are a usual scene.
- Lack of enforcement is one of the prime areas of concern in the city including city core. Encroached right of ways, on street parking, jaywalking etc. are some of the acts of traffic violation which can easily be observed in Jaipur.

The issues are widespread which reduces the efficiency of road carriageway leading to congestion and causes vulnerability to road users. Other reasons for congestion include encroachment of road space by street vendors, unauthorized movement of auto-rickshaws and tempos.

FIGURE 2.8: EXISTING TRAFFIC ISSUES IN JAIPUR



Entry and Exit of buses on main road obstructs the smooth traffic flow at Sindhi Camp Bus stand




Lack of Pedestrian Facilities & Pedestrian – Vehicular Conflicts




Absence of Organized Auto Stands leading to on-street parking of Autos




Lack of off-street parking facilities leads to on-street parking along major arterial roads




Encroachments reduces the effective carriageway capacity of the roads




Lack of Pedestrians and NMT infrastructure facilities

2.4. ROAD NETWORK AND SPEED & DELAY CHARACTERISTICS

2.4.1. ROAD NETWORK CHARACTERISTICS

The objective of the road network Inventory survey is to assess the physical characteristics and conditions of the roads in the Study Area, identify physical constraints and bottlenecks, assess potential capacity and identify the extent for its future development.

About 160 km of road network has been identified for road network inventory survey along all arterial and major roads in the Study Area. The survey has been conducted by travelling along the identified road network. The network inventory survey contains the record of right-of-way, carriageway, footpath widths, median length of the sections and predominant land use along the link including encroachments, surface conditions, shoulder surfacing type and width; intersection type and details, on street parking. The data collected from the survey has been analysed to derive the road network characteristics in the Study Area.

i. Right of Way

The distribution of the road network as per right of way (ROW) is presented in **TABLE 2.10**. It can be observed from the table that maximum length of the roads i.e, 39.8 km (24.8%) has 20 – 30 m RoW followed by 33.6 km (21%) of 40 – 50 m RoW. Only 1.2% of the road network has less than 10 m RoW while 9.8% has RoW above 60 m.

TABLE 2.10: DISTRIBUTION OF ROAD NETWORK AS PER RIGHT OF WAY

S. NO.	RIGHT OF WAY (ROW)	ROAD LENGTH (KM)	PERCENTAGE (%)
1	Upto 10	2.0	1.2%
2	10 to 20 m	19.2	12.0%
3	20 to 30 m	39.8	24.8%
4	30 to 40 m	30.4	19.0%
5	40 to 50 m	33.6	21.0%
6	50 to 60 m	19.5	12.2%
7	>60 m	15.7	9.8%
	Total	**160.13**	**100%**

*Source: RITES Primary Survey 2025

ii. Carriageway Width

The distribution of the road network as per carriageway width (CW) is presented in **TABLE 2.11.** It can be observed from the table that only 1.8% of the road network has intermediate lane with carriageway width less than 6 meters, 5% is two lanes, 3.3% three lanes, 25% four lanes, 35.3% has six lanes and 29.5% has 8 lanes. About 85.2% of the surveyed road network has divided carriageway.

TABLE 2.11: DISTRIBUTION OF ROAD NETWORK AS PER CARRIAGEWAY WIDTH

S. NO.	CARRIAGEWAY WIDTH (CW)	ROAD LENGTH (KM)	PERCENTAGE (%)
1	Intermediate Lane (<6m)	2.9	1.8%
2	2 Lane Undivided	7.592	4.7%
3	2 Lane Divided	0.422	0.3%
4	3 Lane Undivided	1.329	0.8%
5	3 Lane Divided	4.009	2.5%
6	4 Lane Undivided	8.032	5.0%
7	4 Lane Divided	31.987	20.0%
8	6 Lane Undivided	2.960	1.8%
9	6 Lane Divided	53.680	33.5%
10	8 Lane Undivided	1.204	0.8%
11	8 Lane Divided	46.024	28.7%
	Total	**160.129**	**100%**

*Source: RITES Primary Survey 2025

iii. Road Surface Type

The distribution of the road network based on surface type is presented in **TABLE 2.12**. It is observed that 94.4% of the surveyed road network has a bitumen surface, while only 5.6% is paved with cement concrete.

TABLE 2.12: DISTRIBUTION OF ROAD NETWORK AS PER ROAD SURFACE

ROAD SURFACE			
S. NO.	ROAD SURFACE	ROAD LENGTH (KM)	PERCENTAGE (%)
1	Bitumen	151.2	94.4%
2	Cement Concrete	8.9	5.6%
Total		**160.129**	**100%**

*Source: RITES Primary Survey 2025

iv. Availability of Street Light

A primary survey revealed that approximately 96.7% of the surveyed road network is equipped with street lighting, ensuring that the majority of the road network is well-lit at night, as presented in **TABLE 2.13**.

TABLE 2.13: DISTRIBUTION OF ROAD NETWORK AS PER AVAILABILITY OF STREET LIGHT

AVAILABILITY OF STREET LIGHT			
S. NO.	STREET LIGHT	ROAD LENGTH (KM)	PERCENTAGE (%)
1	Present	154.8	96.7%
2	Absent	5.4	3.3%
	Total	**160.129**	**100%**

*Source: RITES Primary Survey 2025

v. Availability of Service Road

The surveyed road network lacks service roads, as 61 % of the road network does not have service roads. Only 39% of the surveyed road network have service roads available. A detailed breakdown is presented in **TABLE 2.14.**

TABLE 2.14: DISTRIBUTION OF ROAD NETWORK AS PER AVAILABILITY OF SERVICE ROAD

S. NO.	SERVICE ROAD	ROAD LENGTH (KM)	PERCENTAGE (%)
1	Right Side	6.4	4.0%
2	Left Side	11.2	7.0%
3	Both Side	44.2	27.6%
4	Absent	98.3	61.3%
Total		**160.129**	**100%**

*Source: RITES Primary Survey 2025

vi. Availability of Footpath

A primary survey revealed that approximately 51.5% of the surveyed road network has footpaths available along both sides of the road, while 27.8% of the road network does not have footpaths. It indicates the inadequate NMT infrastructure in the city. A detailed breakdown is presented in **TABLE 2.15.**

TABLE 2.15: DISTRIBUTION OF ROAD NETWORK AS PER AVAILABILITY OF FOOTPATH

S. NO.	FOOTPATH	ROAD LENGTH (KM)	PERCENTAGE (%)
1	Right Side	17.7	11.1%
2	Left Side	15.4	9.6%
3	Both Side	82.4	51.5%
4	Absent	44.5	27.8%
Total		**160.129**	**100%**

*Source: RITES Primary Survey 2025

vii. Abutting Land use

The distribution of the road network with respect to abutting land use is presented in **TABLE 2.16.** The commercial category dominates both sides of the road, with 54.7% (87.6 km) on the left and 55.4% (88.7 km) on the right. Residential road lengths are 16.4 km (10.3%) on the left and 15.7 km (9.8%) on the right. The public & semipublic category is 4.9% (7.8 km) on the left and 3.4% (5.4 km) on the right, indicating fewer public facilities on the right side. Vacant land remains fairly

balanced, with both sides near 9.7%. Agricultural land is almost non-existent—only 0.6 km (0.4%) on the left, and none on the right.

TABLE 2.16: DISTRIBUTION OF ROAD NETWORK AS PER ABUTTING LANDUSE

S. NO.	TYPE	LEFT		RIGHT	
		ROAD LENGTH (KM)	PERCENTAGE	ROAD LENGTH (KM)	PERCENTAGE
1	Residential	16.4	10.3%	15.7	9.8%
2	Commercial	87.6	54.7%	88.7	55.4%
3	Industrial	2.8	1.7%	0.7	0.5%
4	Public & Semipublic	7.8	4.9%	5.4	3.4%
5	Transport	9.7	6.0%	7.8	4.9%
6	Agricultural	0.6	0.4%	0.0	0.0%
7	Vacant	15.5	9.7%	15.6	9.7%
8	Institute	5.1	3.2%	7.6	4.7%
9	Water Body	1.2	0.7%	0.8	0.5%
10	Forest	1.4	0.9%	2.0	1.3%
11	Mix Land use	12.0	7.5%	15.7	9.8%
Total		**160.1**	**100%**	**160.1**	**100%**

*Source: RITES Primary Survey 2025

2.4.2. SPEED AND DELAY SURVEY

The Speed and Delay Survey was conducted along the network using the running car method during both peak and off-peak periods. The analysis of the data provides insights into the journey speed and running speed of the traffic. It also identifies the key factors contributing to delays in traffic movement.

i. Journey speed

The journey speed characteristics during peak and off-peak periods are presented in **Table 2.17**. It is observed that approximately 25.5% of the total road network experiences journey speeds of less than 20 km/h during peak hours, which is 54% higher than during the off-peak period. This indicates congestion, particularly in the core city areas. Around 32% of the road network has speeds between 20-30 km/h, while only 26.6% of the road network maintains speeds between 30-40 km/h. The noticeable decrease in the percentage of roads with higher speeds during peak periods suggests increased congestion and slower traffic flow during peak hours.

During the off-peak period, journey speeds improve significantly. The percentage of journeys with speeds greater than 30 km/h increases by 17% during off-peak hours compared to peak hours.

TABLE 2.17: DISTRIBUTION OF ROAD LENGTH BY PEAK HOUR JOURNEY SPEED

S. NO.	JOURNEY SPEED (IN KMPH)	OFF PEAK PERIOD		PEAK PERIOD	
		ROAD LENGTH (KM)	PERCENTAGE (%)	ROAD LENGTH (KM)	PERCENTAGE (%)
1	0 – 10	7.9	5.0%	13.6	8.5%
2	10 – 20	18.4	11.5%	27.3	17.0%
3	20 – 30	53.9	33.6%	51.2	32.0%
4	30 – 40	52.6	32.9%	42.6	26.6%
5	>40	27.3	17.0%	25.4	15.9%
	TOTAL	**160.1**	**100%**	**160.1**	**100%**

*Source: RITES Primary Survey 2025

ii. Running Speed

The running speed characteristics during peak and off-peak periods are presented in **Table 2.18.** It is observed that the category with speeds of ≤20 km/h, representing slower running speeds, increases during peak periods (from 9.3% off-peak to 12.8% peak). This suggests that congestion or traffic delays result in more roads being driven at slower speeds during peak hours.

The most significant speed range is 20-30 km/h, accounting for 36.5% during off-peak hours and 39.7% during peak hours. The increase in this category during peak periods may reflect slower but steady movement, such as in heavy traffic, but not completely stalled conditions.

TABLE 2.18: DISTRIBUTION OF ROAD LENGTH BY PEAK HOUR RUNNING SPEED

S. NO.	RUNNING SPEED (IN KMPH)	OFF PEAK PERIOD		PEAK PERIOD	
		ROAD LENGTH (KM)	PERCENTAGE (%)	ROAD LENGTH (KM)	PERCENTAGE (%)
1	<=20	14.8	9.3%	20.6	12.8%
2	20-30	58.4	36.5%	63.6	39.7%
3	30-40	58.9	36.8%	49.8	31.1%
4	40-50	15.8	9.9%	15.1	9.4%
5	>50	12.1	7.6%	11.0	6.9%
	TOTAL	**160.1**	**100%**	**160.1**	**100%**

*Source: RITES Primary Survey 2025

iii. Delays

The distribution of causes of delays and their duration during peak and off-peak hours is presented in **Table 2.19.** Traffic congestion is the primary factor contributing to delays during both off-peak (51.5%) and peak (55.6%) hours, with a more pronounced impact during peak hours. This indicates a significant increase in traffic density during rush hours.

Traffic signals contribute notably to delays during both off-peak (44.8%) and peak (41.2%) hours, reflecting their role in managing traffic flow, but also potentially

causing bottlenecks, particularly in congested areas.

TABLE 2.19: DISTRIBUTION OF CAUSES AND DELAYS IN PEAK & OFF-PEAK PERIOD

S. NO.	CAUSES AND DELAYS	OFF PEAK HOUR		PEAK HOUR	
		NO. OF POINTS	%	NO. OF POINTS	%
1	Traffic Congestion	100	51.5%	143	55.6%
2	Junction	4	2.1%	8	3.1%
3	Construction Work	3	1.5%	0	0.0%
4	Signal	87	44.8%	106	41.2%
	Total	**194**	**100.0%**	**257**	**100.0%**

*Source: RITES Primary Survey 2025

2.5. CLASSIFIED TRAFFIC VOLUME COUNTS

Classified traffic volume surveys were carried out on average weekday to quantify the volume of traffic moving along various road sections in the study area. The counts were carried out for 16-hour at mid-block/screen line and intersection locations and for 24 hours at outer cordon locations. The survey locations were selected in a manner that would cover the entire study area and assist in understanding the traffic pattern within the study area as well as with adjacent urban settlements. These surveys help in assessing the existing traffic problems in the study area as well as to validate the transport demand models. The survey locations have been presented in **Figure 2.9** and **Figure 2.10.**

i. Classified Traffic Volume Counts at Screen Line

The daily and peak-hour traffic volumes, measured both in terms of vehicle count and Passenger Car Units (PCUs), are detailed in **TABLE 2.20**. *(Detailed mode wise distribution is attached at **Annexure 2.2** for reference.)* It is noted that traffic at mid-block locations ranges from 46,532 vehicles (71,223 PCUs) at Khirni Phatak to 122,368 vehicles (99,190 PCUs) at Tonk Road, with Jaipur Ajmer Road following closely at 120,689 vehicles (91,685 PCUs) throughout the day.

During the morning peak hour, traffic volumes range from 3,889 PCUs (5,542 vehicles) along Dalda Factory Road to 7,959 PCUs (11,162 vehicles) along Jaipur Ajmer Road. The evening peak hour demonstrates a higher volume, varying from 5,174 PCUs (3,205 vehicles) along Khirnii Phatak to 7,568 PCUs (9,536 vehicles) along Tonk Road.

The Sitapura Railway area exhibits a particularly high concentration of vehicles, with 82,457 vehicles recorded, reflecting a significant peak-direction volume of 70.8%, along with notable peaks during the morning (12.23%) and evening (9.54%) hours.

FIGURE 2.9: OUTER CORDON/SCREEN LINES/MID-BLOCK SURVEY LOCATIONS

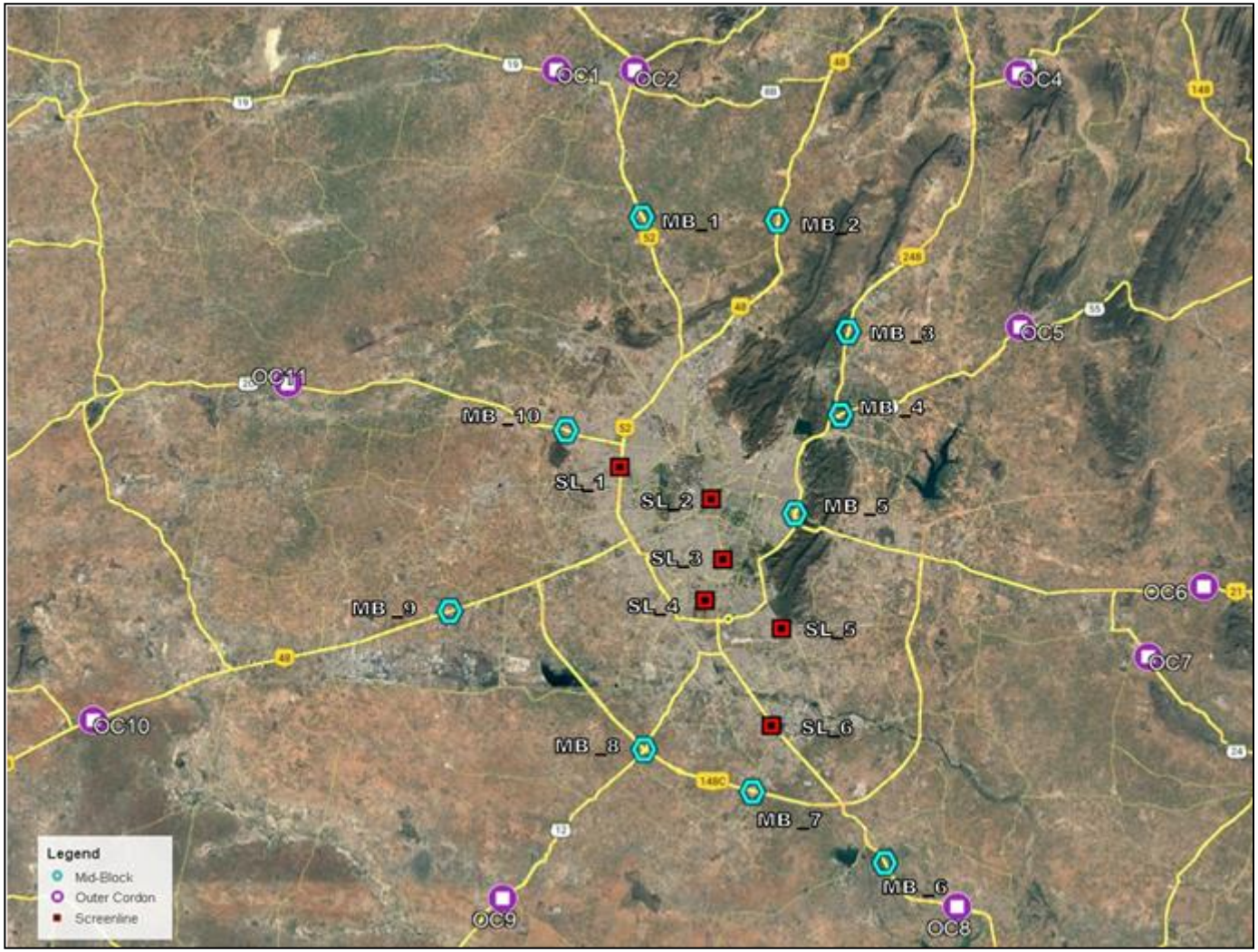


FIGURE 2.10: INTERSECTION SURVEY LOCATIONS

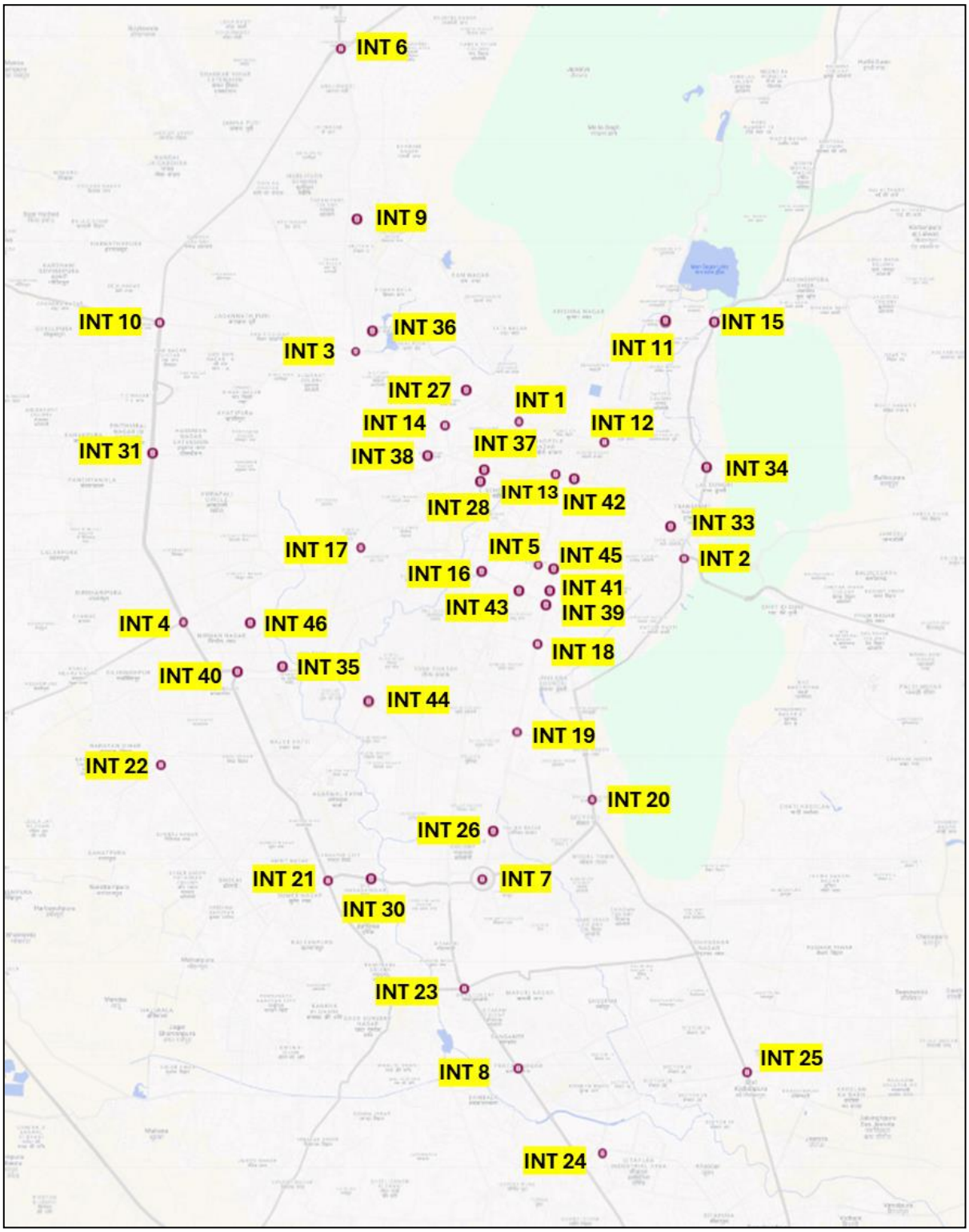


TABLE 2.20: INTENSITY AND DIRECTIONAL DISTRIBUTION OF TRAFFIC AT SCREENLINE LOCATIONS

S. NO	NAME OF MID-BLOCK LOCATION	TOTAL TRAFFIC		MORNING PEAK				EVENING PEAK			
		(VEH.)	(PCU)	(VEH.)	% OF TOTAL TRAFFIC	(PCU)	% OF TOTAL TRAFFIC	(VEH.)	% OF TOTAL TRAFFIC	(PCU)	% OF TOTAL TRAFFIC
1	Khirni Phatak (Morning Peak : 1300-1400) (Evening Peak: 1430 – 1530)	46532	71223	3199	6.87	4975	6.98	3205	6.89	5174	7.26
2	Jaipur Ajmer Road (Morning Peak: 0945 –1045) (Evening Peak: 1730 – 1830)	120689	91685	11162	9.25	7959	8.66	9287	7.69	7087	7.71
3	Tonk Road (Morning Peak: 1000 –1100) (Evening Peak: 1700 – 1800)	122368	99190	10032	8.20	7735	7.80	9536	7.79	7568	7.63
4	Dalda Factory Road (Morning Peak: 0915 –1015) (Evening Peak: 1715 – 1815)	63887	46289	5542	8.67	3889	8.40	4455	6.97	3158	6.82
5	Jagatpura Road (Morning Peak: 0930 –1030) (Evening Peak: 1715 – 1815)	110603	86582	10541	9.53	7533	8.70	8864	8.01	6918	7.99
6	Sitapura Railway Crossing (Morning Peak: 0845 –0945) (Evening Peak: 1800 – 1900)	82457	64279	10087	12.23	6581	10.24	7867	9.54	5591	8.70

*Source: RITES Primary Survey 2025

ii. Classified Traffic Volume Counts at Mid Blocks

The daily and peak-hour traffic volumes, measured both in terms of vehicle count and Passenger Car Units (PCUs), are detailed in **TABLE 2.21, Figure 2.11.** (*Detailed mode-wise distribution is attached at **Annexure 2.3** for reference.*)

It is noted that traffic at different locations ranges from 15,279 vehicles (16,122 PCUs) at Vatika Road to 69,819 vehicles (65,490 PCUs) at Jaipur Sikar Road, with Jaipur Jodhpur Highway following closely at 52,508 vehicles (94,705 PCUs) throughout the day.

During the morning peak hour, traffic volumes range from 1,112 PCUs (1,039 vehicles) along Vatika Road to 4,969 PCUs (4,082 vehicles) along Jaipur Sikar Road. The evening peak hour demonstrates varying volumes, ranging from 982 PCUs (3.7% of total traffic) along Delhi Jaipur NH 48 to 4,875 PCUs (7.3% of total traffic) along Gokulpura Kalwar Road.

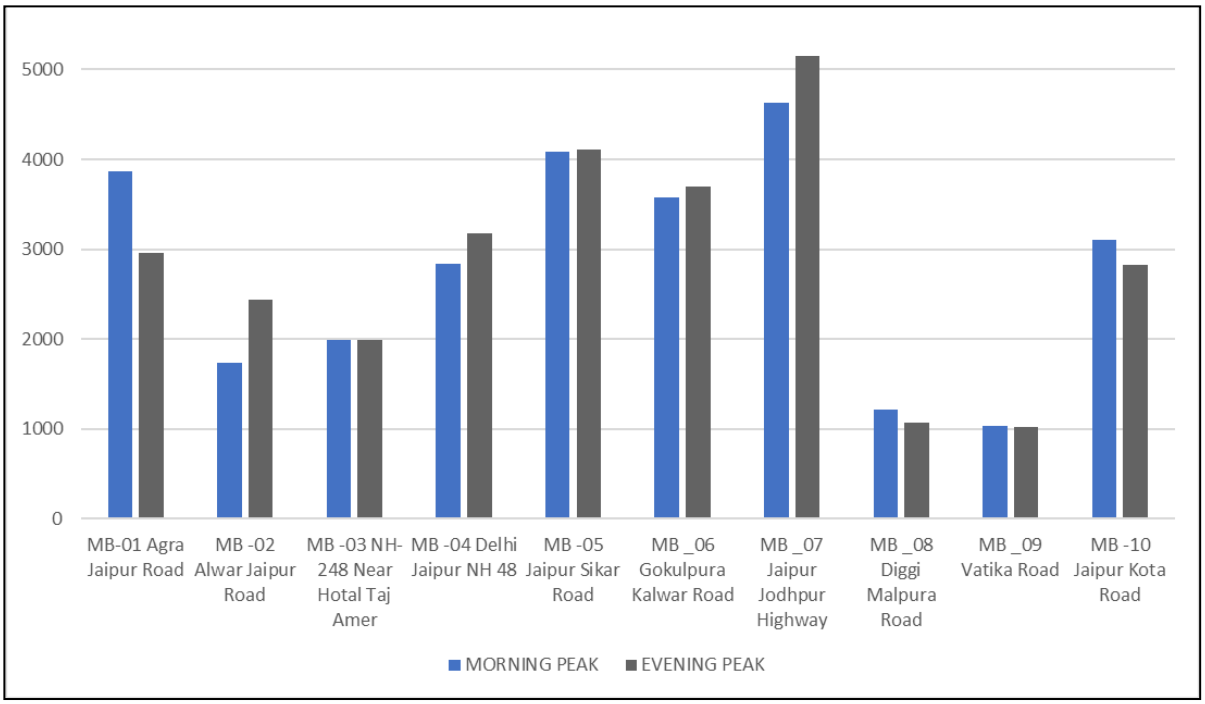
The Alwar Jaipur Road exhibits a particularly high concentration of vehicles, with 30,918 vehicles recorded, reflecting a significant peak-direction volume during the evening peak (12.3%), along with notable morning peaks (7.7%).

TABLE 2.21: INTENSITY OF TRAFFIC AT MID BLOCK LOCATIONS

LOCATION NAME	TOTAL TRAFFIC		MORNING PEAK				EVENING PEAK			
	(VEH.)	(PCU)	(VEH.)	% OF TOTAL TRAFFIC	(PCU)	% OF TOTAL TRAFFIC	(VEH.)	% OF TOTAL TRAFFIC	(PCU)	% OF TOTAL TRAFFIC
MB-01 Agra Jaipur Road	44583	46858	4251	9.5	3872	8.3	2974	6.7	2964	6.3
MB -02 Alwar Jaipur Road	30918	23548	2369	7.7	1733	7.4	3795	12.3	2433	10.3
MB -03 NH-248 Near Hotal Taj Amer	29040	27841	2354	8.1	1992	7.2	2107	7.3	1992	7.2
MB -04 Delhi Jaipur NH 48	26524	59971	1729	6.5	2833	4.7	982	3.7	3176	5.3
MB -05 Jaipur Sikar Road	69819	65490	4969	7.1	4082	6.2	4723	6.8	4107	6.3
MB _06 Gokulpura Kalwar Road	66761	53426	4403	6.6	3572	6.7	4875	7.3	3692	6.9
MB _07 Jaipur Jodhpur Highway	52508	94705	2877	5.5	4626	4.9	3205	6.1	5145	5.4
MB _08 Diggi Malpura Road	19948	19741	1216	6.1	1211	6.1	1082	5.4	1068	5.4
MB _09 Vatika Road	15279	16122	1112	7.3	1039	6.4	1064	7.0	1021	6.3
MB -10 Jaipur Kota Road	38850	43624	3317	8.5	3104	7.1	3009	7.7	2825	6.5
All Mid-Block Locations	44583	46858	4251	9.5	3872	8.3	2974	6.7	2964	6.3

*Source: RITES Primary Survey 2025

FIGURE 2.11: MORNING AND EVENING PEAKS TRAFFIC SHARE AT MID BLOCK LOCATIONS



*Source: RITES Primary Survey 2025

iii. Classified Traffic Volume Counts at Intersections

The daily and peak-hour traffic characteristics at intersection locations are presented in **TABLE 2.22**. The detailed mode wise distribution is presented in **TABLE 2.23**. The analysis of peak hour traffic volumes reveals critical insights into intersection-level congestion patterns across the city.

At the top of the volume spectrum, Collectorate Circle stands out as the busiest junction, handling 361,601 vehicles and 281,128 PCUs daily. This substantial load reflects its role as a central administrative and regional traffic hub. Other high-volume intersections include Ajmer Road (1,56,105 PCUs), OTS Circle (111,637 PCUs), Chomu Pulia (1,20,202 PCUs), Apex Circle (1,18,332 PCUs) and Hawa Sadak (1,17,717 PCUs) highlighting their critical position within the city's road hierarchy and their need for priority in traffic management strategies.

Conversely, intersections such as Janpath Crossing (32,627 PCUs), Global Circle (38,622 PCUs), Jawahar Circle (40,591 PCUs), Moti Doongri Circle (47,353 PCUs) Amer Road Junction (48,224 PCUs), Parshuram Circle (53,263 PCUs and Bharatmata Circle (58,191 PCUs) report the lowest daily traffic volumes. Despite this, some—like Jawahar Circle—experience high peak hour pressure, pointing to a mismatch between total volume and time-specific congestion patterns.

The highest peak hour share is observed at Mansarovar Metro Junction (11.85%), Govt. Hostel Chauraha (11.74%) while lowest peak hour share is observed at Ajmeri Gate junction (5.12%) and Chandpole (5.39%).

TABLE 2.22: INTENSITY OF TRAFFIC AT INTERSECTION LOCATIONS

S. NO.	NAME OF INTERSECTION LOCATION	MORNING PEAK		EVENING PEAK		TOTAL DAILY PCU
		(PCU)	% OF TOTAL	(PCU)	% OF TOTAL	
1	Chandpole	6528	5.39%	7555	6.24%	91331
2	Rotary Circle	7794	8.00%	6706	6.88%	86417
3	Chomu Pulia	8525	5.61%	10306	6.79%	120202
4	Ajmer Road Junction	11548	7.56%	11317	7.41%	156105
5	Narayan Singh Circle	6521	6.70%	6442	6.62%	84979
6	200ft Bypass Chowk	8251	7.72%	8241	7.72%	111131
7	Jawahar Circle	7722	15.85%	8837	18.14%	40591
8	Haldi Ghati Junction	7861	6.33%	7381	5.95%	100384
9	Parshuram Circle	3946	5.57%	4215	5.95%	53263
10	Kalawar Road Junction	7339	5.97%	7214	5.86%	92885
11	Amer Road Junction	3505	5.26%	4590	6.89%	48224
12	Badi Chaupar Junction	4062	5.02%	4626	5.71%	62607
13	Ajmeri Gate Junction	5877	5.12%	6196	5.40%	80702
14	Collectorate Circle	21314	5.89%	22204	6.14%	281128
15	Guru Nanak Junction	7874	6.75%	6778	5.81%	93562
16	Ambedkar Circle	7433	4.98%	9723	6.52%	110989
17	Hawa Sadak Junction	9526	6.01%	10118	6.38%	117717
18	Gandhi Circle	9332	5.95%	8747	5.58%	115156
19	MNIT (OTS) Circle	11142	7.72%	9007	6.24%	111637
20	Apex Circle	9002	5.91%	9229	6.06%	118332
21	New Sanganer Road Junc.	7780	6.31%	7998	6.49%	97517
22	Bharatmata Circle	4320	6.24%	5302	7.66%	58191
23	Sanaganer Junction	5391	5.33%	5950	5.88%	78725

S. NO.	NAME OF INTERSECTION LOCATION	MORNING PEAK		EVENING PEAK		TOTAL DAILY PCU
		(PCU)	% OF TOTAL	(PCU)	% OF TOTAL	
24	Global Circle	4696	10.07%	3646	7.82%	38622
25	Akshaypatra Junction	6292	6.55%	6069	6.32%	76345
26	SL Crossing	9289	9.28%	9764	9.75%	100137
27	Pital Factory Junction	7861	10.04%	7555	9.65%	78280
28	Government Press Junction	10173	9.72%	10942	10.45%	104687
29	Ramgarh Mod	8040	9.44%	7634	8.96%	85153
30	Dwarka Das Park Junction	9484	10.26%	8390	9.08%	92431
31	Khatipura Circle	9927	9.51%	9602	9.20%	104385
32	Balaji Mod	10685	8.91%	10288	8.58%	119890
33	Gurudwara Mod	10472	9.81%	9225	8.64%	106784
34	Galta Gate Junction	7171	8.77%	7077	8.65%	81780
35	Ganga Jamuna Petrol Pump	9657	9.00%	9601	8.94%	107350
36	Ambabari Junction	7505	9.39%	8073	10.10%	79963
37	Government Hostel Chauraha	8602	11.16%	9051	11.74%	77084
38	Jaipur Junction	4735	10.14%	4996	10.70%	46699
39	JDA Circle	11822	11.63%	10797	10.62%	101622
40	Mansarovar Metro Junction	10805	11.85%	9531	10.45%	91196
41	Moti Doongri Circle	5147	10.87%	4976	10.51%	47353
42	New Gate	6545	11.14%	6677	11.37%	58746
43	Rambagh Circle	10075	11.33%	9073	10.20%	88937
44	Riddhi Siddhi Circle	10825	10.89%	11374	11.45%	99354
45	Trimurti Circle	8231	10.95%	8049	10.70%	75202
46	Janpath Crossing	3760	11.52%	3621	11.10%	32627

*Source: RITES Primary Survey 2025

iv. Classified Traffic Volume Counts at Outer Cordon Locations

The total daily and peak-hour traffic data at 11 locations are provided in **TABLE 2.24 Figure 2.13** *(Detailed mode wise distribution is attached at **Annexure 2.4** for reference.)* It is observed that traffic volumes across locations range from 4,922 vehicles (4,106 PCUs) at Achrol (SH 52) to 74,149 vehicles (110,287 PCUs) at Chomu (NH 52 Sikar Road) on a typical working day.

During the morning peak hour, traffic varies from 516 PCUs (549 vehicles) along Kathawal (NH 52 Tonk Road) to 8,620 PCUs (6,085 vehicles) at Chomu (NH 52 Sikar Road). The evening peak hour demonstrates a higher volume, ranging from 350 PCUs (454 vehicles) at Achrol to 6,349 PCUs (4,400 vehicles) at Chomu. Although Chomu exhibits the highest PCU count during the evening peak, the percentage of total vehicles contributing to traffic is relatively low at 5.93%. Notably, Nawalpura (NH 48) with 27,382 vehicles, shows an exceptionally high concentration of traffic in the peak direction, accounting for 84.71% of the total vehicles.

FIGURE 2.12: MORNING AND EVENING PEAKS TRAFFIC SHARE AT INTERSECTION LOCATIONS

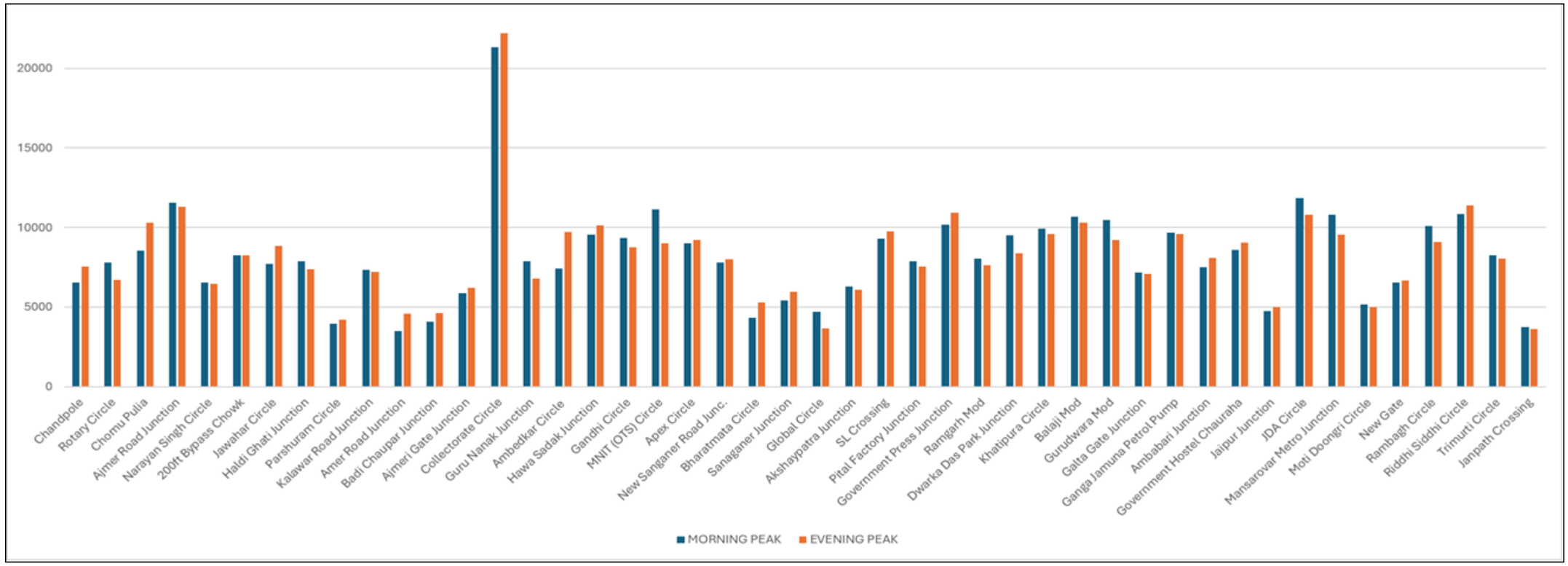


TABLE 2.23: MODE WISE DAILY TRAFFIC AT INTERSECTION LOCATIONS

	Location	Fast Moving Passenger Vehicles							Buses					Goods Vehicles					Slow Vehicles				Total Vehicles	Total PCUs
		Car	Taxi	Two Wheeler	Auto Rickshaw	E-Auto	Shared Auto/	E-rickshaw	Mini Bus	Intercity Bus	City Bus	School Bus	Total Fast Moving Passenger Vehicles	LCV	Truck	MAV	Tractor Trailer	Total Goods Vehicles	Cycle	Cycle Rickshaw	Others	Total Slow Vehicles		
1	Chandpole	17973	20	64161	9558	350	1099	22213	103	93	37	28	115635	4146	16	0	73	4235	1040	109	5	1154	121024	91331
2	Jawahar Nagar Circle	28695	4326	44140	4746	492	1951	4776	413	1668	138	152	91497	3840	1226	191	316	5573	135	68	126	329	97399	86417
3	Chomu Pulia	41523	3993	80814	5080	410	5094	5327	1378	1852	617	304	146392	4111	153	6	40	4310	967	60	129	1156	151858	120202
4	Ajmer Road Junction	59979	593	58811	4396	129	2220	211	374	720	275	245	127953	11008	3199	2975	196	17378	3001	1881	2474	7356	152687	156105
5	Narayan Singh Circle	29827	1288	43359	5406	341	4268	4862	1132	1976	1338	246	94043	1985	128	5	65	2183	868	65	156	1089	97315	84979
6	200ft Bypass Chowk	39611	1135	42056	1085	195	674	1933	363	1445	164	191	88852	12208	2276	2144	678	17306	547	21	91	659	106817	111131
7	Jawahar Circle	21160	1235	20516	2696	99	315	126	179	54	39	22	46441	1476	263	94	63	1896	348	20	20	388	48725	40591
8	Haldi Ghati Junction	33930	2339	68663	3713	210	3107	2873	1045	989	470	408	117747	4494	422	542	226	5684	469	45	152	666	124097	100384
9	Parshuram Circle	19539	2299	39867	1535	80	471	3300	93	15	196	117	67512	2628	66	6	51	2751	522	8	59	589	70852	53263
10	Kalawar Road Junction	27700	2726	76418	2893	230	1697	4279	337	350	190	396	117216	4219	277	131	521	5148	413	69	163	645	123009	92885
11	Amer Road Junction	7450	2150	42323	2049	340	1761	7217	374	165	117	88	64034	1734	46	4	211	1995	555	45	14	614	66643	48224
12	Badi Chaupar Junction	12942	2322	41322	5202	538	2490	12795	680	85	204	164	78744	1528	9	1	99	1637	536	35	10	581	80962	62607
13	Ajmeri Gate Junction	16963	1951	72998	5709	259	2163	10195	328	19	361	94	111040	2407	3	0	4	2414	966	79	201	1246	114700	80702

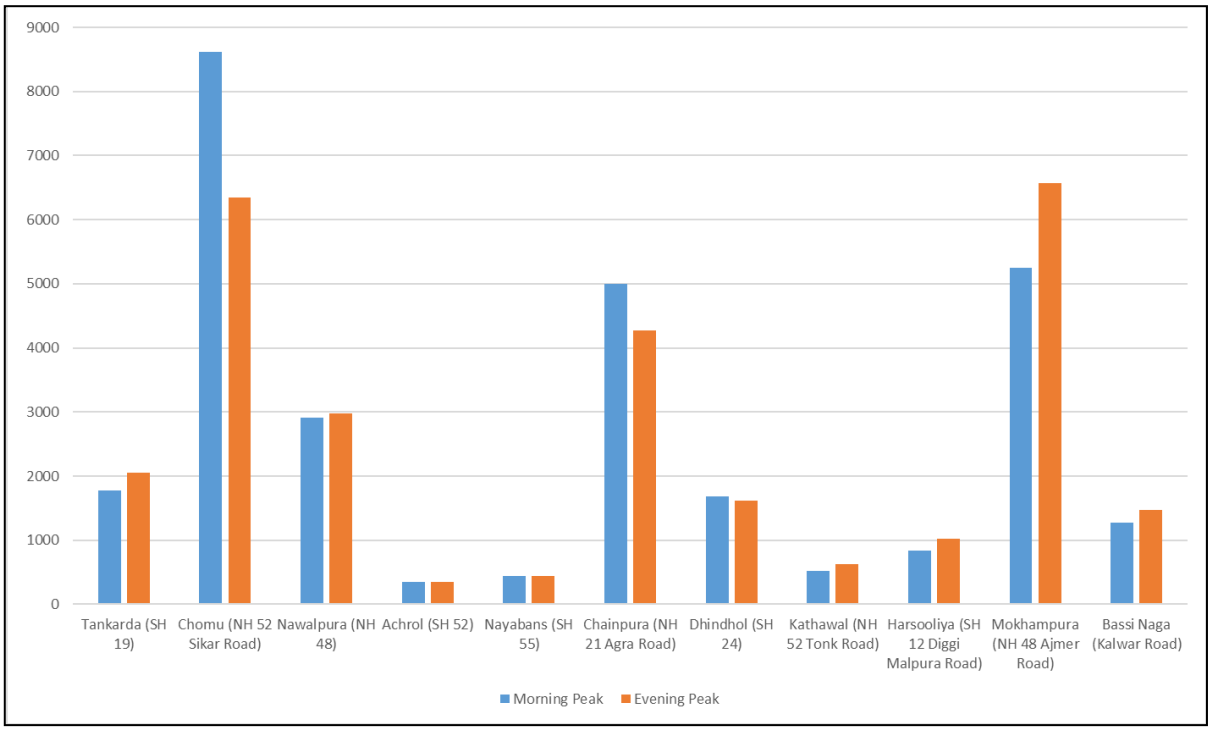
	Location	Fast Moving Passenger Vehicles							Buses					Goods Vehicles					Slow Vehicles				Total Vehicles	Total PCUs
		Car	Taxi	Two Wheeler	Auto Rickshaw	E-Auto	Shared Auto/	E-rickshaw	Mini Bus	Intercity Bus	City Bus	School Bus	Total Fast Moving Passenger Vehicles	LCV	Truck	MAV	Tractor Trailer	Total Goods Vehicles	Cycle	Cycle Rickshaw	Others	Total Slow Vehicles		
14	Collectorate Circle	120883	2361	190517	22148	932	2378	4417	343	1730	541	358	346250	13007	136	29	302	13474	1294	132	451	1877	361601	281128
15	Guru Nanak Junction	21233	2894	66697	3658	1040	3010	9448	363	1032	414	175	109964	5042	847	236	311	6436	130	41	91	262	116662	93562
16	Ambedkar Circle	50863	5973	79497	6478	257	1358	887	404	32	113	43	145905	2339	14	1	17	2371	849	11	39	899	149175	110989
17	Hawa Sadak Junction	41561	4874	88316	9944	115	161	5663	1079	32	300	320	152365	3617	152	6	45	3820	2158	150	46	2354	158539	117717
18	Gandhi Circle	48771	5748	86650	8772	282	2486	169	134	9	81	92	153194	2781	11	0	29	2821	651	13	33	697	156712	115156
19	MNIT (OTS) Circle	47185	5406	74527	9658	452	2007	199	233	333	6	219	140225	2981	177	25	46	3229	358	3	467	828	144282	111637
20	Apex Circle	46860	5438	80282	9185	291	1945	833	375	149	128	303	145789	5512	231	63	237	6043	383	20	112	515	152347	118332
21	New Sanganer Road Junc.	38056	3293	64750	3961	308	3031	2453	448	92	90	182	116664	5322	298	109	399	6128	419	14	71	504	123296	97517
22	Bharatmata Circle	22290	2013	35318	1168	121	818	717	112	42	1	119	62719	5106	517	251	340	6214	198	24	59	281	69214	58191
23	Sanaganer Junction	22577	2788	57833	4041	258	2925	3363	767	154	1025	152	95883	4643	116	20	124	4903	269	117	64	450	101236	78725
24	Global Circle	9185	1213	27484	1519	258	129	2354	220	727	58	311	43458	1792	102	36	321	2251	628	5	300	933	46642	38622
25	Akshaypatra Junction	31869	3596	50158	3858	279	929	702	230	223	28	389	92261	2737	284	103	166	3290	123	1	322	446	95997	76345
26	Sl Crossing	45168	5281	59927	5250	107	1866	2799	955	8	1006	266	122633	1951	6	1	25	1984	1234	37	142	1412	126030	100137
27	Pital Factory Junction	16785	1504	60728	3763	77	3426	5140	2181	797	704	271	95375	3072	15	0	48	3135	2995	784	176	3955	102465	78280
28	Government Press Junction	38331	1629	67525	5228	107	2689	4033	1695	1732	554	130	123652	3876	47	0	22	3945	2445	454	120	3019	130615	104687
29	Ramgarh Mod	13723	2626	68131	4060	83	6024	9036	2082	281	282	168	106495	2648	82	3	504	3237	3213	400	111	3724	113456	85153
30	Dwarka Das Park Junction	37780	1658	62179	2405	49	666	999	160	118	72	276	106363	4329	1838	0	360	6526	1402	70	44	1516	116145	92431
31	Khatipura Circle	40880	1645	82869	4757	97	1801	2701	797	53	165	332	136096	3025	92	8	55	3180	2561	157	349	3067	142343	104385
32	Balaji Mod	46146	282	69654	4558	93	1252	1878	959	25	201	545	125593	7954	1447	1491	496	11388	1194	37	92	1323	135404	119890
33	Gurudwara Mod	23396	1343	75258	6828	139	4231	6347	2423	1639	902	433	122940	5463	190	4	282	5939	1535	512	375	2423	131302	106784
34	Galta Gate Junction	18502	1574	49416	3132	64	4489	6733	1530	839	63	156	86498	4275	899	333	714	6222	1055	111	205	1371	94090	81780
35	Ganga Jamuna Petrol Pump	46899	2495	66490	6683	136	1430	2145	1341	3	528	442	128593	4201	340	20	80	4640	1238	134	104	1476	134710	107350
36	Ambabari Junction	28203	468	64239	2304	47	1676	2514	535	29	405	238	100660	5001	114	1	116	5232	1462	99	79	1640	107531	79963
37	Government Hostel Chauraha	19221	2369	62286	8397	5	70	5742	673	300	1438	70	100571	1931	14	0	10	1955	1269	42	1	1312	103838	77084
38	Jaipur Junction	9367	1234	21908	10725	1	62	9987	598	53	402	7	54343	1056	12	0	36	1104	421	17	4	442	55888	46699
39	JDA Circle	35694	3575	92819	10336	0	333	962	195	17	125	10	144066	1821	14	0	30	1866	1175	8	3	1186	147117	101622
40	Mansarovar Metro Junction	32702	4182	72341	5214	42	789	2057	85	9	178	29	117716	4765	73	4	211	5052	849	8	23	880	123648	91106
41	Moti Doongri Circle	13974	2010	32534	4577	0	176	3970	176	105	1050	3	58574	1255	21	3	46	1323	755	9	5	770	60667	47353
42	New Gate	12085	1379	45743	6235	21	169	10477	433	10	735	3	77297	1342	8	0	16	1365	762	56	4	822	79483	58739
43	Rambagh Circle	29251	3582	70300	7792	0	621	3315	653	0	1461	0	117952	1442	17	3	40	1502	750	9	8	767	120220	87961
44	Riddhi Siddhi Circle	32425	4148	77936	9243	0	881	7504	117	1	209	0	132454	3004	46	1	44	3095	766	30	12	807	136357	99365
45	Trimurti Circle	24216	2943	54113	9448	1	369	3595	278	38	1282	0	96400	1725	20	3	25	1772	499	13	1	514	98686	75085
46	Janpath Crossing	14520	1925	23487	2018	1	127	211	35	0	9	0	42333	1074	10	0	13	1097	473	13	7	493	43923	32627

TABLE 2.24: INTENSITY AND DIRECTIONAL DISTRIBUTION OF TRAFFIC AT OUTER CORDON LOCATIONS

S. No	Name of Outer Cordon Location	Total Traffic		Morning Peak				Evening Peak				Directional Distribution			
		Veh.	PCU's	Veh.	% of Total Traffic	PCU's	% of Total Traffic	Veh.	% of Total Traffic	PCU's	% of Total Traffic	Peak Directional (PCU)	%	Off Peak Directional (PCU)	%
1	Tankarda (SH 19) (Morning Peak: 1245 -1345) (Evening Peak: 1730 – 1830)	29517	25597	2023	6.85	1770	6.91	2581	8.74	2054	8.02	1080	52.59	974	47.43
2	Chomu (NH 52 Sikar Road) (Morning Peak : 0915 -1015) (Evening Peak: 1845 – 1945)	74149	110287	6085	8.21	8620	7.82	4400	5.93	6349	5.76	5851	67.88	2769	32.12
3	Nawalpura (NH 48) (Morning Peak : 1245 -1345) (Evening Peak: 1700 – 1800)	27382	45070	1868	6.82	2912	6.46	2011	7.34	2976	6.60	2521	84.71	455	15.29
4	Achrol (SH 52) (Morning Peak : 1000 -1100) (Evening Peak: 1700 – 1800)	4922	4106	391	7.94	356	8.67	454	9.22	350	8.53	214	60.11	142	39.89
5	Nayabans (SH 55) (Morning Peak : 0830 -0930) (Evening Peak: 1700 – 1800)	6033	5190	558	9.25	445	8.56	547	9.07	445	8.57	265	59.62	180	40.38
6	Chainpura (NH 21 Agra Road) (Morning Peak : 0830 -0930) (Evening Peak: 1530 – 1630)	62330	70566	5496	8.82	4994	7.08	4182	6.71	4268	6.05	2550	51.06	2444	48.94
7	Dhindhol (SH 24) (Morning Peak : 0930 -1030) (Evening Peak: 1530 – 1630)	27841	21472	2309	8.29	1682	7.83	2151	7.73	1614	7.52	850	50.51	833	49.49
8	Kathawal (NH 52 Tonk Road) (Morning Peak : 1130 -1230) (Evening Peak: 1800 – 1900)	8005	7047	549	6.86	516	7.32	780	9.74	626	8.88	370	59.07	256	40.93
9	Harsooliya (SH 12 Diggi Malpura Road) (Morning Peak : 1215 -1315) (Evening Peak: 1500 - 1600)	11585	11867	916	7.91	845	7.12	1037	8.95	1018	8.58	551	54.08	468	45.92
10	Mokhampura (NH 48 Ajmer Road) (Morning Peak : 1000 -1100) (Evening Peak: 1715 - 1815)	55632	108335	3174	5.71	5246	4.84	3907	7.02	6565	6.06	3463	52.75	3102	47.25
11	Bassi Naga (Kalwar Road) (Morning Peak : 0830 -0930) (Evening Peak: 1730 - 1830)	17440	16801	1487	8.53	1269	7.55	1656	9.50	1471	8.76	814	55.34	657	44.66

*Source: RITES Primary Survey 2025

FIGURE 2.13: MORNING AND EVENING PEAK TRAFFIC SHARE AT OUTER CORDON LOCATIONS



*Source: RITES Primary Survey 2025

2.6. ORIGIN AND DESTINATION SURVEYS AT OUTER CORDON LOCATIONS

The distribution of passengers by trip purpose, as shown in **TABLE 2.25**, indicates that the majority of trips are made for work (38.18%) and business (21.38%) purposes. Educational trips account for approximately 11.13%, while social trips represent 10.02%. Tourism-related trips contribute to 8.99%, and other trip purpose including shopping, recreation & religious make up around 10.30% of the total.

TABLE 2.25: DISTRIBUTION OF OUTER CORDON PASSENGERS BY TRIP PURPOSE

PURPOSE	WORK	BUSINESS	EDUCATION	SOCIAL	OTHERS	TOURIST	TOTAL
TOTAL	94259	52779	27481	24727	25427	22184	246857
%	38.18	21.38	11.13	10.02	10.30	8.99	100.00

*Source: RITES Primary Survey 2025

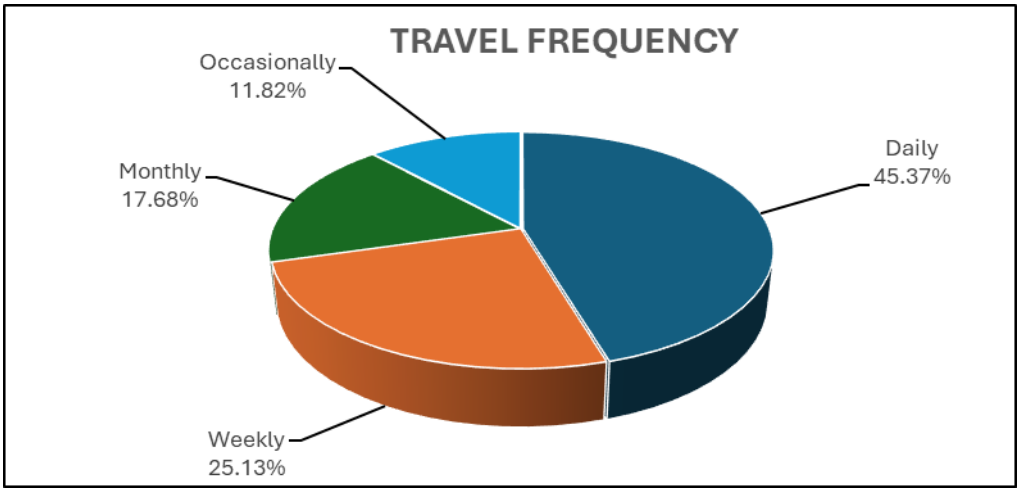
The analysis of travel frequency, as shown in **TABLE 2.26** and **Figure 2.14**, reveals that approximately 45.37% of passengers travel daily, 25.13% travel weekly, 17.68% travel monthly, and 11.82% travel occasionally.

TABLE 2.26: DISTRIBUTION OF OUTER CORDON PASSENGERS BY FREQUENCY

FREQUENCY	DAILY	WEEKLY	MONTHLY	OCCASIONALLY	TOTAL
TOTAL	112002	62029	43654	29172	246857
(%)	45.37	25.13	17.68	11.82	100.00

*Source: RITES Primary Survey 2025

FIGURE 2.14: DISTRIBUTION OF OUTER CORDON PASSENGERS BY FREQUENCY



*Source: RITES Primary Survey 2025

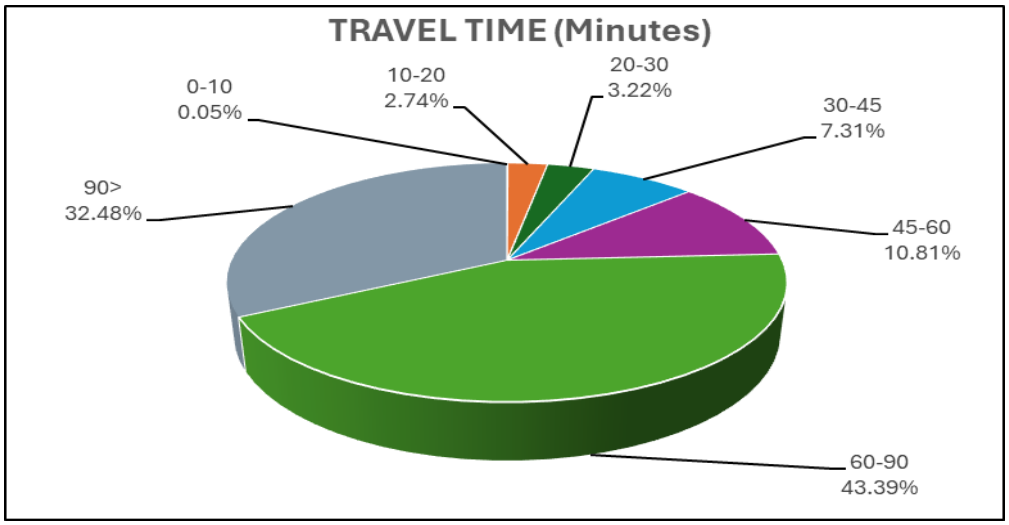
The analysis of travel time data, as presented in **TABLE 2.27** and **Figure 2.15**, indicates that approximately 6.02% of passengers have a travel time of up to 30 minutes. Around 61.51% of passengers have travel times ranging from 30 to 90 minutes, while 32.48% experience travel times exceeding 90 minutes.

TABLE 2.27: DISTRIBUTION OF OUTER CORDON PASSENGERS BY TRAVEL TIME

TIME	TRAVEL TIME (IN MIN)							TOTAL
	0-10	10-20	20-30	30-45	45-60	60-90	90>	
TOTAL	131	6764	7954	18055	26679	107103	80171	246857
(%)	0.05	2.74	3.22	7.31	10.81	43.39	32.48	100.00

*Source: RITES Primary Survey 2025

FIGURE 2.15: DISTRIBUTION OF OUTER CORDON PASSENGERS BY TRAVEL TIME



*Source: RITES Primary Survey 2025

The distribution of passengers by travel distance, as shown in **TABLE 2.28**, reveals that approximately 28.98% of passengers travel more than 90 km. Around 58.72% of passengers have trip lengths between 30 and 90 km, while 12.30% travel less than 30

km. Therefore, it can be observed that nearly 30% of trips originate from locations more than 90 km away, requiring over 90 minutes to reach their destination.

TABLE 2.28: DISTRIBUTION OF OUTER CORDON PASSENGERS BY TRAVEL DISTANCE

DISTANCE	TRAVEL DISTANCE (IN KM)							TOTAL
	0-10	10-20	20-30	30-45	45-60	60-90	90>	
TOTAL	744	7662	21958	36788	63305	44866	71535	246857
(%)	0.30	3.10	8.89	14.90	25.64	18.17	28.98	100.00

*Source: RITES Primary Survey 2025

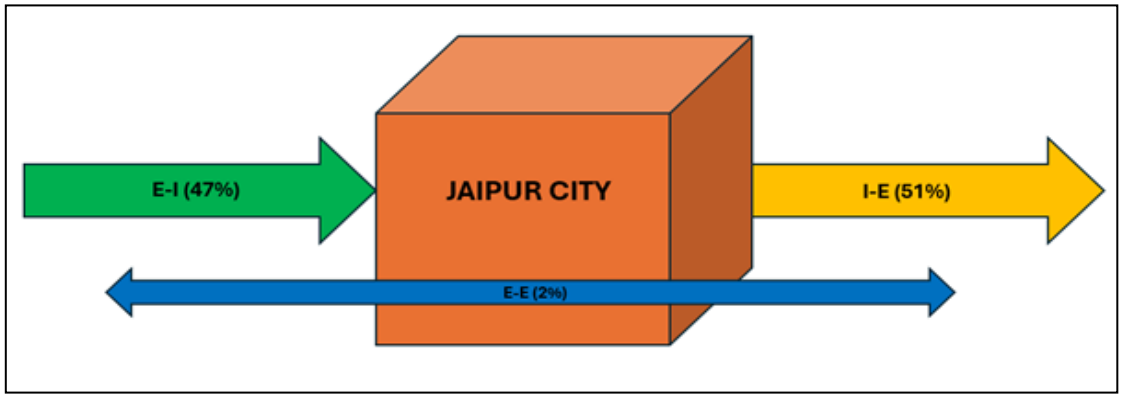
The distribution of passengers by travel mode, as presented in **TABLE 2.29,** shows that private vehicles are the predominant modes of travel with 49.24% trips by cars, while 45.20% trips by two-wheeler. The mode distribution for auto, bus, and mini-bus is 2.04%, 3.05%, and 0.47%, respectively.

TABLE 2.29: DISTRIBUTION OF OUTER CORDON PASSENGERS BY TRAVEL MODE

MODE	CAR	TWO-WHEELER	AUTO	BUS	MINI BUS	TOTAL
TOTAL	121543	111588	5030	7536	1159	246857
COMPOSITION %	49.24	45.20	2.04	3.05	0.47	100.00

*Source: RITES Primary Survey 2025

The trip characteristics analysis of passenger trips at the outer cordon points reveals that external to external trips are insignificant with only 2% share in total trips. This shows that the majority of the trips are either originating or destined in the city. **TABLE 2.30** shows the passenger travel pattern at outer cordon locations.



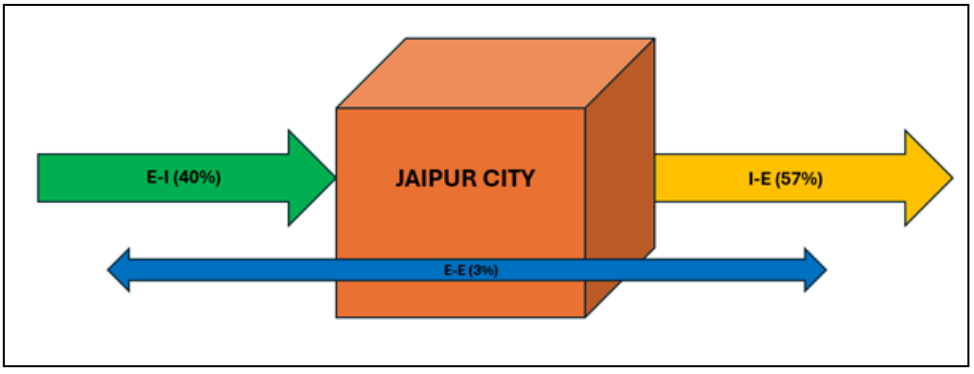
Maximum number of passenger trips in Jaipur (I-E) come from Nawalpura location (69%) followed by Kathawal (55%). Maximum E-I movement has been recorded on Chainpura (51%).

TABLE 2.30: DISTRIBUTION OF OUTER CORDON PASSENGER TRIPS BASED ON OD

S.NO.	NAME OF OUTER CORDON	TRIPS (I-E)	TRIPS (E-I)	TRIPS (E-E)	TOTAL
1	OC-01_TANKARDA	12923	12986	213	26122
		49%	**50%**	**1%**	**100%**
2	OC-02_CHOMU	27597	23587	372	51555
		54%	**46%**	**1%**	**100%**
3	OC-03_NAWALPURA	12699	5084	495	18277
		69%	**28%**	**3%**	**100%**
4	OC-04_ACHROL	2307	1802	234	4343
		53%	**41%**	**5%**	**100%**
5	OC-05_NAYABANS	2557	2739	153	5449
		47%	**50%**	**3%**	**100%**
6	OC-06_CHAIN PURA	23290	26353	1598	51241
		45%	**51%**	**3%**	**100%**
7	OC-07_DHINDHOL	12560	12210	336	25106
		50%	**49%**	**1%**	**100%**
8	OC-08_KATHAWAL	3773	2971	110	6854
		55%	**43%**	**2%**	**100%**
9	OC-09_HARSOOLIYA	4669	4831	521	10022
		47%	**48%**	**5%**	**100%**
10	OC-10_MOKHAMPURA	15247	15944	1095	32286
		47%	**49%**	**3%**	**100%**
11	OC-11_BASSI NAGA	7508	7709	386	15602
		48%	**49%**	**2%**	**100%**
GRAND TOTAL		**125131**	**116215**	**5512**	**246857**
		51%	**47%**	**2%**	**100%**

*Source: RITES Primary Survey, 2025

Data collected from Origin-Destination survey has been analyzed to study the movement pattern of freight vehicles at the outer cordon and presented in **TABLE 2.31.**



Maximum number of passenger trips in Jaipur (I-E) come from Nawalpura location (84%) followed by Kathawal (60%) and Dhindhol (60%). Maximum E-I movement has been recorded on Achrol (49%) & Mokhampura (49%). The E-E percentage share of vehicles is only 3%.

TABLE 2.31: DISTRIBUTION OF OUTER CORDON GOODS TRIPS BASED ON OD

S.No.	Name of Outer Cordon	Trips (I-E)	Trips (E-I)	Trips (E-E)	Total
1	OC-01_Tankarda	1447	978	31	2456
		59%	**40%**	**1%**	**100%**
2	OC-02_Chomu	12557	8976	0	21533
		58%	**42%**	**0%**	**100%**
3	OC-03_Nawalpura	7069	798	563	8429
		84%	**9%**	**7%**	**100%**
4	OC-04_Achrol	215	227	23	465
		46%	**49%**	**5%**	**100%**
5	OC-05_Nayabans	238	228	5	471
		51%	**48%**	**1%**	**100%**
6	OC-06_Chain Pura	4836	3412	413	8661
		56%	**39%**	**5%**	**100%**
7	OC-07_Dhindhol	957	602	35	1594
		60%	**38%**	**2%**	**100%**
8	OC-08_Kathawal	472	300	12	784
		60%	**38%**	**2%**	**100%**
9	OC-09_Harsooliya	579	598	215	1392
		42%	**43%**	**15%**	**100%**
10	OC-10_Mokhampura	10121	10769	1050	21940
		46%	**49%**	**5%**	**100%**
11	OC-11_Bassi Naga	774	667	38	1479
		52%	**45%**	**3%**	**100%**
Grand Total		**39265**	**27555**	**2385**	**69204**
		57%	**40%**	**3%**	**100%**

*Source: RITES Primary Survey, 2025

2.7. TERMINAL SURVEYS AT BUS TERMINAL

The boarding/ alighting and OD survey was conducted at the Sindhi Camp Bus Terminal. The boarding and alighting data for passengers are presented in **TABLE 2.32.** The table shows that Sindhi Camp terminal is handling total daily passengers of about 54,000 with boarding passengers of 37,778 and alighting passengers of 16,393. The peak passenger movement occurs between 18:30 and 19:30 in the evening, during which nearly 6.7% of the daily movement (3,671 passengers) is observed.

TABLE 2.32: PASSENGER BOARDING ALIGHTING DATA AT BUS TERMINAL

S. NO	NAME OF BUS TERMINAL	TOTAL BOARDING	TOTAL ALIGHTING	TOTAL B+A	PEAK TIME	PEAK HOUR BOARDING	PEAK HOUR ALIGHTING	PEAK HOUR B+A
1	**SINDHI CAMP**	37778	16393	54171	18:30-19:30	2567	1104	3671

*Source: RITES Primary Survey 2025

An Origin-Destination (OD) survey was conducted at the Sindhi Bus Terminal, revealing that Passengers traveling for work and business purpose contribute to 12.51% and 27.29%, respectively (as shown in **TABLE 2.33** and **Figure 2.16)**. Educational trips make

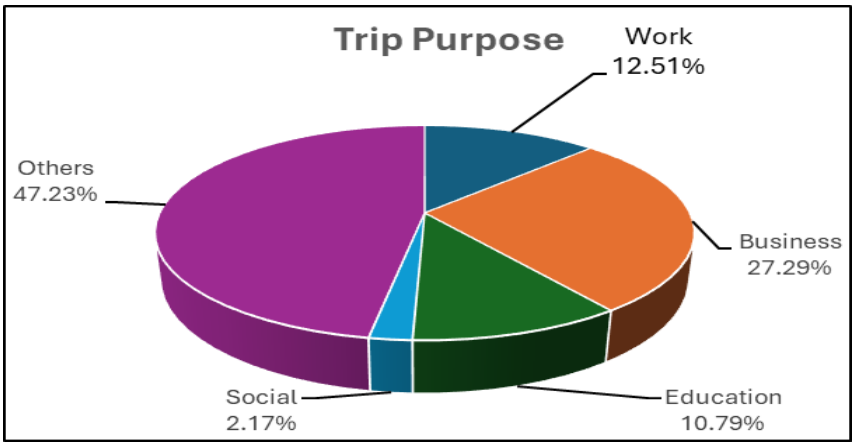
up approximately 10.79%, while social trips account for 2.17%. The other trips including recreational, tourism, religious and shopping trips have major share of about 47%.

TABLE 2.33: DISTRIBUTION OF BUS TERMINAL PASSENGERS BY TRIP PURPOSE

PURPOSE	WORK	BUSINESS	EDUCATION	SOCIAL	OTHERS	TOTAL
TOTAL	6751	14726	5820	1172	25482	53950
COMPOSITION %	12.51	27.29	10.79	2.17	47.23	100.00

*Source: RITES Primary Survey 2025

FIGURE 2.16: DISTRIBUTION OF BUS TERMINAL PASSENGERS BY TRIP PURPOSE



The analysis of travel frequency, as shown in **TABLE 2.34,** indicates that approximately 4.17% of passengers travel daily, 13.85% travel weekly, 45.23% travel monthly, and 36.75% travel occasionally.

TABLE 2.34: DISTRIBUTION OF BUS TERMINAL PASSENGERS BY FREQUENCY

FREQUENCY	DAILY	WEEKLY	MONTHLY	OCCASIONALLY	TOTAL
TOTAL	2248	7472	24402	19828	53950
(%)	4.17	13.85	45.23	36.75	100.00

*Source: RITES Primary Survey 2025

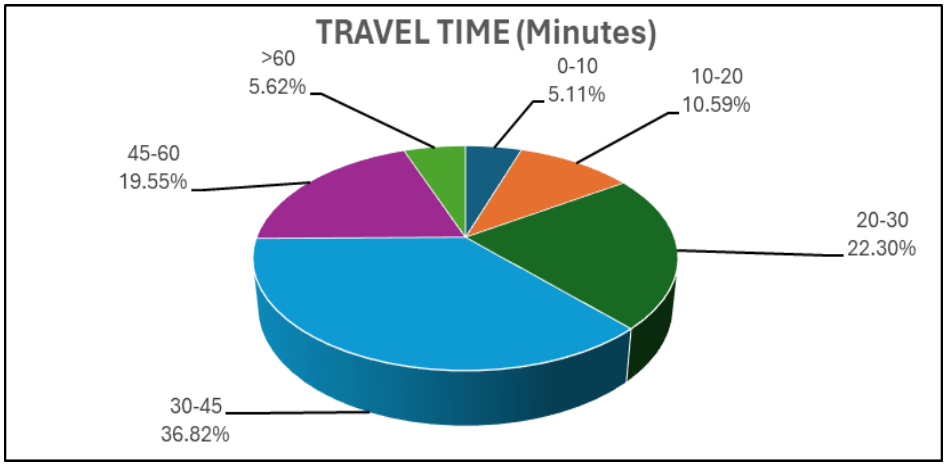
The analysis of travel time data, as presented in **TABLE 2.35** and **Figure 2.17** shows that approximately 38% of passengers take travel time of up to 30 minutes to reach bus terminal. About 56.38% of passengers travel for 30 to 60 minutes, while 11.53% have a travel time exceeding 60 minutes.

TABLE 2.35: DISTRIBUTION OF BUS TERMINAL PASSENGERS BY TRAVEL TIME

TIME	TRAVEL TIME (IN MIN)						TOTAL
	0-10	10-20	20-30	30-45	45-60	>60	
TOTAL	2759	5713	12030	19866	10549	3034	53950
(%)	5.11	10.59	22.30	36.82	19.55	5.62	100.00

*SOURCE: RITES PRIMARY SURVEY 2025

FIGURE 2.17: DISTRIBUTION OF BUS TERMINAL PASSENGERS BY TRAVEL TIME



*Source: RITES Primary Survey 2025

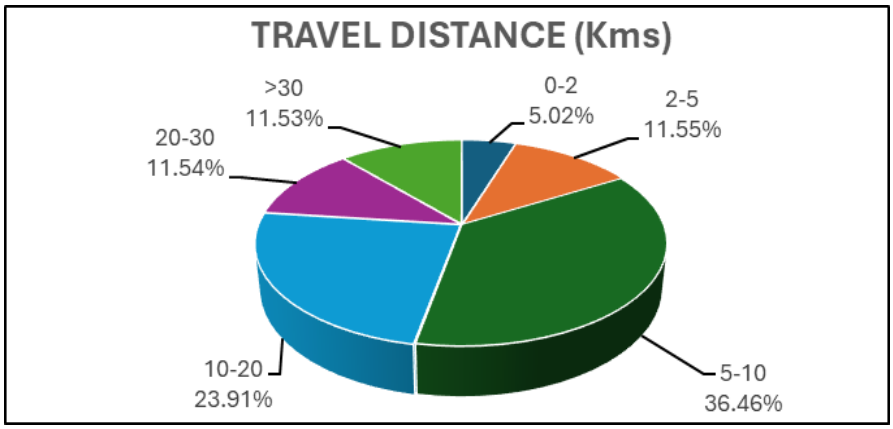
The distribution of passengers by distance traveled to reach the bus terminal, as shown in **Table 2.36** and **Figure 2.18,** reveals that approximately 11.53% of passengers travel more than 30 km. About 35.45% of passengers travel between 10 and 30 km, while 53.02% have a trip length of less than 10 km.

TABLE 2.36: DISTRIBUTION OF BUS TERMINAL PASSENGERS BY DISTANCE TRAVELLED

DISTANCE	TRAVEL DISTANCE (IN KM)						TOTAL
	0-2	2-5	5-10	10-20	20-30	>30	
TOTAL	2706	6230	19669	12898	6225	6222	53950
(%)	5.02	11.55	36.46	23.91	11.54	11.53	100.00

*Source: RITES Primary Survey 2025

FIGURE 2.18: DISTRIBUTION OF BUS TERMINAL PASSENGERS BY DISTANCE TRAVELLED



*Source: RITES Primary Survey 2025

The distribution of passengers by travel mode to reach the bus terminal, as shown in **Table 2.37,** indicates that about 57% of the passengers use private modes including cars/ taxis and two wheelers to reach bus terminal while only 8% passengers use city buses. About 35% use Autos and E-rickshaw and 0.78% by metro.

TABLE 2.37: DISTRIBUTION OF BUS TERMINAL PASSENGERS BY TRAVEL MODE

TRAVEL MODE											
MODE	CAR	TAXI	2-WHEELER	AUTO	E-RICKSHAW	BUS	METRO	CYCLE	CYCLE RICKSHAW	WALK	TOTAL
TOTAL	18336	623	11651	8999	9603	4257	420	27	7	27	53950
(%)	33.99	1.16	21.60	16.68	17.80	7.89	0.78	0.05	0.01	0.05	100.00

*Source: RITES Primary Survey 2025

The cost incurred by passengers to reach the bus terminal, as presented in **Table 2.38**, shows that 23.13% of passengers spend more than Rs. 100, while 38.97% pay between Rs. 30 and Rs. 100. Approximately 37.90% of passengers spend less than Rs. 30.

TABLE 2.38: DISTRIBUTION OF BUS TERMINAL PASSENGERS BY TRAVEL COST

COST	TRAVEL COST						TOTAL
	0-10	10-20	20-30	30-50	50-100	>100	
TOTAL	4216	11318	4914	5856	15168	12476	53950
(%)	7.82	20.98	9.11	10.86	28.12	23.13	100.00

*Source: RITES Primary Survey 2025

2.8. TERMINAL SURVEYS AT RAILWAY STATION

The boarding/alighting and OD survey was conducted at the Gandhi Nagar Railway Station and Jaipur Junction Railway Station. The boarding alighting data for passengers is presented in **TABLE 2.39.** The daily data of passenger movement shows that total movement of passengers in Jaipur is 1,18,181 which is almost 350% more than the passenger movement in Gandhi Nagar i.e. 33,687. The peak hour passengers in Gandhi Nagar is 4335 while in Jaipur junction, it is 8014 passengers.

TABLE 2.39: PASSENGER BOARDING ALIGHTING DATA AT RAILWAY STATION

SN	NAME OF TERMINAL	TOTAL BOARDING	TOTAL ALIGHTING	TOTAL B+A	PEAK HOUR BOARDING	PEAK HOUR ALIGHTING	PEAK HOUR B+A
1	GANDHI NAGAR RAILWAY STATION	17306	16381	33687	1550	2785	4335
2	JAIPUR JUNCTION	68089	50092	118181	4966	3048	8014
TOTAL		85395	66473	151868	6516	5833	12349

*Source: RITES Primary Survey 2025

An OD survey was conducted at the railway stations. The distribution of trips by purpose is shown in **TABLE 2.40**. Passengers traveling for work and business purposes contribute to 6.01% and 23.20%, respectively. Educational trips make up approximately 10.32%, while social trips account for 1.89%. The other trips including recreational, tourism, religious and shopping trips have major share of about 59%.

TABLE 2.40: DISTRIBUTION OF RAILWAY STATION PASSENGERS BY TRIP PURPOSE

PASSENGER TRIPS	WORK	BUSINESS	EDUCATION	SOCIAL	OTHERS	TOTAL
TOTAL	9115	35194	15647	2873	88849	151678
%	6.01	23.20	10.32	1.89	58.58	100

*Source: RITES Primary Survey 2025

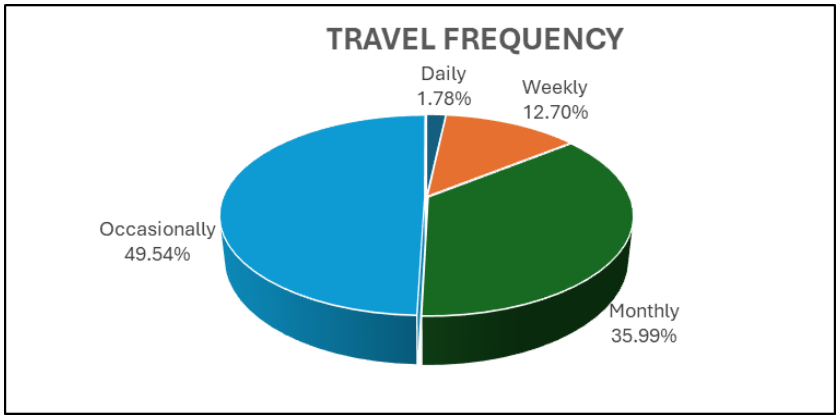
The analysis of travel frequency, as shown in **TABLE 2.41** and **Figure 2.19**, indicates that approximately 1.78% of passengers travel daily, 12.70% travel weekly, 35.99% travel monthly, and 49.54% travel occasionally.

TABLE 2.41: DISTRIBUTION OF RAILWAY STATION PASSENGERS BY FREQUENCY

PASSENGER TRIPS	DAILY	WEEKLY	MONTHLY	OCCASIONALLY	TOTAL
TOTAL	2696	19257	54586	75138	151678
(%)	1.78	12.70	35.99	49.54	100.00

*Source: RITES Primary Survey 2025

FIGURE 2.19: DISTRIBUTION OF RAILWAY STATION PASSENGERS BY FREQUENCY



*Source: RITES Primary Survey 2025

The analysis of travel time data, as presented in **TABLE 2.42,** shows that approximately 39.41% of passengers have a travel time of up to 30 minutes to reach railway station. About 50.91% of passengers have a travel time ranging from 30 to 60 minutes, while 9.68% experience travel times exceeding 60 minutes.

TABLE 2.42: DISTRIBUTION OF RAILWAY STATION PASSENGERS BY TRAVEL TIME

PASSENGER TRIPS	TRAVEL TIME (IN MIN)						TOTAL
	0-10	10-20	20-30	30-45	45-60	>60	
TOTAL	7527	23905	28347	43177	34038	14685	151678
(%)	4.96	15.76	18.69	28.47	22.44	9.68	100.00

*Source: RITES Primary Survey 2025

The distribution of passengers by travel distance to reach the railway station, as shown in **TABLE 2.43,** reveals that approximately 9.97% of passengers travel more than 30 km. About 45.78% of passengers travel between 10 and 30 km, while 44.25% travel less than 10 km.

TABLE 2.43: DISTRIBUTION OF RAILWAY STATION PASSENGERS BY DISTANCE TRAVELLED

PASSENGER TRIPS	TRAVEL DISTANCE (IN KM)						TOTAL
	0-2	2-5	5-10	10-20	20-30	>30	
TOTAL	12568	26263	28288	44576	24861	15121	151678
(%)	8.29	17.32	18.65	29.39	16.39	9.97	100.00

*Source: RITES Primary Survey 2025

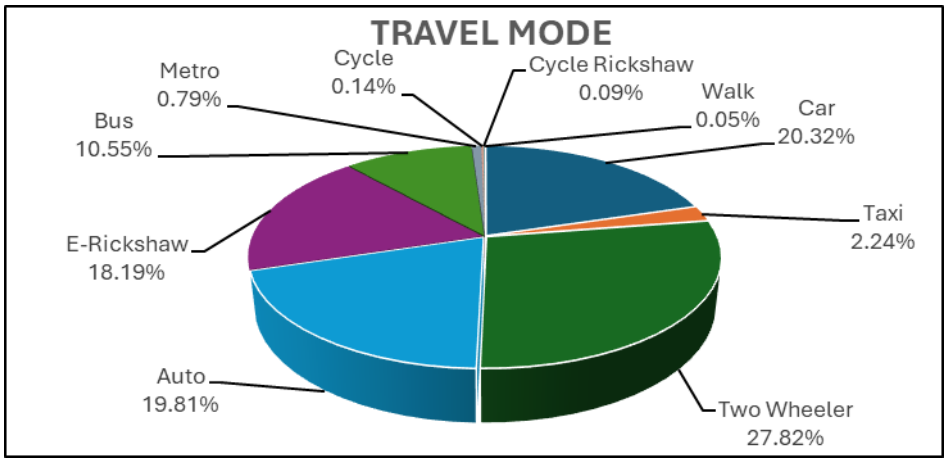
The distribution of passengers by travel mode to reach the railway station, as shown in **TABLE 2.44** and **Figure 2.20**, indicates that about 50% of the passengers use private modes including cars/ taxis and two wheelers to reach railway station while only 11% passengers use city buses. About 38% use Autos and E-rickshaw and 0.79% by metro.

TABLE 2.44: DISTRIBUTION OF RAILWAY STATION PASSENGERS BY TRAVEL MODE

PASSENGER TRIPS	CAR	TAXI	2-WHEELER	AUTO	E-RICKSHAW	BUS	METRO	CYCLE	CYCLE RICKSHAW	WALK
TOTAL	30828	3400	42196	30044	27596	15997	1197	212	136	73
(%)	20.32	2.24	27.82	19.81	18.19	10.55	0.79	0.14	0.09	0.05

*Source: RITES Primary Survey 2025

FIGURE 2.20: DISTRIBUTION OF RAILWAY STATION PASSENGERS BY TRAVEL MODE



*Source: RITES Primary Survey 2025

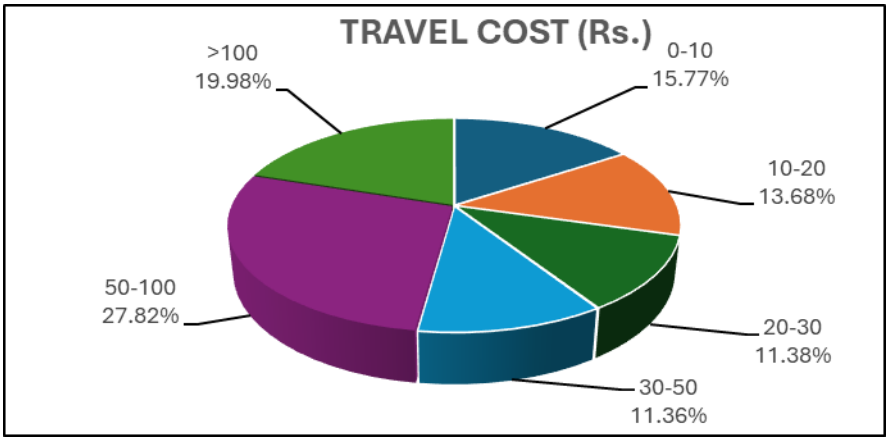
The cost incurred by passengers to reach the railway station, as shown in **TABLE 2.45** and **Figure 2.21**, reveals that 19.98% of passengers spend more than Rs. 100, while 39.18% pay between Rs. 30 and Rs. 100. Approximately 40.83% of passengers spend less than Rs. 30.

TABLE 2.45: DISTRIBUTION OF RAILWAY STATION PASSENGERS BY TRAVEL COST

	TRAVEL COST (RS.)						
PASSENGER TRIPS	0-10	10-20	20-30	30-50	50-100	>100	TOTAL
TOTAL	23918	20754	17265	17227	42203	30312	151678
(%)	15.77	13.68	11.38	11.36	27.82	19.98	100.00

*Source: RITES Primary Survey 2025

FIGURE 2.21: DISTRIBUTION OF RAILWAY STATION PASSENGERS BY TRAVEL COST



2.9. TERMINAL SURVEYS AT AIRPORT TERMINAL

The boarding/alighting and OD survey was conducted at Jaipur International Airport. The boarding and alighting data for passengers are presented in **TABLE 2.46**. The daily passenger movement data shows a total of 10,153 boarding and 13,321 alighting. The peak passenger movement occurs between 19:15 and 20:15 in the evening, during which approximately 6.2% of the daily movement (1,468 passengers) takes place.

TABLE 2.46: PASSENGER BOARDING ALIGHTING DATA AT AIRPORT

LOCATION	TOTAL BOARDING	TOTAL ALIGHTING	TOTAL B+A	PEAK TIME	PEAK HOUR BOARDING	PEAK HOUR ALIGHTING	PEAK HOUR B+A
JAIPUR INTERNATIONAL AIRPORT	10153	13321	23474	19:15-20:15	554	914	1468

*Source: RITES Primary Survey 2025

The distribution of trips by purpose is shown in **TABLE 2.47.** Passengers traveling for work and business purposes contribute 15.18% and 21.56%, respectively. Educational trips account for approximately 10.71%, while social trips make up 2.26%. The other trips including recreational, tourism, religious and shopping trips have major share of about 50%.

TABLE 2.47: DISTRIBUTION OF AIRPORT PASSENGERS BY TRIP PURPOSE

PASSENGER TRIPS	WORK	BUSINESS	EDUCATION	SOCIAL	OTHERS	TOTAL
TOTAL	3549	5041	2505	528	11762	23384
%	15.18	21.56	10.71	2.26	50.30	100.00

*Source: RITES Primary Survey 2025

The analysis of travel frequency, as presented in **TABLE 2.48,** indicates that approximately 6.25% of passengers travel weekly, 17.09% travel monthly, and 76.66% travel occasionally.

TABLE 2.48: DISTRIBUTION OF AIRPORT PASSENGERS BY FREQUENCY

PASSENGER TRIPS	WEEKLY	MONTHLY	OCCASIONALLY	TOTAL
TOTAL	1460	3997	17927	23384
(%)	6.25	17.09	76.66	100.00

*Source: RITES Primary Survey 2025

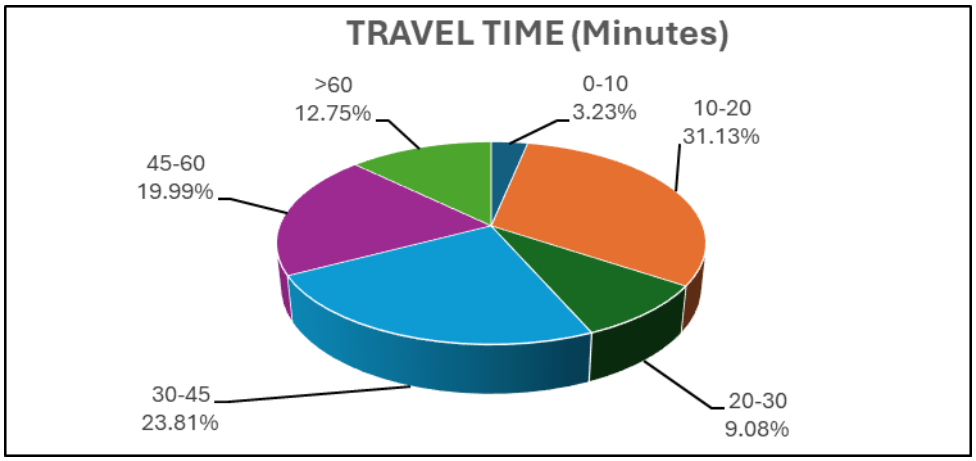
The analysis of travel time data, as presented in **TABLE 2.49** and **Figure 2.22,** shows that approximately 43.44% of passengers take travel time of up to 30 minutes to reach airport. About 43% of passengers travel between 30 and 60 minutes, while 12.75% have a travel time exceeding 60 minutes.

TABLE 2.49: DISTRIBUTION OF AIRPORT PASSENGERS BY TRAVEL TIME

PASSENGER TRIPS	TRAVEL TIME (IN MIN)						TOTAL
	0-10	10-20	20-30	30-45	45-60	>60	
TOTAL	755	7280	2124	5569	4673	2983	23384
(%)	3.23	31.13	9.08	23.81	19.99	12.75	100.00

*Source: RITES Primary Survey 2025

FIGURE 2.22: DISTRIBUTION OF AIRPORT PASSENGERS BY TRAVEL TIME



*Source: RITES Primary Survey 2025

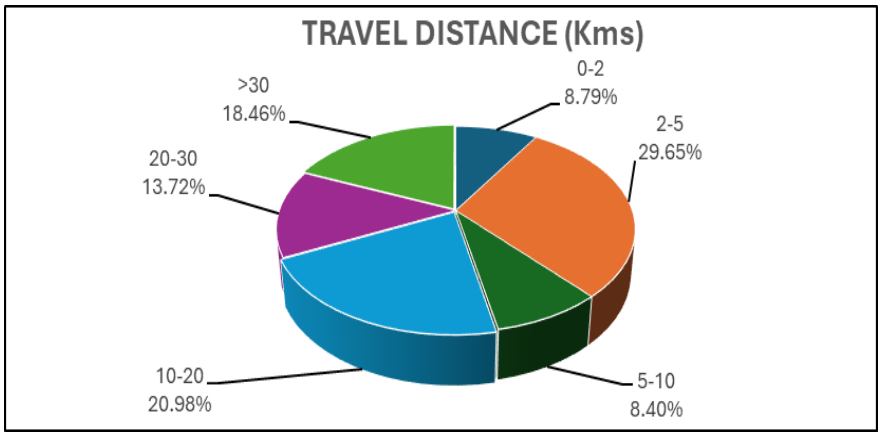
The distribution of passengers by distance traveled to reach the airport, as shown in **TABLE 2.50** and **Figure 2.23,** reveals that approximately 18.46% of passengers travel more than 30 km. About 34.70% of passengers travel between 10 and 30 km, while 46.84% travel less than 10 km.

TABLE 2.50: DISTRIBUTION OF AIRPORT PASSENGERS BY DISTANCE TRAVELLED

PASSENGER TRIPS	TRAVEL DISTANCE (IN KM)						TOTAL
	0-2	2-5	5-10	10-20	20-30	>30	
TOTAL	2055	6933	1964	4906	3208	4318	23384
(%)	8.79	29.65	8.40	20.98	13.72	18.46	100.00

*Source: RITES Primary Survey 2025

Figure 2.23: DISTRIBUTION OF AIRPORT PASSENGERS BY DISTANCE TRAVELLED



*Source: RITES Primary Survey 2025

2.10. TERMINAL SURVEYS AT METRO STATIONS

The boarding/alighting and OD survey was conducted at all the operational metro stations. The boarding and alighting data for passengers are presented in **TABLE 2.51.** The daily passenger movement data shows that the highest boarding and alighting occurs at Badi Chaupar Metro Station, with 13,621 passengers, followed by 13,511 passengers at New Aatish Metro Station. The peak hour movement data indicates that the highest rush occurs during the morning and evening hours, when office, school, and college commuters travel the most. The peak hour movement at New Aatish Metro Station is 1,974 passengers, followed by 1,223 at Badi Chaupar.

TABLE 2.51: PASSENGER BOARDING ALIGHTING DATA AT METRO STATIONS

S. NO	NAME OF METRO STATION	TOTAL BOARDING	TOTAL ALIGHTING	TOTAL B+A	PEAK TIME	PEAK HOUR BRDG.	PEAK HOUR ALTG.	PEAK HOUR B+A
1	Badi Chaupar Metro Station	6707	6914	13621	1745 - 1845	653	570	1223
2	Choti Chaupar Metro Station	1571	1434	3005	1830 - 1930	188	172	360
3	Chandpole Metro Station	561	1342	1903	1715 - 1815	52	132	184
4	Sindhi Camp Metro Station	2890	2748	5638	0900 - 1000	309	234	543
5	Railway Station Metro	1237	2920	4157	1830 - 1930	139	320	459
6	Civil line Metro Station	2104	1602	3706	0930 - 1030	158	207	365
7	Ramnagar Metro Station	1198	1217	2415	1745 - 1845	135	149	284
8	Shyam Nagar Metro Station	1090	985	2075	1800 - 1900	137	110	247
9	Vivek Vihar Metro Station	1493	1190	2683	1800 - 1900	148	138	286
10	New Aatish Metro Station	6635	6876	13511	1400 - 1500	1340	634	1974
11	Mansarovar Metro Station	1601	3892	5493	1830 - 1930	128	427	555
Total		27087	31120	58207		3387	3093	6480

*Source: RITES Primary Survey 2025

The distribution of passengers by trip purpose indicate that the majority of trips are for work-related purposes, accounting for 40.26% (**TABLE 2.52**, **Figure 2.24**). Business-related trips make up to 18.54% of the total trips. Educational trips represent

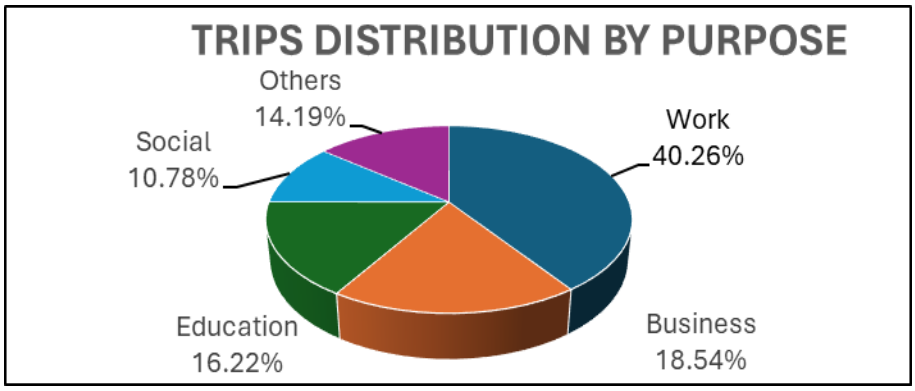
approximately 16.22%, while social trips and other trips contribute 10.78% and 14.19%, respectively.

TABLE 2.52: DISTRIBUTION OF METRO PASSENGERS BY PURPOSE

PASSENGER TRIPS	WORK	BUSINESS	EDUCATION	SOCIAL	OTHERS	TOTAL
TOTAL	23477	10810	9458	6288	8277	58310
%	40.26	18.54	16.22	10.78	14.19	100.00

*Source: RITES Primary Survey 2025

FIGURE 2.24: DISTRIBUTION OF METRO PASSENGERS BY PURPOSE



*Source: RITES Primary Survey 2025

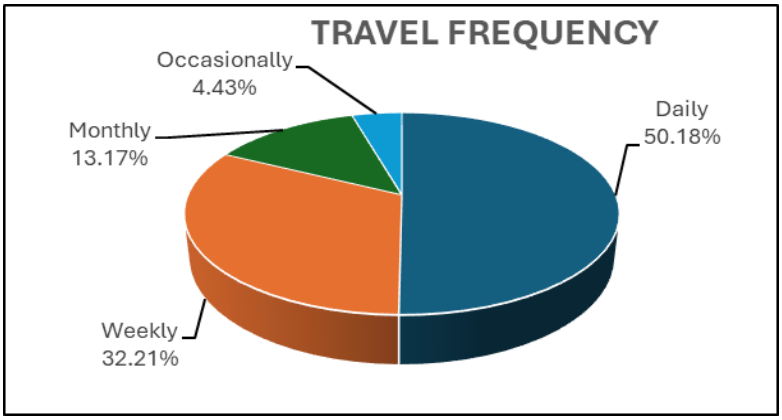
The analysis of travel frequency indicates that approximately 50.18% of passengers travel on a daily basis, 32.21% travel weekly, 13.17% travel monthly, and 76.66% travel occasionally (**TABLE 2.53, Figure 2.25**).

TABLE 2.53: DISTRIBUTION OF METRO PASSENGERS BY FREQUENCY

PASSENGER TRIPS	DAILY	WEEKLY	MONTHLY	OCCASIONALLY	TOTAL
TOTAL	29262	18782	7682	2584	58310
(%)	50.18	32.21	13.17	4.43	100.00

*Source: RITES Primary Survey 2025

FIGURE 2.25: DISTRIBUTION OF METRO PASSENGERS BY FREQUENCY



*Source: RITES Primary Survey 2025

The analysis of passenger travel time data reveals that approximately 92.20% of passengers have a travel time of up to 30 minutes, while the remaining 7.08% experience travel times ranging from 30 to 60 minutes **(TABLE 2.54).**

TABLE 2.54: DISTRIBUTION OF METRO PASSENGERS BY TIME TRAVELLED

PASSENGER TRIPS	TRAVEL TIME (IN MIN)						TOTAL
	0-10	10-20	20-30	30-45	45-60	>60	
TOTAL	19197	22938	11625	2361	1766	423	58310
(%)	32.92	39.34	19.94	4.05	3.03	0.73	100.00

*Source: RITES Primary Survey 2025

The distribution of passengers by the distance traveled to reach the Metro station is presented in **TABLE 2.55.** It is observed that approximately 58.15% of passengers travel between 2-5 km. About 34.41% of passengers travel a distance ranging from 0 to 2 km, while 7.44% of passengers travel between 5 to 10 km.

TABLE 2.55: DISTRIBUTION OF METRO PASSENGERS BY DISTANCE TRAVELLED

PASSENGER TRIPS	TRAVEL DISTANCE (IN KM)			TOTAL
	0-2	2-5	5-10	
TOTAL	20065	33909	4335	58310
(%)	34.41	58.15	7.44	100.00

*Source: RITES Primary Survey 2025

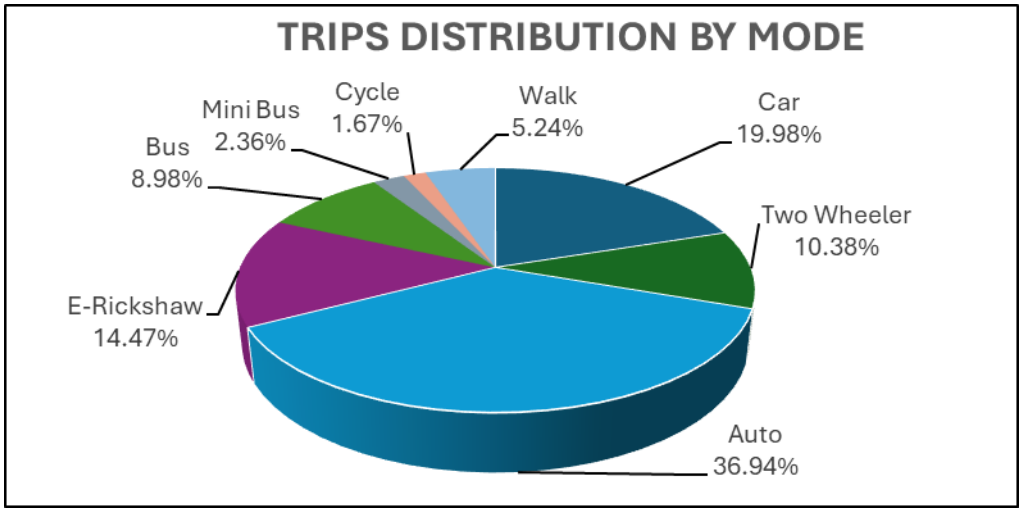
The distribution of passengers by travel mode to reach the Metro station is presented in (**TABLE 2.56**, **Figure 2.26**). It is observed that 36.94% of passengers use auto rickshaws while 14.47% use e-rickshaws. About 30% of passengers use private modes (cars & 2-wh) to reach metro station while about 11% use Bus & Minibus.

TABLE 2.56: DISTRIBUTION OF METRO PASSENGERS BY TRAVEL MODE

PASSENGER TRIPS	TRAVEL MODE							
	CAR	TWO-WHEELER	AUTO	E-RICKSHAW	BUS	MINIBUS	CYCLE	WALK
TOTAL	11648	6053	21538	8435	5234	1376	972	3054
(%)	19.98	10.38	36.94	14.47	8.98	2.36	1.67	5.24

*Source: RITES Primary Survey 2025

FIGURE 2.26: DISTRIBUTION OF METRO PASSENGERS BY TRAVEL MODE



*Source: RITES Primary Survey 2025

The cost incurred by passengers to reach the Metro station is presented in **TABLE 2.57**. It is observed that 23.13% of passengers spend more than Rs. 100, while 38.97% pay between Rs. 30 and Rs. 100. Additionally, 37.90% of passengers spend less than Rs. 30.

TABLE 2.57: DISTRIBUTION OF METRO PASSENGERS BY TRAVEL COST

PASSENGER TRIPS	TRAVEL COST (RS.)						TOTAL
	0-10	10-20	20-30	30-50	50-100	>100	
TOTAL	4216	11318	4914	5856	15168	12476	**53950**
(%)	7.82	20.98	9.11	10.86	28.12	23.13	**100.00**

*Source: RITES Primary Survey 2025

2.11. PEDESTRIAN COUNT SURVEY

The pedestrian volume counts have been carried out at major junctions as shown in **Figure 2.27** throughout the city. The daily and peak hour pedestrian flows at various survey locations are presented in **TABLE 2.58.**

A comprehensive 16-hour pedestrian volume survey was conducted across major urban corridors and intersections in Jaipur to evaluate walkability, safety, and infrastructure needs. The findings reveal a wide range of pedestrian activity, both in terms of daily and peak hour volumes, across different locations.

Key high-footfall areas include Chomu Puliya, Chandpole, Badi Chaupar, Ramganj Chaupar, and Kishan Ghar, with daily pedestrian volumes exceeding 5,000 in either the across or along direction. Notably, Chomu Puliya recorded the highest daily “across” pedestrian movement at 5,362, while Chandpole observed the highest “along” pedestrian flow at 5,302. These figures underscore the importance of prioritizing pedestrian safety and flow efficiency in these areas.

Ramganj Chaupar registered the highest peak with a combined across and along movement of over 1,700 pedestrians during the evening peak hour. Similarly, Badi Chaupar and Choti Chaupar experienced significant evening peak volumes, indicating strong bi-directional pedestrian surges during return or market hours. Across most surveyed locations, evening peaks were generally higher than morning peaks, reflecting the city's commercial activity patterns and post-work hour footfalls.

Narayan Singh Circle, Sanganer Junction, and Vidhyadhar Nagar, observed Moderate yet consistent pedestrian flows while Jawahar Circle, Sahkar Bhawan, and Gandhi Circle exhibited relatively lower pedestrian volumes.

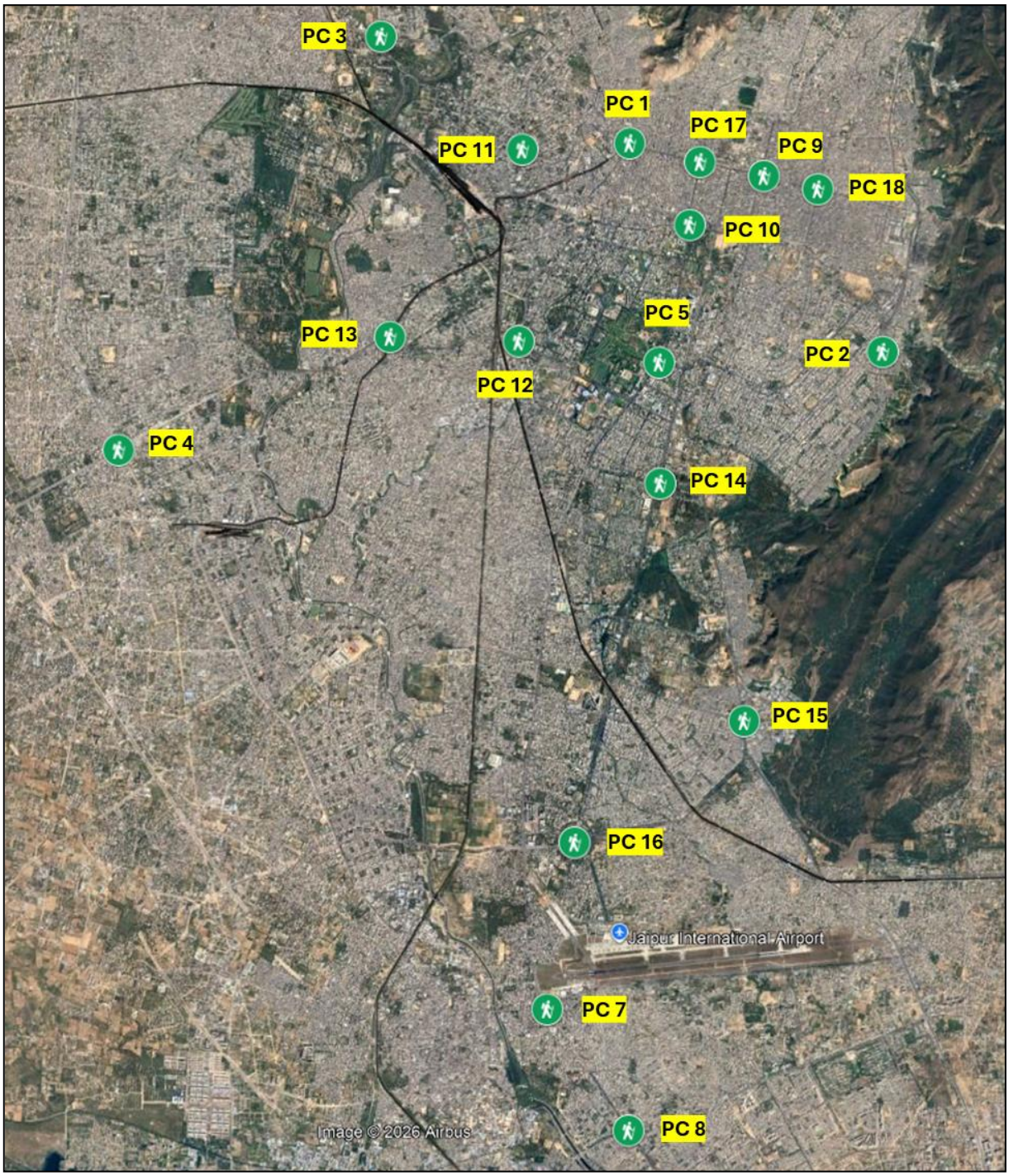
TABLE 2.58: DAILY & PEAK HOUR PEDESTRIAN TRAFFIC

S. NO.	NAME OF LOCATION	APPROACH	DAILY PEDESTRIAN VOL. – BOTH SIDE (16 HOURS)		PEAK HOUR PEDESTRIAN VOL. (MORNING PEAK)		PEAK HOUR PEDESTRIAN VOL. (EVENING PEAK)	
			ACROSS	ALONG	ACROSS	ALONG	ACROSS	ALONG
1	Chandpole	Sindhi Camp	911	5302	60	410	101	437
		Mali Colony	783	3398	40	349	82	238
		Choti Chaupar	758	4202	52	316	80	349
2	Rotary Circle	Agra Road	31	236	1	10	3	17
		Transport Nagar	1039	3457	98	411	31	331
		Malviya Nagar	269	3695	36	294	22	353
3	Chomu Puliya	Chandpole	5362	1129	505	44	524	82
		Ajay Circle	2989	1338	325	186	310	79
		Road No 14	3642	1041	390	90	307	67
4	Ajmer Road Chauraha	Delhi	1372	2213	90	198	138	307
		Sindhi Camp	1001	1685	56	178	41	97
		Mansarover	3816	1441	275	121	288	109
		Kishan Ghar	5124	1920	392	151	552	191
5	Narayan Singh Circle	Ram Bagh	2871	3184	235	190	303	217
		Ajmeri Gate	3912	4083	441	305	283	406
		Kamra Mohalla	2406	2693	191	201	225	135
6	200ft By Pass Chowk	Chomu Puliya	860	1139	104	66	95	53
		Daulatpur	1187	1318	122	169	50	100
		Khirni Phata	2983	1203	278	121	159	56
		Chomu	3363	4620	257	464	226	511
7	Jawahar Circle	Airport Road	312	329	35	18	37	32
		Jawahar Circle	342	1629	39	100	20	187
		Bypass	428	972	33	80	38	87
		JLN	882	3192	61	194	57	277
		Ram Das Marg	815	999	86	67	99	60
		Terminal	257	839	14	57	18	112
8	Haldi Ghati	Haldi Ghati	2272	2669	221	216	283	214
		Bambala	1398	4364	124	482	100	333
		Choki Dhani	4444	416	515	14	272	35
		Sanganer	2268	1812	198	304	183	136
9	Badi Chaupar	Hawa Mahal Road	794	279	752	280	986	334
		Surajpole Gate	893	259	973	268	1183	339
		Saganeri Gate	1104	287	1216	294	741	299
		Pink City	616	287	588	387	719	265
10	Ajmeri Gate	Rajmandir Cinema	286	99	308	104	0	0
		Choti Chaupar	234	108	454	73	0	0
		Teransport Nagar Flyover	490	108	480	152	0	0
		Ajmeri Gate	90	93	124	98	0	0
11	Collectorate	Kanti Nagar	362	93	124	22	89	18

S. NO.	NAME OF LOCATION	APPROACH	DAILY PEDESTRIAN VOL. – BOTH SIDE (16 HOURS)		PEAK HOUR PEDESTRIAN VOL. (MORNING PEAK)		PEAK HOUR PEDESTRIAN VOL. (EVENING PEAK)	
			ACROSS	ALONG	ACROSS	ALONG	ACROSS	ALONG
		Sen Colony	239	126	287	93	101	73
		Subhash Nagar	763	88	184	40	189	99
		Shastri Nagar Circle	341	190	92	55	54	21
		Bani park	912	132	77	38	29	8
12	Sahkar Bhawan Circle	Bais Godam Flyover	89	122	138	197	0	0
		Sardar Patel Marg	216	105	412	55	0	0
		Shankar Marg	259	75	207	78	0	0
		Ambedkar Circle	91	95	99	169	0	0
13	Hawa Sadak Road	Vidyut Nagar	156	76	253	110	534	149
		Civil Line	75	75	190	116	162	103
		Ram Nagar Metro Station	123	58	223	73	259	85
		Bais Godam Flyover	117	79	155	107	142	182
14	Gandhi Circle	Talwandi	31	21	111	72	27	13
		MINT junction	33	26	50	26	22	12
		University Of Rajsthan	195	6	347	17	225	38
		Krishna Nagar-1	358	21	799	24	66	9
15	Apex Circle	Malviya Nagar	346	60	419	125	439	170
		Patrika Gate	249	70	208	66	359	94
		Jhalana Gram	172	95	150	112	220	157
		Kendriya Vidhyalaya	73	44	243	89	336	89
16	Sanganer Junction	Choti Chupar	211	198	337	203	435	203
		Sanganer Stadium	298	129	382	170	337	247
		Vidhyadhar Nagar	343	150	451	213	669	329
		Pratap Nagar	365	227	457	170	544	244
17	Choti Chaupar	Gangotri Bazar Road	577	246	591	250	1176	255
		Chandpole Bazar Road	519	402	545	399	614	464
		Badi Choupar	531	279	508	270	1355	401
		Kishanpole Bazar Road	824	395	840	422	586	420
18	Ramganj Chaupar	Nawab Ka Chowraha	383	343	378	317	1046	665
		Badi Chaupar	126	374	158	353	390	356
		Dayanand Marg	265	139	306	148	560	194
		Galta Gate	290	244	296	341	650	383

*Source: RITES Primary Survey 2025

FIGURE 2.27: PEDESTRIAN SURVEY LOCATIONS



2.12. WILLINGNESS TO PAY/USE SURVEYS

This section focuses on the opinions of users regarding various characteristics of the public transport system in Jaipur. Respondents at the air terminal and PT/IPT stops were surveyed to assess their preferences for an effective public transport system, as well as the additional fare they are willing to pay for improved services.

i. Willingness to Pay Survey at Air Terminal

The survey conducted at the Airport reveals that 92.29% of passengers are willing to shift to the MRTS to save on travel time. The willingness to pay an extra fare for good public transport (PT) services to reach the airport is presented in (**TABLE 2.59**). The findings show that 14.02% of respondents prefer the fare for the new public transport system to remain the same as the existing fare. Meanwhile, 71.60% are willing to pay up to Rs. 15 extra for improved transport facilities to reach the airport, and 14.38% are willing to pay more than Rs. 15 for better services.

TABLE 2.59: WILLINGNESS TO PAY EXTRA FARE FOR REACHING AIRPORT

PASSENGER TRIPS	EXTRA FARE (RS.)								TOTAL
	SAME FARE	0-2	2-5	5-10	10-15	15-20	20-25	25>	
TOTAL	3279	569	1600	6450	8125	1326	1338	697	**23384**
(%)	14.02	2.43	6.84	27.58	34.75	5.67	5.72	2.98	**100.00**

*Source: RITES Primary Survey 2025

ii. Willingness to Pay Survey at PT/IPT Stops

The survey conducted at PT/IPT stops regarding acceptable time savings shows that 96.12% of passengers are willing to shift to a good PT system. The willingness to pay an extra fare for good PT services is presented in **TABLE 2.60.** The results indicate that 28.94% of respondents prefer the fare to remain the same as the existing fare, while 48.03% are willing to pay up to Rs. 5 extra. Additionally, approximately 21.78% of passengers are willing to pay between Rs. 5 and Rs. 10 in addition to the existing fare.

TABLE 2.60: WILLINGNESS TO PAY EXTRA FARE

PASSENGER TRIPS	EXTRA AS COMPARED TO EXISTING MODE FARE (RS.)								TOTAL
	SAME FARE	0-2	2-5	5-10	10-15	15-20	20-25	25>	
TOTAL	28458	23784	23457	21421	904	96	110	119	**98350**
(%)	28.94	24.18	23.85	21.78	0.92	0.10	0.11	0.12	**100.00**

*Source: RITES Primary Survey 2025

2.13. PARKING SURVEYS

Parking surveys were conducted at 27 locations as shown in **Figure 2.28** along identified on-street & off-street parking stretches on major arterial and sub-arterial roads in the study area. The surveys were carried out over a 12-hour period (from 8 a.m. to 8 p.m.) on a fair-weather working day. The findings from the parking survey revealed that off-street parking facilities are very limited in the study area, and majorly on-street parking is observed. The characteristics of parking, as per the survey, are presented in the subsequent paragraphs.

i. Parking Accumulation

The observed peak parking accumulation at the surveyed locations is presented in **TABLE 2.61**. The highest peak parking accumulation is observed at Chandpole bazar, with 363 E.C.S., followed by Tripolia bazae, which has a peak accumulation of 348 E.C.S.

TABLE 2.61: PEAK HOUR PARKING ACCUMULATION

SN	NAME OF LOCATION	TIME	PEAK ACCUMULATION			EQUIVALENT CAR SPACES (ECS)	PARKING TYPE
			CAR	2-W	AUTO		
1	Tonk Road	1600-1630	208	85	19	248	On Street
2	Hospital Road	1200-1230	116	131	35	184	On Street
3	Johari Bazar Road	1630-1700	142	263	57	265	On Street
4	Moti Dongri Road	1230-1300	154	339	60	299	On Street
5	Agra Road	1330-1400	62	314	31	172	On Street
6	ACP tour to Jaipur Junction	1600-1700	21	19	11	37	On Street
7	ACP Tour to Police Station	2300-0000	20	15	13	37	On Street
8	Hotel Diamond to Chandpole	1700-1800	15	14	8	27	On Street
9	Mirza Ismail Road	1800-1900	16	14	6	26	On Street
10	Motilal Atal Road	1100-1200	11	7	14	27	On Street
11	Parivahan Road	1400-1500	18	24	25	49	On Street
12	Vansthali Road	1600-1700	12	9	0	14	On Street
13	Transport Nagar Left Side	1100-1200	12	0	6	18	On Street
14	Transport Nagar Right Side	1200-1300	11	5	6	18	On Street
15	Near Kalpana Travels	0900-1000	13	9	0	15	Off Street
16	Near Royal Trading Company	0900-1000	0	48	0	12	Off Street
17	High Court (Bhagwan Das Road)	1330-1400	128	26	2	137	On Street
18	Gandhi Nagar Railway Station Parking	0900-0930	6	367	1	99	On Street
19	Jaipur Railway Station Parking-Gate No-01	0900-0930	62	234	0	121	Off Street
20	Jaipur Railway Station Parking-Gate No-02	2030-2100	43	241	0	103	Off Street
21	City Palace Parking	2030-2100	29	61	0	44	Off Street
22	Chandpole Metro Station Parking	2030-2100	5	24	1	12	Off Street

SN	NAME OF LOCATION	TIME	PEAK ACCUMULATION			EQUIVALENT CAR SPACES (ECS)	PARKING TYPE
			CAR	2-W	AUTO		
23	Barkat Nagar Market	1930-2000	24	898	0	249	On Street
24	Bapu Bazaar Road	1630-1700	117	744	4	307	On Street
25	Chandpole Bazaar Road	1730-1800	143	854	6	363	On Street
26	Tripolia Bazaar Road	1730-1800	132	847	4	348	On Street
27	JDA Vaishali Marg Parking	1830-1900	5	0	0	5	Off Street
Grand Total			**1525**	**5592**	**309**	**3232**	

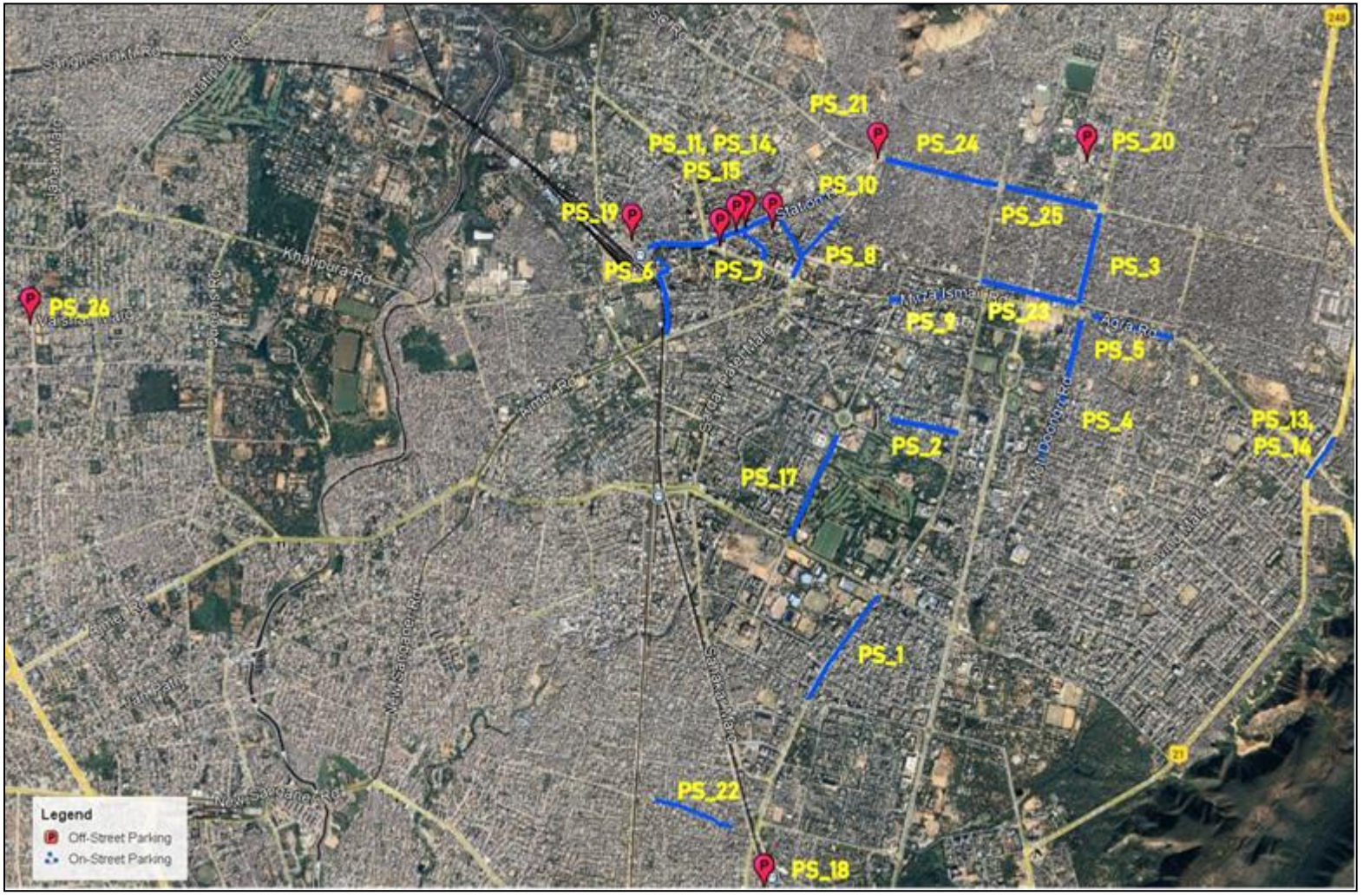
*Source: RITES Primary Survey 2025

ii. Parking Duration

Parking duration is an important indicator for analyzing the temporal characteristics of parking in the study area. Vehicles parked for up to two hours are categorized as short-duration parking, while those parked for more than eight hours are considered long-duration parking. Vehicles parked between 2 to 8 hours are classified as medium-term parking. *(Detailed mode wise distribution is attached at **Annexure 2.5** for reference).*

All the surveyed locations primarily feature short-term parking, with a negligible share of long-term parking. The highest share of long-term parking (3.20%) is observed along Tonk Road.

FIGURE 2.28: PARKING SURVEY LOCATIONS



2.14. PUBLIC TRANSPORT/ INTERMEDIATE PUBLIC TRANSPORT SURVEY

The PT/IPT survey was conducted to assess the characteristics of public transport (PT) and intermediate public transport (IPT) users at various stops as shown in **Figure 2.29** in the study area. The survey has been conducted at a total of 40 PT/IPT stops. The services provided by shared autos, public and private buses, e-rickshaws, etc., contribute to the public transport system in the city, and surveys were conducted at these stops. **TABLE 2.66** presents the distribution of passengers at PT/IPT stops. It is observed that the IPT stop at Sindhi Camp caters to the highest number of passengers, with 4,645 boarding and 4,716 alighting passengers daily followed by Jaipur station with total daily boarding alighting passengers of 7813.

i. Origin – Destination Survey at PT/IPT Stops

Passengers at PT/IPT stops were interviewed to gather data on their origin-destination (OD) and other travel characteristics. The survey revealed that the majority of trips are performed for work (34.6%) and business (30.6%) purposes. Educational trips account for 7.9%, while social trips contribute to 11.6%. The distribution of passenger trips by purpose is presented in **TABLE 2.62.**

TABLE 2.62: DISTRIBUTION OF PT/IPT PASSENGERS BY TRIP PURPOSE

PASS. TRIPS	WORK	BUSINESS	EDUCATION	SOCIAL	OTHER	TOTAL
TRIPS	35473	31465	8160	11932	15634	102664
COMPOSITION	34.6%	30.6%	7.9%	11.6%	15.2%	100.0%

*Source: RITES Primary Survey 2025

The distribution of passengers by travel frequency is presented in **TABLE 2.63.** It is observed that approximately 56.3% of the total passengers travel daily, while 16.4% travel weekly, 13.4% travel monthly, and 13.8% travel occasionally.

TABLE 2.63: DISTRIBUTION OF PT/IPT PASSENGERS BY TRAVEL FREQUENCY

PASS. TRIPS	DAILY	WEEKLY	MONTHLY	OCCASIONALLY	TOTAL
TRIPS	57774	16887	13797	14206	102664
COMPOSITION	56.3%	16.4%	13.4%	13.8%	100.0%

*Source: RITES Primary Survey 2025

The distribution of passengers by travel time (**TABLE 2.64**) indicates that 54.5% of passengers have a travel time of more than 60 minutes, while 30.8% have travel times ranging between 30 and 60 minutes. About 13.4% of passengers have a travel time between 10 and 30 minutes, and only 1.3% of passengers travel for less than 10 minutes.

TABLE 2.64: DISTRIBUTION OF PT/IPT PASSENGERS BY TRAVEL TIME

PASS. TRIPS	0-10 MIN	10-20 MIN	20-30 MIN	30-45 MIN	45-60 MIN	>60 MIN	TOTAL
TRIPS	1289	4647	9152	17401	14220	55954	102664
COMPOSITION	1.3%	4.5%	8.9%	16.9%	13.9%	54.5%	100.0%

*Source: RITES Primary Survey 2025

The distribution of passengers by journey distance is presented in (**TABLE 2.65).** It is observed that the majority of trips, 51.3%, have a trip length ranging from 10 to 20 km. Approximately 17.8% of trips have a trip length between 5 to 10 km, while 23.9% of passengers have a journey distance ranging from 20 to 30 km. The details of daily and peak hour boarding & alighting passengers at surveyed PT/IPT stops are presented in **TABLE 2.66**.

TABLE 2.65: DISTRIBUTION OF PT/IPT PASSENGERS BY JOURNEY DISTANCE

PASS. TRIPS	0-2 KM	2-5 KM	5-10 KM	10-20 KM	20-30 KM	>30 KM	TOTAL
TRIPS	894	4701	18284	52634	24507	1645	102664
COMPOSITION	0.9%	4.6%	17.8%	51.3%	23.9%	1.6%	100.0%

*Source: RITES Primary Survey 2025

FIGURE 2.29: IPT SURVEY LOCATIONS



TABLE 2.66: DISTRIBUTION OF PASSENGERS AT PT/IPT STOPS

S. NO	NAME OF STAND	TOTAL BOARDING (B)	TOTAL ALIGHTING (A)	TOTAL B+A	PEAK TIME	PEAK HOUR BOARDING	PEAK HOUR ALIGHTING	PEAK HOUR B+A
1	Badi Chaupar to Galta Gate	1899	2056	3955	1815 – 1915	153	162	315
2	Badi Chaupar to Johari Bazar	2322	2028	4350	1715 – 1815	176	164	340
3	Ram Niwas Bagh_1	1975	1730	3705	0815 – 0915	171	136	307
4	Ram Niwas Bagh_2	1837	1549	3386	1715 – 1815	148	144	292
5	Narayan Singh Circle	2671	2369	5040	1715 – 1815	196	199	395
6	Narayan Singh Circle Opposite	1833	2542	4375	1900 – 2000	137	212	349
7	Gandhi Nagar Railway Station	1123	1343	2466	1100 – 1200	86	108	194
8	20ft Intesection (Towards Jaipur)	2772	2478	5250	1900 – 2000	221	226	447
9	Kumbha Marg Chauraha Opposite	1470	1458	2928	1845 – 1945	116	116	232
10	Sikar Road	1808	1754	3562	1830 – 1930	150	141	291
11	Sikar Road Stop Opposite	2140	2054	4194	1900 – 2000	174	176	350
12	Chomu Pulia_1	2456	2165	4621	0845 – 0945	202	193	395
13	Chomu Pulia_2	3781	3580	7361	1845 – 1945	299	306	605
14	Chandpole 2	3220	2897	6117	1830 – 1930	275	283	558
15	Sindhi Camp_1	4322	4506	8828	0845 – 0945	331	349	680
16	**Sindhi Camp_2**	4645	4716	**9361**	1830 – 1930	361	399	760
17	Jaipur Metro Station	3869	3792	7661	0930 – 1030	379	284	663
18	Jawahar Circle	2725	2753	5478	1700 – 1800	292	168	460
19	Jawahar Nagar Circle 2	1641	1612	3253	1130 – 1230	176	121	297
20	High Court Circle	1197	1242	2439	1845 – 1945	93	102	195
21	Chomu Bus Stand	549	438	987	19:00-20:00	43	30	73
22	Vidhyadhar Nagar_1	349	396	745	09:00-10:00	55	21	76
23	Vidhyadhar Nagar_2	256	294	550	08:00-09:00	34	25	59
24	Collectorate office Bus Stop_1	578	362	940	08:00-09:00	69	25	94
25	Collectorate office Bus Stop_2	649	510	1159	08:00-09:00	63	41	104

S. NO	NAME OF STAND	TOTAL BOARDING (B)	TOTAL ALIGHTING (A)	TOTAL B+A	PEAK TIME	PEAK HOUR BOARDING	PEAK HOUR ALIGHTING	PEAK HOUR B+A
26	Choti Chaupar_1	876	479	1355	10:00-11:00	90	28	118
27	Choti Chaupar_2	793	531	1324	09:00-10:00	63	51	114
28	Amer Bus Stop_1	258	197	455	13:00-14:00	19	24	43
29	Amer Bus Stop_2	297	220	517	09:00-10:00	25	25	50
30	KV No-3_1	327	261	588	08:00-09:00	44	28	72
31	KV No-3_2	304	210	514	10:00-11:00	20	31	51
32	Airport_1	82	42	124	07:00-08:00	4	7	11
33	Airport_2	62	48	110	07:00-08:00	6	6	12
34	Chartala Circle	318	275	593	08:00-09:00	29	35	64
35	Ram Nagar Metro Station	804	535	1339	10:00-11:00	59	52	111
36	Shankar Bhawan Bus Stop	250	194	444	11:00-12:00	21	21	42
37	Jaipur Junction	4001	3812	7813	19:00-20:00	299	304	603
38	Galta Road	730	465	1195	10:00-11:00	77	41	118
39	B2 Bypass Circle_1	194	135	329	12:00-13:00	19	12	31
40	B2 Bypass Circle_2	186	136	322	09:00-10:00	16	10	26

*Source: RITES Primary Survey 2025

2.15. OPERATOR & OPINION SURVEY

i. PT/IPT Operator Survey

The PT/IPT Operator survey was conducted to assess the operational characteristics of PT/IPTs such as fleet utilization, cost of operation, earnings per day etc. Survey shows that shared auto and E-rickshaw are the predominant modes used in Jaipur with the fleet size of operators ranging from 1-2 vehicles. **TABLE 2.67** gives salient information about the PT/IPT operational characteristics.

About 300 samples were obtained to assess the operational characteristics of buses and autos such as route length, average number of trips per day, cost of operation, earning per day etc. The major findings of the operator survey are:

TABLE 2.67: OPERATIONAL CHARACTERISTICS OF PT/IPT

OPERATIONAL CHARACTERISTICS	AUTO	BUS
Average route length (Km)	10.8	11.4
Average number of trips per day	10	8
Average no. of passengers carried per route per trip	3	30
Average earning per day per vehicle (Rs.)	940	6000
Fleet Size	1 to 2	1 to 2
Kilometers operated per day per vehicle	150	225
Minimum fare (Rs.)	10	20

*Source: RITES Primary Survey 2025

ii. NMT Operator and Opinion Survey

The NMT opinion survey was conducted at major transport activity nodes like railway stations, bus stands, metro stations etc. In the survey, operators of cycle rickshaw, and bicycle users were interviewed to obtain the operational characteristics of NMT along with the opinion of the users.

About 200 samples were obtained to assess the operational characteristics of NMT operators like Cycle Rickshaw and Cyclist. The major findings of the operator survey are given in **TABLE 2.68.**

TABLE 2.68: OPERATIONAL CHARACTERISTICS FOR NMT

CYCLIST		
S. NO.	OPERATIONAL CHARACTERISTICS	VALUE
1	Average trip length (km)	6
2	Average Travel Time (Min)	38

Source: RITES Primary Survey 2025

The opinion survey for NMT users revealed that about 49% of the users want separate NMT lane, 60% of the users want safe parking space/ stand for their NMT modes and 57% of the users are in favour of implementing public bicycle sharing scheme in the city.

2.16. FREIGHT TERMINAL SURVEY

The freight terminal survey data indicates that normal trucks (2–3 axle) dominate goods transport in the city, comprising 56.43% of the fleet, followed by light commercial vehicles (LCVs) at 27.14% and multi-axle trucks at 16.43%. As shown in **Table 2.69** in terms of load, the majority of freight lies within the 1–10 ton (35.71%) and 20–25 ton (31.43%) brackets, reflecting a mix of medium and heavy cargo movement.

Table 2.71 represents trip lengths and it is concurred that most freight trips are medium- to long-distance, with 33.57% covering 200–500 km, and 30% traveling 500–1000 km. A notable share (22.14%) falls in the 1000–1500 km range, indicating regional and inter-state freight movement. Correspondingly as per **Table 2.72**, trip times mostly range from 5 to 30 hours (covering 74.29% of all trips), aligning with the reported distances.

As per **Table 2.73**, weekly trips are most common (50.71%), followed by monthly operations (42.14%), suggesting periodic bulk movements rather than daily operations. Overall, the data reflects a freight pattern characterized by regular, medium-to-long haul trips using primarily normal trucks and moderate tonnage capacities.

TABLE 2.69: TYPE OF VEHICLES ARRIVING AT FREIGHT TERMINAL

TYPE OF VEHICLES	FREIGHT TRIPS (%)
LCV	27.14
Normal Truck (2-3 Axle)	56.43
Multi Axle	16.43
Total	100.00

*Source: RITES Primary Survey 2025

TABLE 2.70: LOADING CAPACITY OF VEHICLES AT FREIGHT TERMINAL

TONNAGE	FREIGHT TRIPS (%)
1-10	35.71
10-15	22.86
20-25	31.43
25-30	7.86
>30	2.14
Total	100.00

*Source: RITES Primary Survey 2025

TABLE 2.71: DISTANCE COVERED BY VEHICLES TO REACH FREIGHT TERMINAL

TRIP LENGTH (KM)	FREIGHT TRIPS (%)
100-200	2.14
200-500	33.57
500-1000	30.00
1000-1500	22.14
1500-2000	7.86
>2000	4.29
Total	**100.0**

*Source: RITES Primary Survey 2025

TABLE 2.72: TRIP DURATION FOR VEHICLES TO REACH FREIGHT TERMINAL

TRIP TIME (HRS.)	FREIGHT TRIPS (%)
1-5 hours	2.14
5-10 hours	32.86
10-20 hours	14.29
20-30 hours	27.14
30-50 hours	14.29
>50	9.29
Total	**100.0**

*Source: RITES Primary Survey 2025

TABLE 2.73: TRIP FREQUENCY OF VEHICLES

TRIP FREQUENCY	FREIGHT TRIPS (%)
Daily	1.43
Weekly	50.71
Monthly	42.14
Occasionally	5.71
Total	**100.00**

*Source: RITES Primary Survey 2025

2.17. TOURIST SURVEY

The tourist survey as per **Table 2.74** shows that most visitors (63.2%) stay for three days, indicating this as the ideal duration to explore the city in the locations shown in **Figure 2.30**. Four-day stays follow at 19.7%, while two-day visits account for 11.7%. Short stays of one day are less common (5.1%), and extended visits beyond four days are rare (0.2%). Overall, the typical tourist visits span 2 to 4 days.

The tourist survey data on the mode share of tourist travel within the city as represented in **Table 2.75** indicates a strong preference for hired vehicles, with taxis emerging as the most popular choice, accounting for 58.1% of tourist travel. This is followed by auto-rickshaws, used by 21.8% of tourists, highlighting their role as a convenient and accessible option for local mobility. Private vehicles are used by 12.5%,

reflecting a segment of tourists who either drive themselves or travel with local acquaintances. Metro services account for 5.7%, indicating a relatively low yet notable uptake of mass rapid transit among tourists. Public buses, with only 0.8% usage, appear to be the least preferred, likely due to issues related to comfort, accessibility, or lack of tourist-friendly information. Overall, the data suggests a clear reliance on personalized or flexible travel modes among tourists, with limited use of public transport systems.

Table 2.76 of survey reveals that most tourists (27.5%) spend ₹1000–2000 daily, followed by 17.5% spending ₹3000–5000 and 17.2% in the ₹2000–3000 range. 20.5% manage with less than ₹500, while higher spenders (over ₹5000) are few (3.1%). Overall, daily expenses are moderate for the majority.

Table 2.77 represents the opinion of tourists for the existing infrastructure facilities of the city and ease of accessibility to reach the tourist locations.

TABLE 2.74: TRIP DURATION OF TOURISTS

S. NO.	VISIT DURATION	TRIPS (%)
1	One day	5.1
2	Two days	11.7
3	Three days	63.2
4	Four days	19.7
5	More than four days	0.2
Total		**100.0**

Source: RITES Primary Survey 2025

TABLE 2.75: MODE SHARE OF TOURIST TRAVEL IN JAIPUR

S. NO.	MODE OF TRAVEL IN CITY	TRIPS (%)
1	Public Bus	0.8
2	Private Vehicle	12.5
3	Taxi	58.1
4	Metro	5.7
5	Auto	21.8
6	Others	1.0
Total		**100.0**

Source: RITES Primary Survey 2025

TABLE 2.76: DAILY EXPENDITURE ON TRAVEL BY TOURISTS

S. NO.	AVERAGE DAILY TRAVEL EXPENSES	TRIPS (%)
1	<500	20.5
2	500-1000	14.2
3	1000-200	27.5
4	2000-3000	17.2
5	3000-5000	17.5
6	>5000	3.1
Total		**100.0**

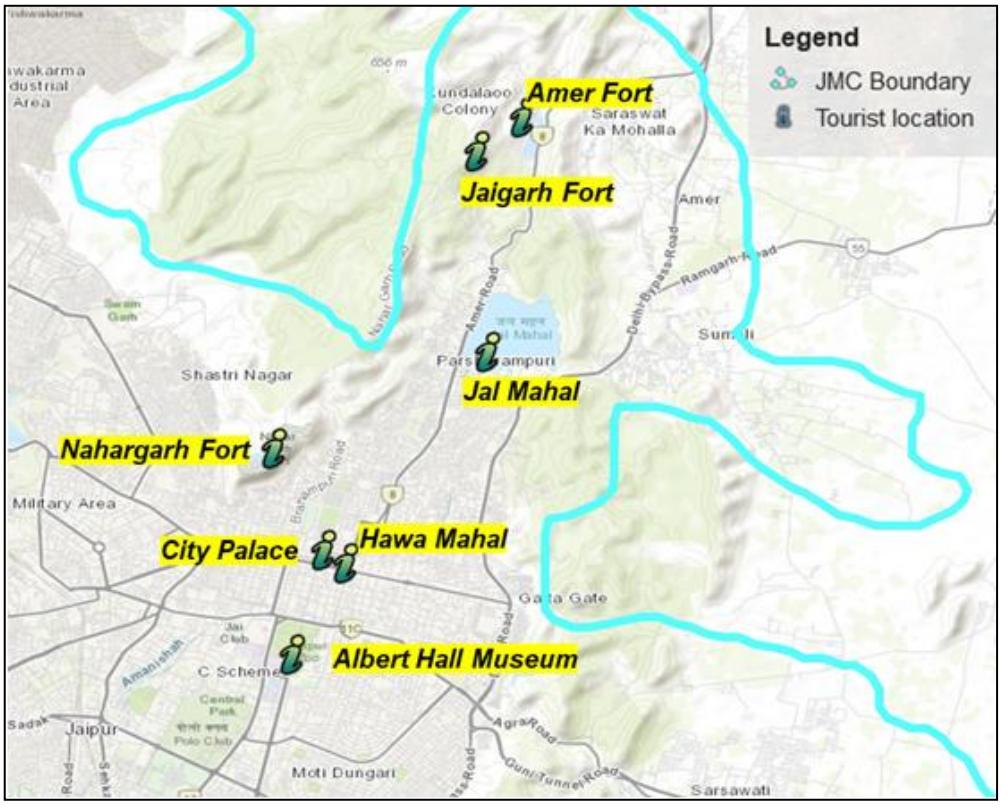
Source: RITES Primary Survey 2025

TABLE 2.77: OPINION ON EXISTING INFRASTRUCTURE FACILITIES AT TOURIST LOCATIONS

CRITERIA FOR RATING	RATING (%)			
	POOR	AVERAGE	GOOD	EXCELLENT
Walking	5.54	51.95	41.07	1.44
Parking	3.70	50.10	43.12	3.08
Safety	8.21	36.55	52.36	2.87
Public Conveyance	6.98	46.82	42.71	3.49
Pollution	32.03	28.34	37.58	2.05
Congestion	30.39	27.52	38.40	3.70
Cleanliness	5.54	52.36	36.76	5.34
Transport Availability	3.29	37.37	50.72	8.62

Source: RITES Primary Survey 2025

FIGURE 2.30: TOURIST SURVEY LOCATIONS



2.18. SOCIO-ECONOMIC CHARACTERISTICS

The household travel survey was conducted to establish the relationship between socio-economic factors and the travel characteristics of residents within the study area. The survey examined various parameters, including household size, income, vehicle ownership, per capita trip rates for different purposes, transport expenditure, modal split, and origin-destination patterns. To ensure the sample's representativeness, households were selected from each zone in proportion to the zone's population within the study area.

In total, 11,000 households across 190 internal traffic zones were interviewed. A random sampling technique was employed for sample selection, ensuring representation of all socio-economic strata—namely, High-Income Groups (HIG), Middle-Income Groups (MIG), and Lower-Income Groups (LIG). Enumerators received training to conduct the survey effectively. The process began with a pilot survey to test the methodology, and adjustments to the observation recording methods were made as needed before initiating the main survey.

The collected data underwent error checking, after which it was compiled and coded. The coded information was subsequently entered and analyzed using computer software.

2.18.1. Household Socio-Economic Characteristics

i. Household Size

The average household size in the study area is 3.65 individuals per household. **TABLE 2.78** presents the distribution of households by size. Notably, 77.5% of the households fall under the category of 3-4 individuals per household, while only 2.7% of households consist of more than 6 individuals.

TABLE 2.78: DISTRIBUTION OF HOUSEHOLDS BY SIZE

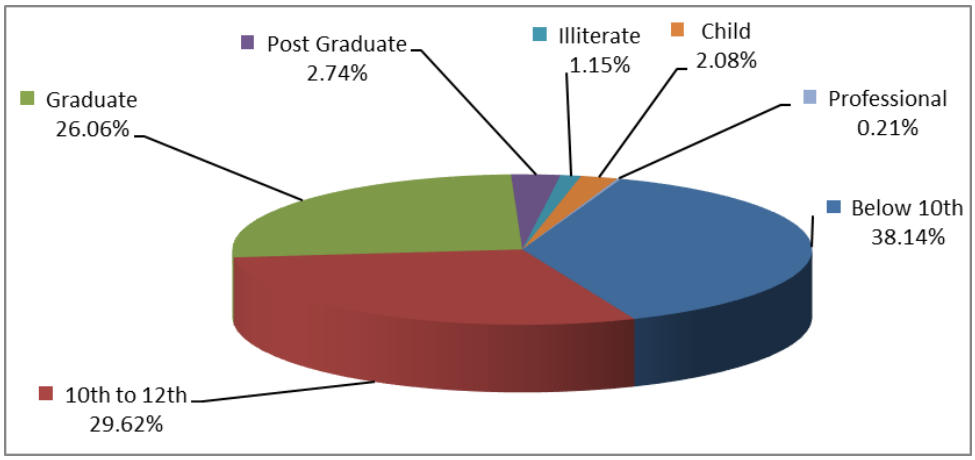
S. NO.	HOUSEHOLD BY SIZE	PERCENTAGE
1	upto 2	7.9%
2	3	37.8%
3	4	39.7%
4	5	12.0%
5	6	2.0%
6	7	0.5%
7	8 or more	0.2%
Total		**100%**

*Source: RITES Primary Survey 2025

ii. Education Level

The distribution of individuals by educational qualifications is presented in **FIGURE 2.31**. In each household, individuals below the age of four are categorized as children, comprising 2.08% of the surveyed sample. Approximately 67.76% of individuals have an education level below the 12th standard. Graduates and postgraduates collectively represent nearly 28.80% of the surveyed sample, while 1.15% of the sample is classified as illiterate.

FIGURE 2.31: DISTRIBUTION OF POPULATION BY QUALIFICATION

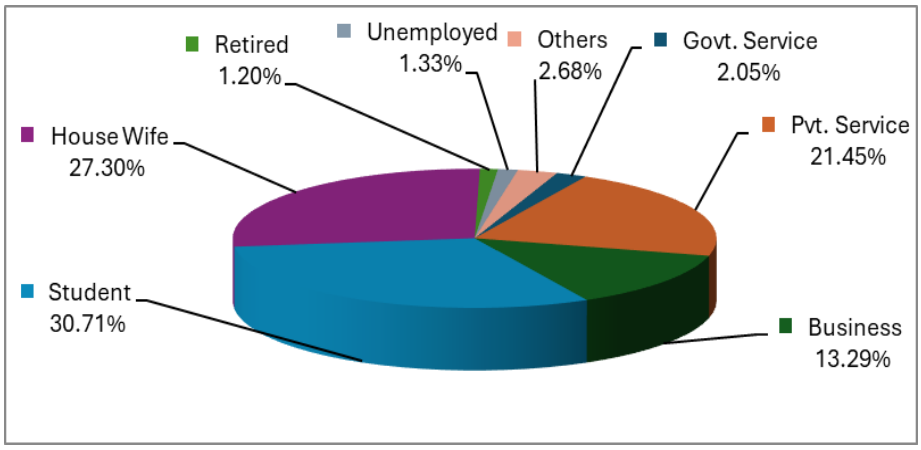


*Source: RITES Primary Survey 2025

iii. Occupation

The occupational structure of the surveyed household members is illustrated in **FIGURE 2.32**. Approximately 36.79% of individuals are engaged in occupations such as government service, private sector jobs, and business activities. On the other hand, 60.54% of the sample consists of non-workers, including students, homemakers, retired individuals, and unemployed people.

FIGURE 2.32: DISTRIBUTION OF INDIVIDUALS BY OCCUPATION



*Source: RITES Primary Survey 2025

iv. Monthly Household Income and Expenditure on Transport

The average monthly household income in the study area is Rs. 29,770. **TABLE 2.79** presents the distribution of Households by monthly income. It is observed that majority of people fall within the income group of Rs 25,000 to Rs 50,000 (41.7%), followed by Rs 15,000 to Rs 20,000 (21.4%) and Rs 20,000 to Rs 25,000 (18.7%). Only a small proportion (around 1.2%) earn below Rs 10,000 (0.5% and 0.7% in the <Rs 5000 and Rs 5000 - Rs 10000 categories). A smaller portion of people earn above Rs 50,000 (10.7%), with the remaining income groups capturing a middle-range portion of the population.

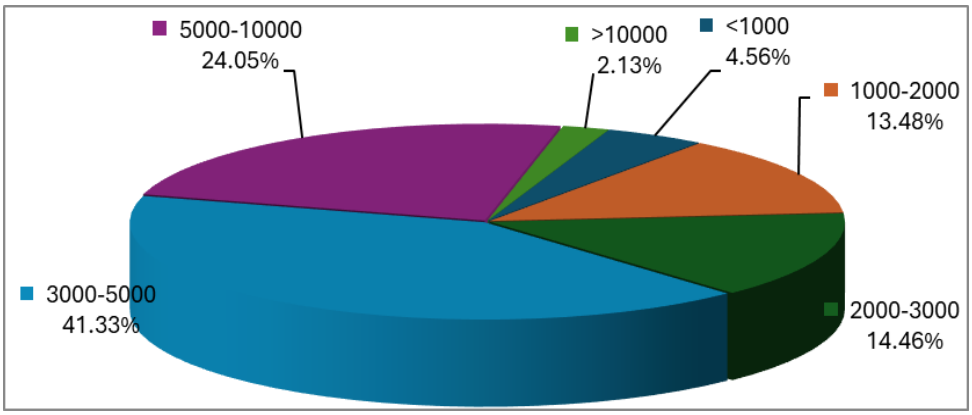
As presented in **FIGURE 2.33** majority of the households (41.33%) spends Rs. 3000 – Rs. 5000 on transportation needs followed by 24.05% households spending Rs. 5000 – Rs. 10000.

TABLE 2.79: DISTRIBUTION OF HOUSEHOLDS BY MONTHLY INCOME

S. NO	INCOME GROUP	PERCENTAGE
1	<Rs 5000	0.5%
2	Rs 5000 - Rs 10000	0.7%
3	Rs 10000 - Rs 15000	6.3%
4	Rs 15000 - 20000	21.4%
5	Rs 20000-25000	18.7%
6	Rs 25000-50000	41.7%
7	>50000	10.7%
8	No Response	0.0%

*Source: RITES Primary Survey 2025

FIGURE 2.33: DISTRIBUTION OF HOUSEHOLDS BY SHARE OF TRANSPORT EXPENDITURE



*Source: RITES Primary Survey 2025

v. Vehicle ownership

TABLE 2.80 represents vehicle ownership details in households in the study area. The majority of households (71.6%) own only one two-wheeler, and most households own at

least one. This reflects the high popularity and affordability of two-wheelers, likely used for daily commutes in many regions. Over 60% of households do not own a car, indicating that car ownership is not as common. However, among those who own cars, a large majority (36.2%) own only one car. Both two-wheeler and car ownership show a very small percentage of households owning multiple vehicles. Only 19.4% of households own two two-wheelers, and even fewer (3.2%) own two cars. The percentage of people owning more than two vehicles (either two-wheelers or cars) is extremely low.

TABLE 2.80: DISTRIBUTION OF OWNERSHIP OF VEHICLES IN HOUSEHOLDS

DESCRIPTION	NIL	1	2	3 AND MORE
% of HH owning Two Wheelers	8.5%	71.6%	19.4%	0.5%
% of HH owning Cars	60.6%	36.2%	3.2%	0.1%

*Source: RITES Primary Survey 2025

2.18.2. Travel Characteristics

i. Per Capita Trip Rate

The total daily trips in the study area, as derived from the household survey, amount to approximately 83.51 lakh. The distribution of daily trips by mode is presented in **TABLE 2.81.** About 79.8% of these trips are vehicular, while 20.2% are walk trips. This highlights the importance of prioritizing pedestrian infrastructure in urban mobility planning. The per capita trip rate (PCTR) is 1.50 when walk trips are included and 1.19 when they are excluded.

It is observed that the majority of vehicular trips (45.5%) are undertaken using two-wheelers, cars, vans, or jeeps. Auto-rickshaws and buses account for 27.4% of the trips. The low usage of public transport suggests potential areas for development and investment in infrastructure. Furthermore, the decline in PCTR from 1.50 (including walking) to 1.19 (excluding walking) underscores that walking constitutes a significant share of total trips per household, reducing the dominance of motorized travel.

TABLE 2.81: DISTRIBUTION OF DAILY PASSENGER TRIPS BY MODE

TRIP TYPE	TYPE OF VEHICLE	NUMBER OF TRIPS	PERCENTAGE
Vehicular Trips	Car, Van, Jeep	953760	11.4%
	Two Wheelers	2846022	34.1%
	Auto	1369614	16.4%
	Bus	914863	11.0%
	School Bus	312897	3.7%
	Chartered Bus	28859	0.3%
	Cycle	170654	2.0%
	Cycle Rickshaw	2434	0.03%
	Metro/Train	55652	0.7%
	E-Rickshaw	12705	0.2%
Walk Trips	Walk	1684101	20.2%
Total Trips		**8351561**	**100.0%**
PCTR including walk		**1.50**	
Total Trip without walk		**6667460**	
PCTR Excluding walk		**1.19**	
Total Motorized Trip		**6481667**	
PCTR Motorized		**1.16**	

*Source: RITES Primary Survey 2025

ii. Trip Purpose

The distribution of daily trips by purpose is presented in **TABLE 2.82.** Work-related trips account for 29.59% of total trips, making it the largest category, with most of these trips being vehicle-based, as is typical for daily commuting patterns. Business-related trips represent 16.99% of the total, showcasing a notable balance between vehicle and walking trips, though vehicles remain the dominant mode.

Education-related trips comprise approximately 31.96% of the total, highlighting a significant share of trips associated with schooling and academic activities. Social and other purposes account for 21.47% of the total trips, reflecting the remaining share of daily travel activities.

TABLE 2.82: DISTRIBUTION OF VEHICULAR & WALK TRIPS BY PURPOSE

S. NO.	TRIP PURPOSE	VEHICLE TRIPS		WALK TRIPS		TOTAL TRIPS BY PURPOSE	% OF TOTAL
		TRIPS	%	TRIPS	%		
1	Work	2420304	36.3%	51182	3.0%	2471487	29.59%
2	Business	1298835	19.5%	119713	7.1%	1418547	16.99%
3	Education	1702142	25.5%	966639	57.4%	2668781	31.96%
4	Others	1246181	18.7%	546567	32.5%	1792748	21.47%
Total Trips by Mode		66,67,461	100.0%	16,84,101.47	100.0%	83,51,563	100.00%

*Source: RITES Primary Survey 2025

iii. Trip Length

Mode-wise trip length details are presented in **TABLE 2.83.** The data reveals that walking trips cover an average distance of 1.62 km, reflecting the substantial share of local, short-distance trips undertaken on foot. Cars and two-wheelers have average trip lengths of 10.7 km and 8.14 km, respectively, while cycles, cycle rickshaws & e-rickshaws cover average distances of 2.41 km, 4.36 km and 6.46 km respectively. Buses record a higher average trip length of 7.14 km, followed by shared autos at 5.33 km. Train and chartered bus record average trip length of 67.80 km and 19.14 km respectively.

TABLE 2.83: DISTRIBUTION OF TRIP LENGTH BY MODE

S.NO	TYPE OF VEHICLE	TRIP LENGTH (KM)												TOTAL TRIPS	AVG. TRIP LENGTH (KM)
		Upto 3	3-5	5-7	7-10	10-13	13-15	15-18	18-20	20-25	25-30	30-35	>35		
1	Car, Van, Jeep	81802	125351	156640	289014	102442	71492	32156	32025	21707	28897	5686	3816	951028	10.07
2	Two Wheelers	498822	477597	558927	691357	239212	147092	55206	69849	39374	32839	2950	11146	2824371	8.14
3	Auto	519064	408164	174379	192441	21923	22584	7382	5690	7847	3245	2843	2055	1367617	5.33
4	Bus	161822	201746	231818	195292	45778	34921	13765	13585	7217	4001	75	1374	911394	7.14
5	School Bus	110429	93938	29396	26722	3641	5008	1052	26954	4431	8736	0	595	310902	7.03
6	Chartered Bus	1521	2777	4209	3912	386	1408	0	0	0	13058	460	1129	28860	19.14
7	Cycle	142482	27994	178	0	0	0	0	0	0	0	0	0	170654	2.41
8	Cycle Rickshaw	1479	572	0	0	0	384	0	0	0	0	0	0	2435	4.36
9	Metro/Train	1159	5088	6368	15772	5523	1413	1023	799	618	14574	0	3315	55652	67.80
10	Walk	1605422	4184	3277	5006	3568	31938	0	751	424	2943	0	14604	1672117	1.62
11	E-Rickshaw	4568	4176	2836	460	0	0	0	0	0	425	0	240	12705	6.46

*Source: RITES Primary Survey 2025

TABLE 2.84: OVERALL DISTRIBUTION OF PASSENGER TRIPS BY TRIP LENGTH

DESCRIPTION	TRIP LENGTH (IN KMS)												TOTAL TRIPS	AVG. TRIP LENGTH (KM)
	Upto 3	3-5	5-7	7-10	10-13	13-15	15-18	18-20	20-25	25-30	30-35	>35		
Total Trips	3128570	1351586	1168029	1419976	422473	316241	110584	149654	81618	108718	12014	38274	8307737	13.50
Percentage	37.66%	16.27%	14.06%	17.09%	5.09%	3.81%	1.33%	1.80%	0.98%	1.31%	0.14%	0.46%	100.00%	

iv. Travel Time

The distribution of trips by travel time is presented in **TABLE 2.85.** It is observed that the majority of trips (67.08%) are completed within a travel time of 10 to 30 minutes. About 16.35% of trips are completed in less than 10 minutes, while 3% of trips take more than 30 minutes. This indicates a preference for quick, nearby destinations and shorter travel times within a reasonable commuting distance. Notably, only 1.07% of trips have a duration exceeding 60 minutes.

TABLE 2.85: OVERALL DISTRIBUTION OF PASSENGER TRIPS BY TRAVEL TIME

S. NO.	PARTICULARS	TRAVEL TIME (MINUTES)									TOTAL TRIPS
		Upto 10	11-20	21-30	31-45	46-60	61-75	76-90	91-120	>=121	
1	No. of Trips	1365296	2858513	2743227	754559	537722	27074	23572	22934	18666	83,51,563
2	Percentage	16.35%	34.23%	32.85%	9.03%	6.44%	0.32%	0.28%	0.27%	0.22%	100.00%

*Source: RITES Primary Survey 2025

v. Travel Cost

The distribution of passenger trips by travel cost in the study area is presented in **TABLE 2.86.** The two cost categories with the highest percentages of trips are Rs. 16-20 (21.22%) and Rs. 6-10 (19.86%). Together, the cost categories ranging from Rs. 6-30 constitute a significant portion of all trips, indicating that most trips are associated with mid-range costs.

Trips with costs between Rs. 46-70 and Rs. 71-100 account for 15.28% and 10.76% of the total trips, respectively. This reflects a notable share of trips with higher costs, potentially representing longer travel distances or the use of more expensive transport modes, such as cabs or premium public transit options. Additionally, trips costing Rs. 101 or more represent 6.95% of the total, demonstrating that, while not a majority, a significant number of trips incur expenses above Rs. 100. The low-cost trips (up to Rs. 5) and very high-cost trips (above Rs. 100) are less frequent.

TABLE 2.86: DISTRIBUTION OF PASSENGER TRIPS BY TRAVEL COST

S. NO.	PARTICULARS	TRAVEL COST (RS.)									
		UPTO 5	6-10	11-15	16-20	21-30	31-45	46-70	71-100	>=101	TOTAL TRIPS
1	Percentage	3.31%	19.86%	5.60%	21.22%	12.46%	4.56%	15.28%	10.76%	6.95%	100.00%

*Source: RITES Primary Survey 2025

vi. Willingness to shift to Good PT System

The household survey conducted reveals that 99.40% of individuals are willing to shift to a good PT system to save on travel time. The willingness to pay an extra fare for good PT services is presented in (**TABLE 2.87**).

TABLE 2.87: WILLINGNESS TO SHIFT TO GOOD PT SYSTEM WRT INCREASE IN EXISTING FARE

S. NO.	INCREASE IN EXISTING FARE	PERCENTAGE
1	Same as Existing Fare	97.7%
2	1.25 Times of Existing Fare	2.3%

*Source: RITES Primary Survey 2025

2.19. FUTURE LAND USE DEVELOPMENT PLAN

The map showing land use distribution as per Master Plan 2025 is presented in **FIGURE 2.34**. The land use in U1 urban area region is primarily agricultural (38.5%) followed by residential area (23.9%) both of which are spread all over the study area. Forest area covers about 9.3% and open spaces cover about 16.65%. Circulation accounts for 1.5% only. Commercial activities (2.5%) are mainly concentrated in Walled City and along MI road. Industrial area (2.7%) is not concentrated in any particular point and is observed in the north and south of the city.

FIGURE 2.34: LAND USE PLAN – MASTER PLAN 2025



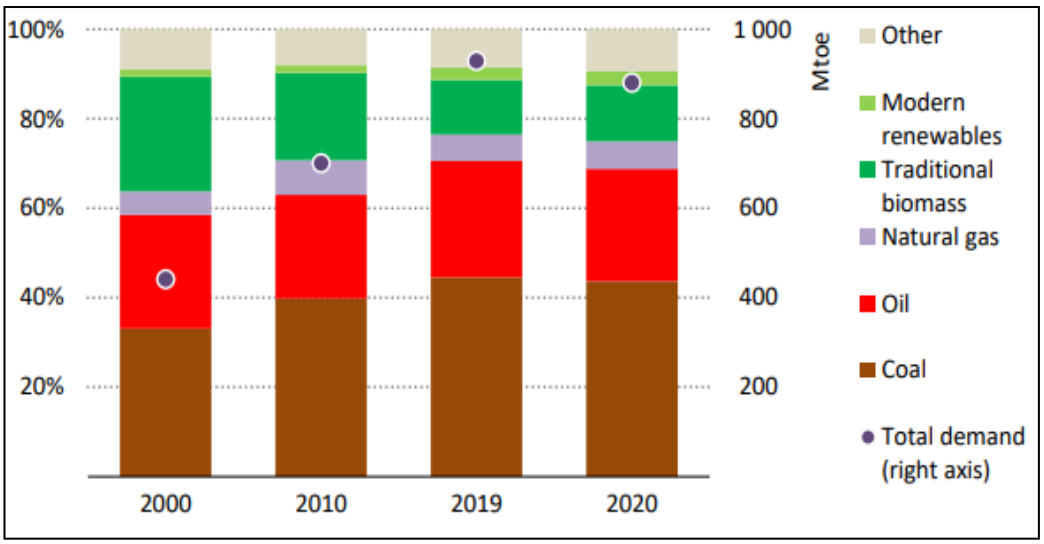
**Source: Master Development Plan 2025 for Jaipur Region*

2.20. REVIEW OF ENERGY AND ENVIRONMENT

2.20.1. Primary Energy Demand

India's energy demand has witnessed a significant transformation over the past three decades, with total primary energy consumption reaching approximately 39.02 Mtoe in 2023, making the country the third-largest energy consumer globally. The share of coal remains dominant at 56.3%, followed by oil (27.1%), while renewables have gradually risen to 6.1%. India's commitment to energy transition is evident in the 30 GW of clean energy capacity added in 2024, contributing to renewables generating 24% of electricity. However, coal still powers 75% of India's electricity, and the government plans to add 60 GW more coal-based capacity by 2030 to meet rising demand, especially in industrial and urban sectors. India's energy demand has tripled over the last three decades: the share of traditional biomass has fallen, leaving coal and oil dominant can be seen from **FIGURE 2.35**.

FIGURE 2.35: TOTAL PRIMARY ENERGY DEMAND IN INDIA



Source: India Energy Outlook 2021

Sector-wise, industry (42%) and transport (17%) lead in final energy consumption, with urbanization and freight logistics acting as key drivers. The transport sector remains the fastest-growing energy consumer, resulting in traffic congestion and air quality issues in urban centers. Although electrification and regulatory measures are progressing, oil demand is expected to keep growing significantly without stronger policy intervention.

Jaipur is experiencing a significant surge in energy consumption, driven by rapid urbanization, industrial expansion, and a growing population. The city's energy demand is increasing at an estimated rate of 8–10% annually, aligning with the broader state trends.

Despite Rajasthan's substantial investments in renewable energy, Jaipur continues to face challenges in meeting its energy requirements. The state's power distribution companies (DISCOMs) have reported a surplus in electricity availability; however, actual data indicates a heavy reliance on short-term power purchases. In the fiscal year 2023-24, Rajasthan procured a net 2,800 million units (MU) from short-term sources, and from September 2024 to March 2025 alone, it procured over 6,000 MU.

Rajasthan has set ambitious targets to enhance its renewable energy capacity, aiming for 90 GW of solar and wind power by 2030. The state plans to increase the share of solar energy in its electricity consumption from the current 12–14% to over 40% by 2030. Jaipur, with its high solar irradiance and vast rooftop spaces, is poised to play a pivotal role in achieving these targets.

The government has initiated programs like the PM Suryaghar Yojana, aiming to install subsidized rooftop solar systems in 500,000 households across Rajasthan, including Jaipur. Additionally, the state's Integrated Clean Energy Policy 2024 outlines plans to develop 90,000 MW of solar power, 25,000 MW of wind and hybrid energy, and 10,000 MW of hydro, pumped storage, and battery energy storage systems by 2030.

However, recent changes to land registration laws in Rajasthan are expected to increase the costs and delay renewable energy projects. Companies must now pay stamp duty for registering agreements for land sales or leases, resulting in at least an 8–10% rise in land expenses, which account for nearly 20% of overall project costs.

2.20.2. Emissions in Base Year

Air pollution levels are determined by the existing Ambient Air Quality Index (AQI). The AQI considers pollutants like PM_{10}, $PM_{2.5}$, NO_2, SO_2, CO, O_3, NH_3 among others. There are six AQI categories namely Good, Satisfactory, Moderate, Poor, Very Poor, and Severe. The AQI ranges, corresponding categories and possible health impacts are provided in **Figure 2.36**.

FIGURE 2.36: AIR QUALITY INDEX PARAMETERS

AQI	Remark	Color Code	Possible Health Impacts
0-50	Good		Minimal impact
51-100	Satisfactory		Minor breathing discomfort to sensitive people
101-200	Moderate		Breathing discomfort to the people with lungs, asthma and heart diseases
201-300	Poor		Breathing discomfort to most people on prolonged exposure
301-400	Very Poor		Respiratory illness on prolonged exposure
401-500	Severe		Affects healthy people and seriously impacts those with existing diseases

The ambient air quality data for January to November 2024 is presented in **Table 2.88** for Jaipur city. The observed air quality data reveals that the air quality of city varies between 'Satisfactory' and 'Poor' category.

FIGURE 2.37: AIR QUALITY MONITORING STATIONS

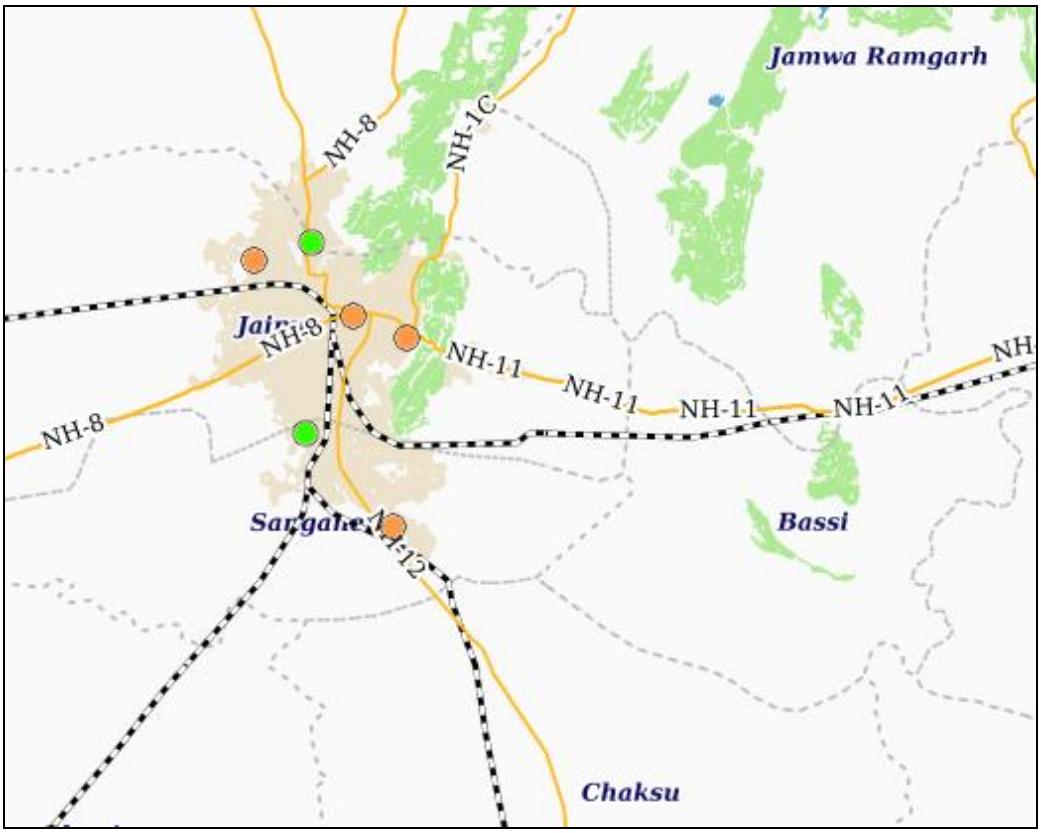


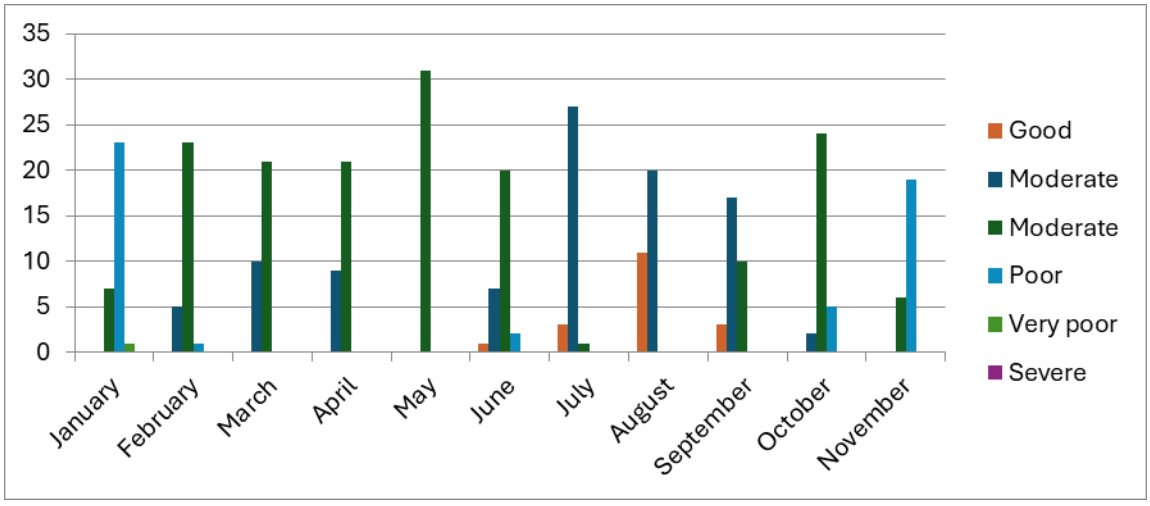
TABLE 2.88: MONTH WISE AMBIENT AIR QUALITY DATA

Date	January	February	March	April	May	June	July	August	September	October	November
1	252	196	114	107	186	129	62	45	60	126	252
2	257	181	62	116	127	108	71	52	73	112	248
3	278	155	86	116	145	101	70	47	68	100	201
4	288	188	95	119	151	142	50	67	66	110	223
5	271	82	110	154	135	128	54	37	60	98	260
6	278	110	101	98	161	143	61	44	51	111	280
7	287	120	122	101	164	294	101	59	49	133	256
8	292	138	126	96	158	278	65	61	45	131	229
9	303	149	94	116	140	146	53	64	62	132	218
10	232	156	98	118	130	150	94	57	100	132	204
11	258	176	109	99	195	127	78	52	60	110	237
12	230	231	118	106	134	123	65	45	64	117	188
13	224	175	104	91	121	144	58	46	100	111	158
14	222	200	109	131	121	112	82	50	107	126	169
15	205	170	95	99	124	117	90	48	101	113	153

Date	January	February	March	April	May	June	July	August	September	October	November
16	214	192	93	96	156	114	59	49	115	130	188
17	206	169	105	123	166	117	56	61	111	161	179
18	224	176	107	117	158	113	62	81	110	140	210
19	179	118	112	128	150	102	62	65	49	178	220
20	196	130	96	167	178	92	54	73	117	161	246
21	258	153	124	99	142	84	67	61	81	122	274
22	172	154	116	87	128	132	71	65	135	128	210
23	226	99	152	90	137	122	64	84	143	162	237
24	183	99	127	116	129	102	62	64	160	202	205
25	240	100	97	121	151	88	86	66	132	186	216
26	214	103	98	120	156	78	52	51	81	203	
27	195	106	124	162	185	48	77	43	61	213	
28	170	100	118	192	173	53	56	47	62	210	
29	182	114	111	173	176	58	50	56	76	161	
30	218		130	189	151	56	67	51	98	198	
31	233		108		140		49	54		238	

Source: Central Pollution Control Board

FIGURE 2.38: AMBIENT AIR QUALITY DATA ANALYSIS



2.20.3. Fuel Station Survey

A fuel station survey has been carried out to find out about the fuel efficiency and fuel mix in the city. Fuel efficiency from the survey and fuel mix data from survey and RTO for the base year are given in **TABLE 2.89, TABLE 2.90** and **Table 2.91.**

TABLE 2.89 FUEL EFFICIENCY OF SAMPLED VEHICLES

S. NO.	TYPE OF VEHICLE	TYPE OF FUEL	FUEL EFFICIENCY IN KM/LITER
1	Car	Petrol	14.80
		Diesel	15.24
		CNG	18.85
2	2 – Wheeler	Petrol	48.84
		CNG	100
3	3 – Wheeler	CNG	32.16
4	SUV	Diesel	10.19

* Source: RITES Primary Survey, 2025

TABLE 2.90: FUEL MIX OF SAMPLED VEHICLES

S. NO.	TYPE OF FUEL	FUEL MIX SHARE (%)
Two-wheeler		
1	Petrol	99.64%
2	CNG	0.05%
3	Electricity	0.32%
Total		**100%**
Three-wheeler		
1	CNG	62.7%
2	Electricity	37.3%
Total		**100%**
Car		
1	Petrol	58.66%
2	Diesel	31.61%
3	CNG	8.21%
4	Electricity	1.52%
Total		**100%**
SUV		
1	Petrol	50.79%
2	Diesel	45.55%
3	CNG	3.14%
4	Electricity	0.52%
Total		**100%**

* Source: RITES Primary Survey, 2025

TABLE 2.91: FUEL MIX OF REGISTERED VEHICLES

% FUEL MIX				
TYPE OF VEHICLE	PETROL	DIESEL	GAS	ELECTRIC
2-Wheeler	81.88	-	0.31	17.80
3-Wheeler	-	4.00	31.54	68.46
4-Wheeler	43.80	29.26	22.67	4.27
Goods Vehicle (Light)	16.98	50.94	26.42	5.66

*Source: Vahan Dashboard

The survey output forms the baseline for the study. It helps to estimate the current quantity of Petrol, Diesel and CNG consumed in Jaipur. Fuel efficiency factors listed in

CMP Toolkit and national trends in fuel mix will be used with appropriate emission rates listed in CMP Toolkit and draft BS VI standards and veh-km estimated in Travel Demand Model to estimate emissions in future years.

2.21. SERVICE LEVEL BENCHMARKING

The guidelines and toolkit issued by MoHUA for the preparation of CMP suggests the comparative analysis of Urban Transport environment with benchmark values suggested in the toolkit as the Level of Service (LOS). The urban transport scenario in Jaipur has been evaluated and compared with benchmarks to diagnose the existing transport condition and to identify urgent areas for improvement in the city.

To facilitate comparison between cities and changes in performance over time, it is important that the performance levels are monitored against set benchmarks. It is in this context that the toolkit defines SLBs for various parameters of urban transport. SLBs have been identified for the following parameters:

i. Public transport facilities
ii. Pedestrian infrastructure facilities
iii. Non-Motorized Transport (NMT) facilities
iv. Level of usage of Intelligent Transport System (ITS) facilities
v. Travel speed (Motorized and Mass Transit) along major corridors
vi. Availability of parking spaces
vii. Road safety
viii. Pollution levels
ix. Integrated land use transport system
x. Financial sustainability of public transport

These parameters highlight the performance of urban transport in the city. Typically, four LOS viz. 1, 2, 3, and 4 have been specified, with 1 being the highest LOS and 4 being lowest to measure each identified performance benchmark. Therefore, the goal is to attain service level 1.

2.21.1. LOS OF PUBLIC TRANSPORT FACILITIES

SLB of Public Transport facilities is based on six parameters namely:

- Presence of Organized Public Transport System in Urban Area (%)
- Extent of Supply Availability of Public Transport
- Service Coverage of Public Transport in the city
- Average waiting time for Public Transport users (mins)
- Level of Comfort in Public Transport

- % of Fleet as per Urban Bus Specification

The city-wide LOS calculated for public transport systems during peak hours include rail or organized bus-based systems and does not include Intermediate Public Transport (IPTs) such as shared RTVs, auto-rickshaws, three-wheelers, tempos, shared taxi or other such vehicles providing point-to-point services. The analysis of public transport facilities in Jaipur has been done based on available primary and secondary data and is presented in **TABLE 2.92.**

TABLE 2.92: ANALYSIS OF PUBLIC TRANSPORT FACILITIES IN JAIPUR

S. NO.	SLBS	PARAMETERS	PRESENT STATUS	CATEGORY	LOS
1	Presence of Organized Public Transport System in Urban Area (%)	Total number of buses under the ownership of STU or SPV / Total number of buses in the city. (LOS1 = >60%; LOS4=<20%)	21.93%	20%-40%	3
2	Extent of Supply Availability of Public Transport	Number of public transport vehicles operating in the city /1000 population. (LOS1 = >0.6; LOS4=<0.2)	13.83	>0.6	1
3	Service Coverage of Public Transport in the city	Total length of the public transport corridor within the urban limits / Area of the urban limits. (LOS1 = >1; LOS4=0.3)	0.7	0.3 - 0.7	3
4	Average waiting time for Public Transport users (mins)	The average waiting time of passenger for each selected public transport route. (LOS1 <=4 mins; LOS4=>10 mins)	9 mins	6--10	3
5	Level of Comfort in Public Transport	Average load factor of all selected public transport routes. (LOS1 <=1.5 LOS4=>2.5)	1.6	1.5-2	2
6	% of Fleet as per Urban Bus Specification	Total number of buses in the city / Total number of buses as per urban bus specification (LOS1 = 75-100%; LOS4=<25%)	69%	50%-75%	2
Overall LOS					**14**

The overall calculated LOS of Public Transport facilities (LOS1 + LOS2 + LOS3 + LOS4 + LOS5 + LOS6) is 14. As per toolkit, the value of 14 of overall LOS for public transport facilities in Jaipur suggests that the City has public transport system which may need considerable improvements in terms of supply of buses/ coaches and coverage as many parts of the city are not served by it. The frequency of the services available may need improvement. The system provided is comfortable.

2.21.2.LOS OF PEDESTRIAN INFRASTRUCTURE FACILITIES

The SLB parameters for pedestrian infrastructure facilities include the following:

- Signalized intersection delay (%)
- Street Lighting (Lux)
- % of City Covered

These parameters cover the percentage of road length along the arterial and major road network or Public Transport corridors and at intersection that has adequate barrier free pedestrian facilities. However, it is evident from various surveys that pedestrian infrastructure is non-existent / heavily encroached in the city.

TABLE 2.93: ANALYSIS OF PEDESTRIAN INFRASTRUCTURE FACILITIES IN JAIPUR

S. NO.	SLBS	PARAMETERS	PRESENT STATUS	CATEGORY	LOS
1	Signalized intersection delay (%)	Number of signalized intersections having more than average waiting time of 45 seconds for pedestrians (LOS1 <25%; LOS4>=75%)	65%	50%-75%	3
2	Street Lighting (Lux)	Frequency distribution of all the LUX levels observed (LOS1=>8; LOS2= 6-8, LOS3=4-6, LOS4<4)	65% of surveyed road network has street lighting	6--8	2
3	% of City Covered	Total length of footpath having minimum width of 1.2m width or more / Total length of road network (LOS1=>75; LOS4<25)	15% of surveyed road network has footpath available	<25	4
Overall LOS					**9**

About 85% of the road network does not have any footpath due to which the calculated LOS is lowest for these parameters. Street lighting is available on 65% of the network and the same is reflected in the LOS. The calculated overall level of Service (LOS) of Pedestrian infrastructure facilities (LOS1 + LOS2 + LOS3) is 9, which is denoted by a value ranging between 9-10 indicating that the city has pedestrian facilities which may need considerable improvements. The pedestrian facilities at intersections, availability of footpath etc. need improvement as many parts of the city are not served by it.

2.21.3. LOS OF NON-MOTORIZED TRANSPORT FACILITIES

The SLB parameters for NMT facilities include:

- % of network covered
- Encroachment on NMT roads by Vehicle Parking (%)
- NMT Parking facilities at Interchanges (%)

These parameters indicate the percentage of dedicated cycle track / lane along the arterial & sub arterial road network or public transport corridors with a minimum of 2.5 m width. The service level is characterized by the continuous length of NMT lanes,

encroachment on NMT lanes, and parking facilities.

TABLE 2.94: ANALYSIS OF NON-MOTORIZED TRANSPORT FACILITIES IN JAIPUR

S. NO.	SLBS	PARAMETERS	PRESENT STATUS	CATEGORY	LOS
1	% of network covered	Total length of NMV network / total length of road network (LOS1 = >50%; LOS4=<15%)	NMT lanes are absent on the surveyed road network	<15	4
2	Encroachment on NMT roads by Vehicle Parking (%)	Total road length with Parking on Cycle Track / total length of NMT network (LOS1<=10%; LOS4=>30%)		>30	4
3	NMT Parking facilities at Interchanges (%)	Total number of interchanges having NMT parking / Total no. of Interchanges i.e. major bus stops, terminals and railway stations (LOS1=>75%; LOS4=<25%)		<25	4
Overall LOS					**12**

The level of Service (LOS) calculated for non-motorized transport facilities (LOS1 + LOS2 + LOS3) is 12. This indicates that the city lacks adequate NMT facilities.

2.21.4. LOS OF LEVEL OF USAGE OF INTELLIGENT TRANSPORT SYSTEM (ITS)

ITS refers to efforts to add information and communications technology to transport infrastructure and vehicles to manage factors that typically are at odds with each other, such as vehicles, loads, and routes to improve safety and reduce vehicle wear, transportation times and fuel consumption. GPS/GPRS systems are required so as to cover all the public transport and intermediate public transport vehicles on the "National public transport helpline" besides the use for operational efficiencies. The parameters identified to assess the level of service for level of usage of ITS are:

- Availability of Traffic Surveillance (%)
- Passenger Information System (PIS) (in %)
- Global Positioning System (GPS)/ General Packet Radio Service (GPRS) (%)
- Signal Synchronization (%)
- Integrated Ticketing System (%)

TABLE 2.95: ANALYSIS OF LEVEL OF USAGE OF INTELLIGENT TRANSPORT SYSTEM (ITS)

S. NO.	SLBS	PARAMETERS	PRESENT STATUS	CATEGORY	LOS
1	Availability of Traffic Surveillance (%)	CCTVs installed / total no. of bus stops, terminals, MRTS stations and signalized intersections (LOS1=>75%; LOS4=<25%)	57	50%-75%	2
2	Passenger Information System (PIS) (in %)	PIS installed / no. of bus stops, terminals, MRTS stations (LOS1=>75%; LOS4=<25%)	71	50%-75%	2
3	Global Positioning System (GPS)/ General Packet Radio Service (GPRS) (%)	Public Transport Vehicles and IPT with onboard GPS or GPRS connected to common control center / total no. of Public Transport Vehicles and IPT (LOS1=>75%; LOS4=<25%)	0.7	<25%	4
4	Signal Synchronization (%)	No. of synchronized signals / no. of signalized intersections in the city (LOS1=>75%; LOS4=<25%)	14	<25%	4
5	Integrated Ticketing System (%)	Public transport modes and operators for each route in the city which are integrated / total number of public transport modes and operators for each route in the city (LOS1=>75%; LOS4=<25%)	No integration available	<25%	4
Overall LOS					**16**

The level of Service (LOS) calculated for level of usage of intelligent transport system (LOS1 + LOS2 + LOS3 + LOS4 + LOS5) is 16 indicating that the city lacks adequate ITS facilities.

2.21.5. LOS FOR TRAVEL SPEEDS ALONG MAJOR CORRIDORS

This level of service provides an indication of effective travel time or speed of Public / private vehicles by taking into account indications of congestion or traffic density. This level of service is along corridors, and not indicative of an overall level of service from origin to destination. The parameters identified to assess the level of service include:

- Average Travel speed of Personal vehicles (KMPH)
- Average Travel speed of Public Transport (KMPH)

LOS is defined in terms of the average travel speed of all vehicles on the key corridors. It is strongly influenced by the number of vehicles along the corridor, number of signals per kilometer and the average intersection delay.

TABLE 2.96: ANALYSIS OF TRAVEL SPEED (MOTORIZED AND MASS TRANSIT) ALONG MAJOR CORRIDORS IN JAIPUR

S. NO.	SLBS	PARAMETERS	PRESENT STATUS	CATEGORY	LOS
1	Average Travel speed of Personal vehicles (KMPH)	Average speed along selected corridors, observed during peak hours on working day (LOS1=>30; LOS4=15)	Avg Journey speed during peak is 20.6 Kmph	15-25	3
2	Average Travel speed of Public Transport (KMPH)	Average speed of PT along selected public transport corridors, observed during peak hours on working day (LOS1=>20; LOS4=<10)	Average speed of PT is 15.5 Kmph	15-20	2
Overall LOS					**5**

The calculated level of Service (LOS) of travel speed (motorized and mass transit) along major corridors (LOS1 + LOS2) has been calculated to be 5. From the overall LOS it can be concluded that significant approach delays and average travel speed of 1/3 the free flow speed or lower. Such conditions causing a combination of one or more reasons such as high signal density, extensive queuing at critical intersections and inappropriate signal timing.

2.21.6.LOS OF AVAILABILITY OF PARKING SPACES

Parameters to calculate LOS for this SLB include:

- Availability of on street paid public parking spaces (%)
- Ratio of Maximum and Minimum Parking Fee in the City

It indicates the restriction on free parking spaces for all vehicles in a city. In the CBD of the city, the land is generally available at a premium, which makes it difficult to provide organized parking spaces in these areas. One of the management measures for reducing parking demand in the CBD is high parking charges, which discourages the use of private vehicles. Accordingly, one of the SLB parameters assesses the difference in parking fares between core and new city areas.

TABLE 2-97: ANALYSIS OF AVAILABILITY OF PARKING SPACES IN JAIPUR

S. NO	SLBS	PARAMETERS	PRESENT STATUS	CATEGORY	LOS
1	Availability of on street paid public parking spaces (%)	Available on street PAID parking spaces / Available on street Parking Spaces (LOS1=>75%; LOS4=<25%)	20%	<25	4

S. NO	SLBS	PARAMETERS	PRESENT STATUS	CATEGORY	LOS
2	Ratio of Maximum and Minimum Parking Fee in the City	Maximum parking fee being charged / Minimum parking fee being charged (LOS1=>4; LOS4<1)	5	>=4	1
Overall LOS					**5**

The calculated level of Service (LOS) of Availability of Parking Spaces (LOS1 + LOS2) obtained is 5. From the overall LOS it can be concluded that paid parking spaces provided in the city need to be improved upon and to cater to the demand some differential parking rates for the CBD need to be adopted. The city authorities need to imitate considerable improvements measures.

2.21.7. LOS OF ROAD SAFETY

With increasing road traffic, many cities are witnessing the rising level of accidents, leading to rising levels of injuries and fatalities. Level of fatality is an indication of road safety. Road design and available road infrastructure, traffic management and other such reasons significantly contribute to road safety. Therefore, the fatality rate needs to be monitored. The benchmark for the same is zero, as ideally fatalities and injuries out of accidents should be brought down to nil. The parameters included to calculate LOS for this SLB are:

- Fatality rate per lakh population
- Fatality rate for pedestrian and NMT (%)

Within the number of accidents, the vulnerable road users are pedestrians and persons with non-motorized vehicles. It is therefore, critical to monitor the extent to which such road users are impacted within the overall set of road users. The benchmark value for the same is also zero.

TABLE 2.98: ANALYSIS OF ROAD SAFETY IN JAIPUR

S. NO.	SLBS	PARAMETERS	PRESENT STATUS (YEAR 2016)	CATEGORY	LOS
1	Fatality rate per lakh population	LOS1<=2 persons; LOS4>6 persons	23.90	>6	4
2	Fatality rate for pedestrian and NMT (%)	LOS1<=20%; LOS4>60%	40-60%	40-60%	3
Overall LOS					**7**

The overall LOS of road safety obtained is 7. From the overall LOS it can be concluded that the Level of Fatality rate in a city is very high. High rate of fatality can be contributed to lack of traffic management, especially at intersections, lack of organized

public transport system and lack of enforcement.

2.21.8. LOS OF POLLUTION LEVELS

This indicates the level of air pollutants in the city i.e. average level of pollution in urban areas. The indicator to calculate the pollution levels is Annual Mean Concentration Range (µg/m3). Parameters to assess the LOS for this SLB are:

- Level of SO2
- Level of Oxides of Nitrogen
- Level of RSPM (Size less than 10 microns)

TABLE 2.99: ANALYSIS OF POLLUTION LEVELS IN JAIPUR

S. NO.	SLBS	PRESENT STATUS	CATEGORY	LOS
1	SO2; LOS1=0-40, LOS2= 40-80, LOS3= 80-120, LOS4>120	9.8	0-40	1
2	Oxides of Nitrogen; LOS1=0-40, LOS2= 40-80, LOS3= 80-120, LOS4>120	41.0	40-80	2
3	RSPM (Size less than 10 microns); LOS1=0-40, LOS2= 40-80, LOS3= 80-120, LOS4>120	126.9	>120	4
Overall LOS				**7**

*Source: Central Pollution Control Board, Annual reports

The overall LOS of pollution levels obtained is 7 in the range of 6-9. From the overall LOS it can be concluded that the city need some improvements in emission standards, checking pollution etc.

2.21.9. LOS OF INTEGRATED LAND USE TRANSPORT SYSTEM

It Indicates the effectiveness of land use-transport arrangements and identify the level of integrated land use transport system expected to result in overall trip reduction and mode shift in favor of public transit. The parameters are:

- Population Density - Gross (Persons/Developed Area in hectare)
- Mixed Land-use on Major Transit Corridors/Network (% non-residential area)
- Intensity of Development city wide - (Floor Space Index - Master Plan/DP)
- Intensity of development along transit corridor- Ratio of FSI on Transit corridor to city FSI (provision as per Master Plan / Development Plan/ Any other policy)
- Clear pattern and Complete network
- Area under roads (%)
- Proportion of network having exclusive ROW for Transit

TABLE 2.100: ANALYSIS OF INTEGRATED LAND USE TRANSPORT SYSTEM IN JAIPUR

S. NO.	SLBS	PARAMETERS	PRESENT STATUS	CATEGORY	LOS
1	Population Density – Gross (Persons/ Developed area in hectare)	LOS1>=175, LOS2=150 – 175, LOS3=125 – 150, LOS4<125	135	125-150	3
2	Mixed Land-use on Major Transit Corridors / Network (% area under Non-residential use)	LOS1>=30, LOS2=, LOS2=15 - 30, LOS3= 5 – 15, LOS4<5	8	5--15	3
3	Intensity of Development – City wide (FSI)	LOS1>=2, LOS2= 1.5 – 2.0, LOS3= 1.0 – 1.5, LOS4<1	<1	<1	4
4	Intensity of development along transit corridors (FSI transit corridor/ FSI)	LOS1>=2, LOS2= 1.5 – 2.0, LOS3= 1.0 – 1.5, LOS4<1	1-1.5	1-1.5	3
5	Clear Pattern and Completeness of the network	LOS1 = Clear pattern (ring-radial or grid-iron) and complete network, LOS2= Somewhat clear pattern (ring radial or grid iron) but somewhat in complete network, LOS3= Somewhat unclear pattern and in complete network, LOS4 = No clear pattern incomplete / sparse network	Clear pattern (grid-iron) but somewhat incomplete network		2
6	% of area under Roads	LOS1>=15 , LOS2= 12 – 15, LOS3= 10 – 12, LOS4<10	3%	<10%	4
7	%age network having exclusive ROW for Transit network	LOS1>=30, LOS2= 20-30, LOS3= 10-20, LOS4<10	12%	10%-20%	3
Overall LOS					**22**

The calculated level of Service (LOS) of integrated land use transport system = (LOS1 + LOS2 + LOS3 + LOS4 + LOS5 + LOS6 + LOS7) is 22. As per the SLB of MoHUA, the overall LOS of 22 suggests that inconsistency in the city structure and public transport system leads to lesser ridership and high dependence on personalized motor vehicles.

2.21.10. LOS OF FINANCIAL SUSTAINABILITY OF PUBLIC TRANSPORT

For calculating the LOS for financial sustainability of public transport, the parameters are:

- Extent of Non-Fare Revenue (%): All city transit system operators to achieve a minimum of 20% and above share.
- Staff /bus ratio: To keep at a level as defined in LOS 2 or above.
- Operating Ratio: To take the operating ratio to at least 1.

TABLE 2.101: LOS OF FINANCIAL SUSTAINABILITY OF PT IN JAIPUR

S. NO.	SLBS	PARAMETERS	PRESENT STATUS	CATEGORY	LOS
1	Extent of Non-fare Revenue (%)	LOS 1>40, LOS2= 40 – 20, LOS3= 20 – 10, LOS<=10	<10%	<10	4
2	Staff /bus ratio	LOS 1<=5.5, LOS2= 5.5 – 8, LOS3= 8 – 10, LOS>10	3.25	<5.5	1
3	Operating Ratio	LOS 1<0.7, LOS2=0.7-1, LOS3= 1-1.5, LOS>=1.5	2.4	>1.5	4
Overall LOS					**9**

The calculated level of Service (LOS) of financial sustainability of public transport by bus = (LOS1 + LOS2 + LOS3). The overall LOS obtained is 9, which suggests that the public transport of a city is financially sustainable but needs considerable improvements.

CHAPTER – 3
TRANSPORT DEMAND ASSESSMENT

3. TRANSPORT DEMAND ASSESSMENT

3.1. DEVELOPMENT OF BUSINESS AS USUAL SCENARIOS

3.1.1. COVERAGE

The travel demand assessment in urban environment is a complex exercise involving a large number of parameters and warrants the development of a travel model at the city level. The travel demand modelling process consists of the development of formulae (or models), enabling forecast of travel demand, and development of alternative strategies for handling this demand. It is not just one model, but a series of interlinked and interrelated models of varying levels of complexity, dealing with different facets of travel demand. Through these models, the transportation study process as a whole is checked and calibrated before it is used for future travel predictions.

While a number of commercially acceptable softwares are available for the purpose of modelling travel demand, due heed was paid to the observed traffic heterogeneity in the study area. After analysing specific model requirements and software compatibility, PTV VISUM software is recommended for modelling exercise for the study.

Detailed traffic and travel surveys have been carried out as part of the assignment to establish the existing and future travel demand. The operational travel demand model is also a prerequisite so that consultants are able to validate actual travel patterns (as observed) within an acceptable error range (+-15%). The standard 4 stage Urban Transport Planning System model has been adopted that inter alia consists of:

- Stage 1 - Trip Generation and Attraction Sub Model
- Stage 2 - Trip Distribution Sub Model
- Stage 3 - Modal Split Sub Model
- Stage 4 - Assignment Sub Model

A commuter decides on his/ her selection of travel modes, considering a number of parameters, including accessibility of travel mode from the house, total travel time, total cost of travel, convenience/ comfort of travel and cost/ convenience for reaching the destination at the other end of the main journey. The commuter evaluates the merits and demerits of all possible alternative modes and their combinations before deciding on the final selection of travel mode(s).

Updated base maps for identified locations, areas, junctions and intersections collected from the respective agencies as a part of secondary data collection

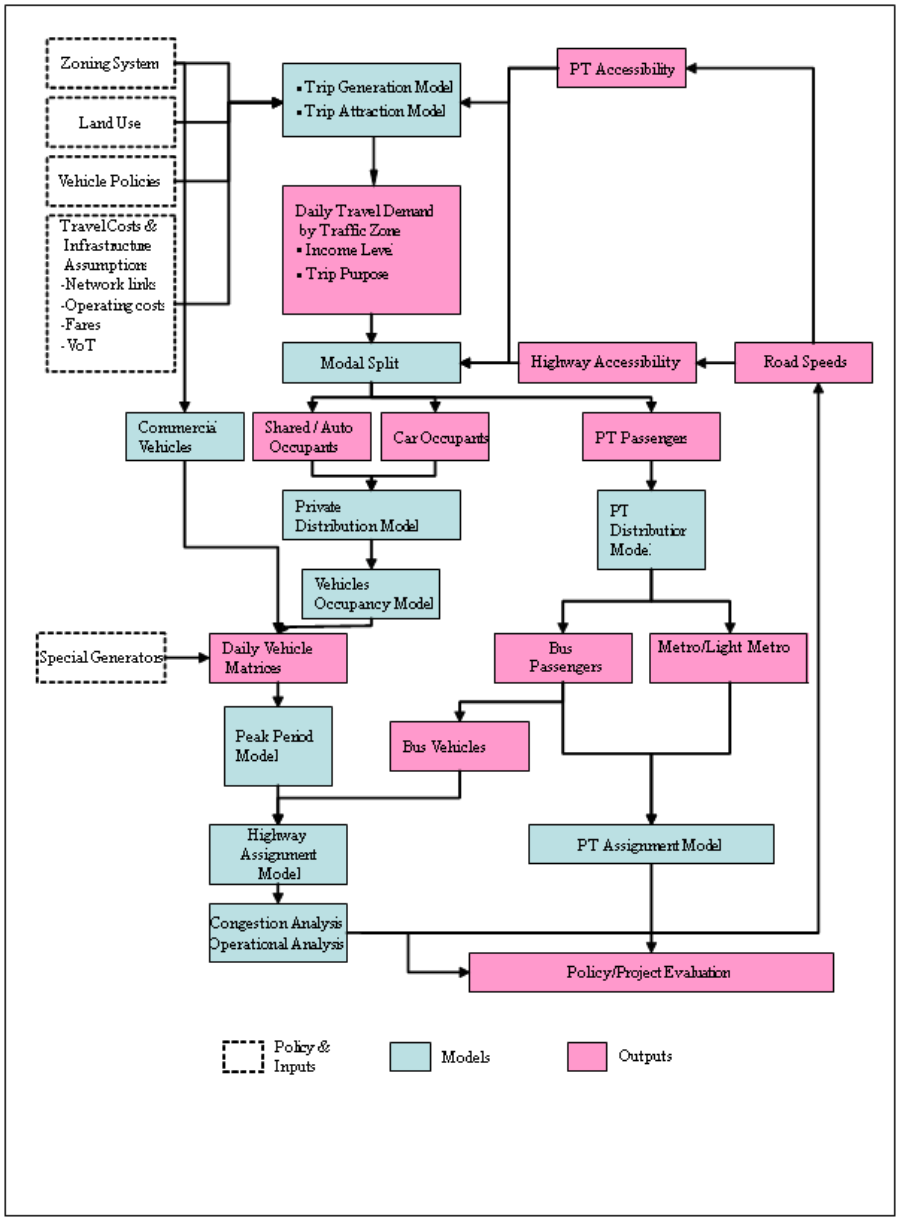
exercise helped in development of transport network of the Study Area. The transport network consisting of primary and secondary road network was coded in PTV VISUM. The link attributes such as speed, carriageway, ROW, length etc. are derived from Inventory, Speed and Delay survey data.

Major inputs to an urban travel demand model may be summarized as below:

- Delineation of study area into smaller traffic zones, road and public transport network along with their attributes
- Population and employment (existing and proposed at traffic zone level)
- Various transport systems along with their capacity, headways and speed etc.
- Intermodal integration facilities available and time required for passengers to interchange from one mode to another including walk time.

The sequences of activities involved in the model are given in **FIGURE 3.1.**

FIGURE 3.1: FOUR STAGE TRAVEL DEMAND MODEL



The base map developed on the basis of secondary data contains information related to sector boundaries, ward boundaries and road/rail networks. A traffic zone system has been developed based on existing sector/ward boundaries and natural physical barriers. Due consideration has been given to the zone system adopted in previous studies and distribution of road & public transportation networks in the study area. The zoning system is sufficiently detailed to capture inter zonal trips.

The study area has been divided into a total of 190 internal zones and 12 external zones. For Jaipur City, the municipal corporation wards have been designated as traffic zones unaltered, leveraging the availability of demographic and socio-economic data such as population and employment. In the rural areas within the study boundary but outside the municipal limits, zones have been delineated based on homogeneous land use and key traffic generation points.

Zone connectors are included in the model to allow the trip matrices to be assigned to the road network. All zones are provided with at least one zone connector. The location and definition of the connector is intended to assimilate, as far as possible, the actual connectivity of trip generation centres to the road network.

The zone system and coded road network is presented in **FIGURE 3.2 & FIGURE 3.3** respectively.

FIGURE 3.2: ZONING SYSTEM FOR JAIPUR CITY

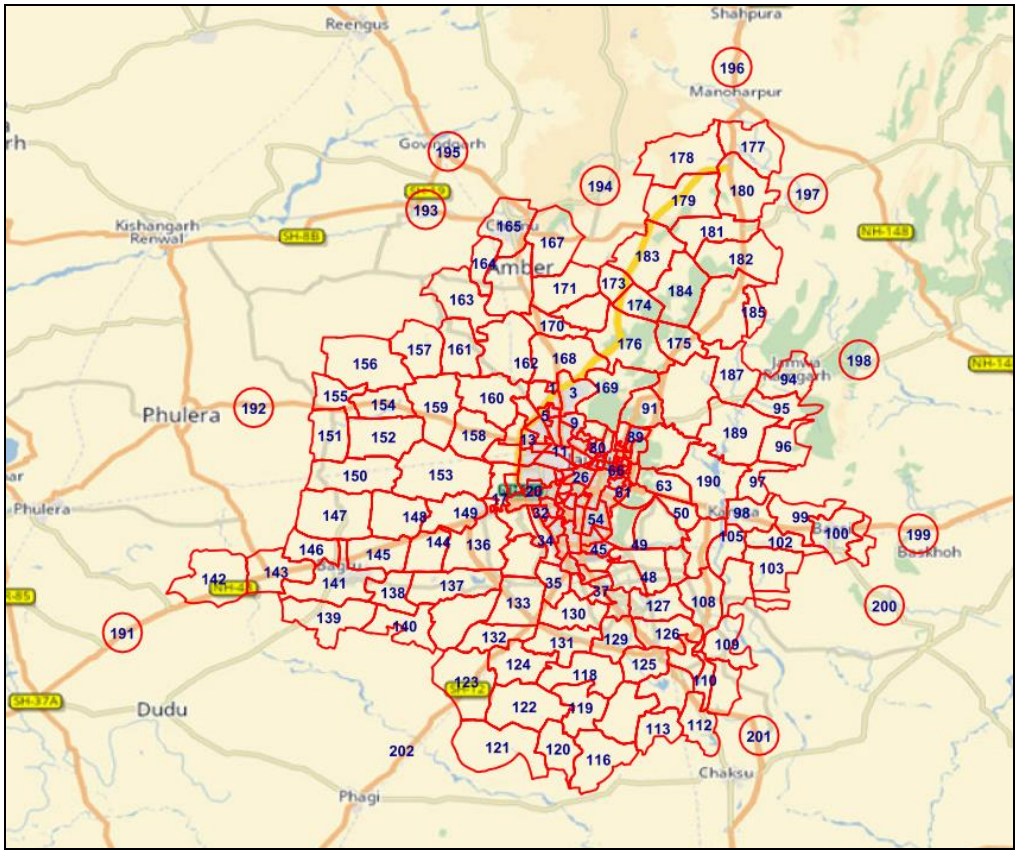
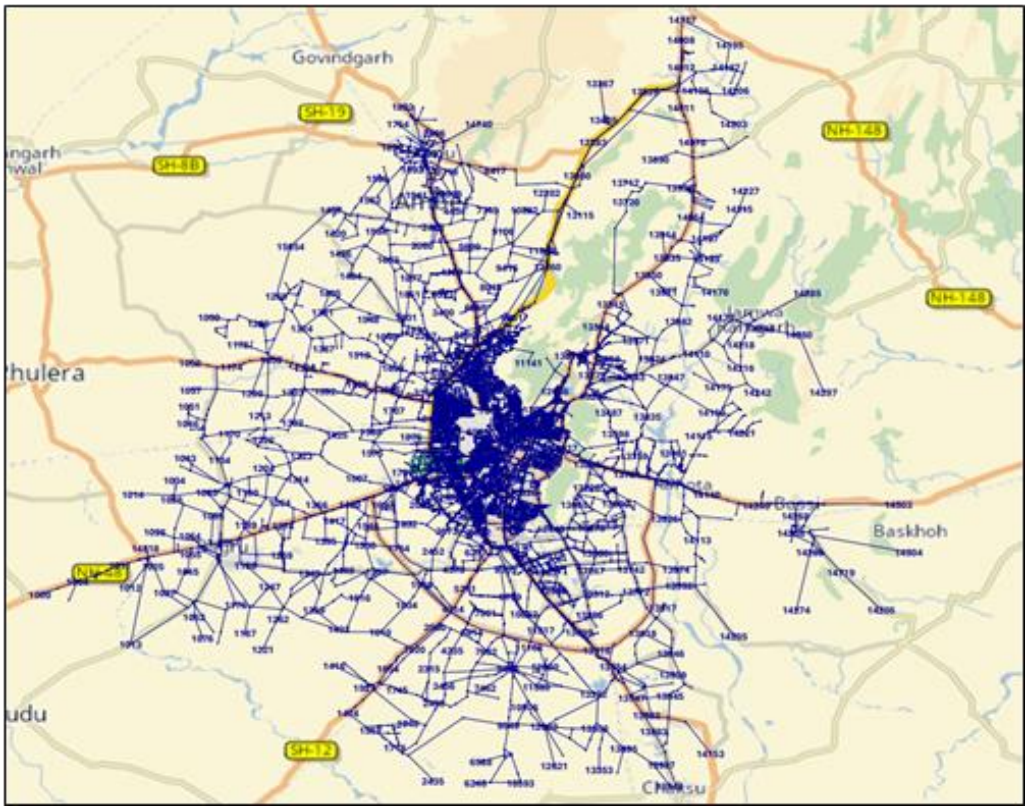


FIGURE 3.3: CODED BASE YEAR ROAD NETWORK



3.1.2. SOCIO-ECONOMIC PROJECTIONS

a) Landuse Transitions

Estimation of planning parameters is one of the important aspects of traffic demand modelling exercise. Planning parameters include population and employment of the study area. The Landuse transitions have been taken into account while projecting the future years' population and employment.

The Census 2011, Master Plan, Development plan, existing & proposed land-use, and CTTS Jaipur, 2022 have been taken as base for this exercise. The estimation is done for both the base year 2024 and horizon years 2031, 2041, 2051 and 2055. The stakeholders' views on direction of city growth and anticipated population & employment growth across different sectors for various horizon years have been taken into account. A preliminary reconnaissance was also carried out by RITES team to make an assessment of the present level of land use developments in various traffic zones.

b) Demographic Projection

The population of the towns surrounding Jaipur is expected to experience rapid growth driven by industrial and commercial development. This growth is

anticipated to result in increased traffic interactions between Jaipur and these neighboring towns.

The population forecast is based on growth trends analyzed separately for the core, middle, outer, and special areas that collectively form the study area, in addition to existing growth patterns from Census data. The outer areas are expected to grow faster than the Municipal Corporation due to urban expansion. Based on the above considerations, future population projections have been extrapolated for the horizon years 2031, 2041, 2051 and 2055, as shown in **TABLE 3.1.**

TABLE 3.1: FORECASTED POPULATION OF STUDY AREA

Year	Population (lakh)
2024	55.9
2031	66.4
2041	83.1
2051	95.8
2055	101.3

c) Employment Projection

As per Census 2011, workers constituted 34% of total population within Jaipur. Accordingly, the Work Force Participation Rate (WFPR) of 35% has been considered for estimating total employment in study area for base year 2024 resulting to a total of 19.5 Lakh workers. For the year 2031, WFPR of 36% has been assumed. However, assuming better economic conditions in future years, higher WFPR has been adopted for further horizon years. **TABLE 3.2** shows the growth trend in employment in the study area.

TABLE 3.2: WORK FORCE PARTICIPATION IN STUDY AREA

Year	2024	2031	2041	2051	2055
WFPR	35%	36%	38%	39%	39%
Employment (in Lakh)	19.5	23.9	31.6	37.3	39.5

The distribution of population and employment across various traffic zones for the horizon years is determined by analyzing Census 2011 data, the Master Plan, existing land use patterns, and population density data. Comprehensive details on the population and employment distribution for each traffic zone for the base year (2024) and the horizon years are provided in **Annexure 3.1.**

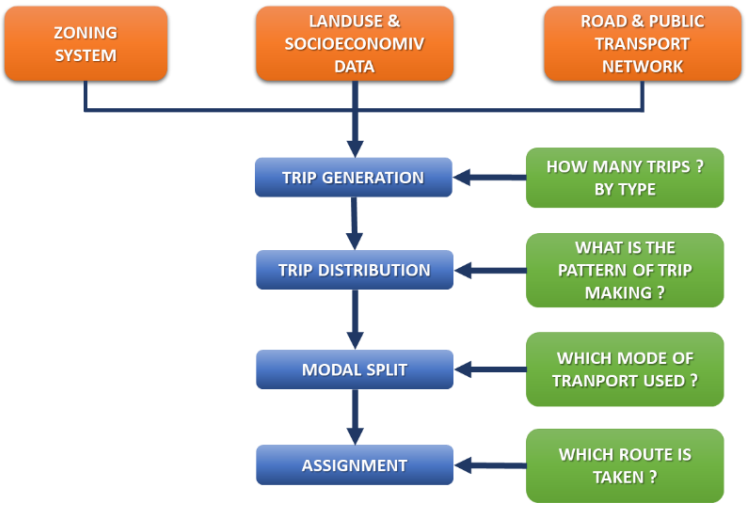
3.1.3. DEVELOPMENT OF BASE YEAR TRAVEL DEMAND MODEL

The model is based on motorised trip productions / attractions and internal trips of study area residents. These modes of travel (i.e. car, two wheeler, private auto-rickshaws & public transport including bus, mini bus and shared auto) comprise

about 67 Lakh daily trips. The remaining trips reported in household interview survey (HIS) are those relating to non-mechanised trips (walk, cycle and cycle rickshaw).

Four sub models viz. Trip Generation, Trip Distribution, Modal Split and Assignment models have been developed as shown in **FIGURE 3.4.**

FIGURE 3.4: FOUR STAGE MODEL STRUCTURE



The model development is largely based on the data from Household Interview Survey (HIS) and other primary travel surveys after expansion of the survey samples to total study area population for base year. All the data including population is calculated at traffic zone level.

The next step was to build the base year matrices necessary to obtain costs for the model development (distribution and modal choice). The base year HIS person matrices converted to vehicles using occupancy factors, trip matrices, external zones matrices from roadside interview at Outer Cordon locations and special generators (bus, airport railway station and tourists) matrices to get total traffic across the Study Area.

a) Trip Generation Model

The two components of trip generation modelling are:

Trip Production: This is defined as the home end of a home-based trip or as the origin of a non-home-based trip. It thus gives the total trips produced by a zone.

Trip Attraction: This is defined as the non-home end of a home-based trip or as the destination of a non-home-based trip. It thus, gives the total trips attracted to a zone.

The factors that may affect trip generation include land use factors such as

population, employment, intensity of residential activity and employment opportunities etc. Other household factors including household income etc. also affects the trips generated.

Trip Purpose: The purpose of trip can be broadly categorized in home based trips & non-home based trips. Home based trips are those in which one of either trip ends is at home while non-home based are those in which neither end is at home. Different transportation studies have adapted different classification systems for trip purpose depending upon the planning issues involved and the size of city. The trip generation model has been developed for home based trips in aggregation.

(i) Trip Production Sub Model

The linear regression analysis has been used to develop the trip production and trip attraction equations. A zonal regression model is used in which each traffic zone is treated as one observation. The aggregated analysis is applied for developing the model by various purpose groups which is based on the assumption that contiguous households exhibit a certain amount of similarity in travel characteristics. This assumption allows the data in a zone to be grouped and the mean value of the independent variable used in further calculations. The general form of the work trip production equation is

$$T_i = a + b*(IV_i)$$

Where,

T_i = Trips produced from zone i
a = constant (unexplained part of the relationship)
b=parameter explaining the dependency on the independent variable and representing the Trip Rate
IV_i = Independent Variable in zone i

Residences produce trips for work, education, business and other purposes including shopping, social and recreation. Activity centres such as industries, commercial centres, offices, educational institutions etc. attract these trips.

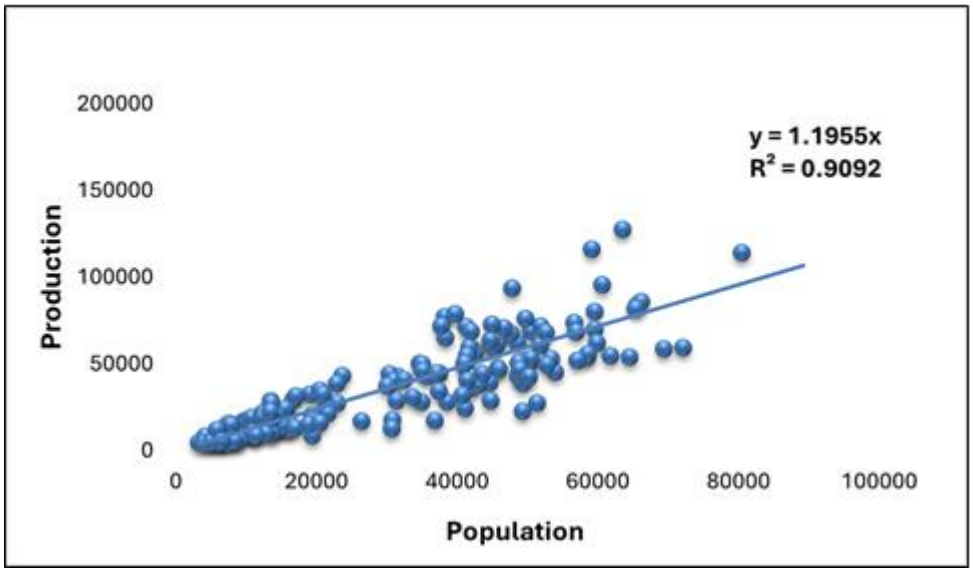
These trip production and attraction equations are calibrated as a first step. Trip production model equation is shown in **TABLE 3.3**. The generation is for home-based trip ends and therefore based on Productions / Attractions. Scatter plot for trip production is shown in **FIGURE 3.5**.

TABLE 3.3: TRIP GENERATION MODELS

Purpose	Trip Generation Models	
	Trip Productions	Trip Attractions
All purposes (Work, Business, Education & Other)	1.1955*[POP]	3.3838 *[EMP]

Where, POP: Population, EMP: Employment

FIGURE 3.5: SCATTER PLOTS FOR TRIP PRODUCTION



(ii) Trip Attraction Sub Model

The production model produces daily person trips generated by zone, whilst the attraction model estimates daily person trips attracted by zone. Trip attraction model equation is below**.** To be consistent with the generation model, the attraction model is also based on Attractions / Productions. Scatter plots for trip attraction is shown in **FIGURE 3.6.**

The coefficient of Determination R^2 is the deciding factor for linear regression analysis. The more R^2 is near to 1, more the linear regression is reliable.

The general form of the trip attraction equation is

$$T_j = a + b*(IV_j)$$

Where,

T_j = Trips attracted to zone j

a = constant (unexplained part of the relationship)

b = parameter explaining the dependency on the independent variable

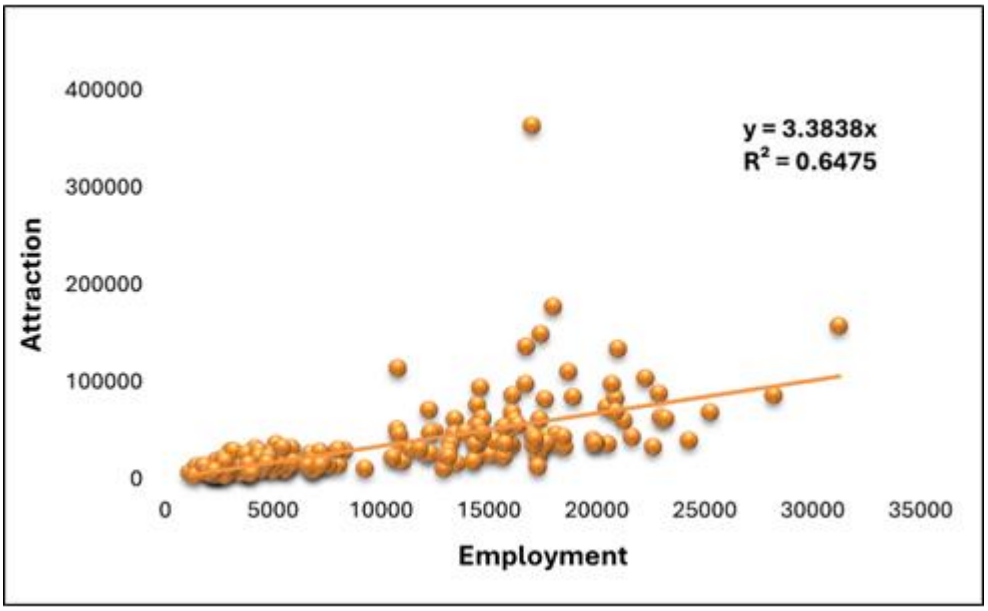
IV_i = Independent Variable in zone j

The Trip Generation Model calibration by purpose is summarized in **TABLE 3.4**. HIS and model figures are very similar, showing a very close correspondence between modelled and observed values.

TABLE 3.4: TRIP GENERATION SUB MODEL CALIBRATION RESULTS

HIS	Model	Difference
6488426	6678280	2.8%

FIGURE 3.6: SCATTER PLOTS FOR TRIP ATTRACTION



b) Trip Distribution Model

After determining the trip productions (Ti) and trip attraction (Tj), the next stage is to link the productions with attractions in order to quantify how the trips are produced in a zone and are distributed among or attracted to all other zones (Tij).

Trip Distance and Travel Time Skim matrix have been developed according to shortest path between all origin and destination pairs. The distributed OD matrix has been developed using Gravity Model of following form:

$$Tij = A_i * B_j * P_i * D_j * F(U_{ij})$$

Where,

A_i , B_j : Balancing factors

P_i : Production from i^{th} zone

D_j : Attraction to j^{th} zone and

$F(U_{ij})$: Deterrence Function which can be expressed as

$$F(U_{ij}) = e^{(c*Uij)}$$

where U_{ij} : Generalized cost of travel (distance/time) from 'i' to 'j' zone

c : Calibration parameters calculated in VISUM

The calibration coefficient as per Gravity Model as developed in model are shown in **TABLE 3.5**. As illustrated, the overall model's results are almost similar to the HIS database.

TABLE 3.5: TRIP DISTRIBUTION SUB MODEL CALIBRATION RESULTS

HIS Daily Trips	Model Daily Trips	Difference In Trips (%)	Calibration parameter (c)
6488426	6678280	2.8%	-0.23

c) Modal Split Model

Mode choice models have been developed for all modes of transport including public transport and intermediate paratransit modes. For our study, mode choice has been computed based on revealed preference of individuals surveyed in the household survey. A multi-nominal logit or Nested logit models has been run to achieve the mode choice equations.

The total trips are split into two major group of 'Private' and 'Public' mode of travel. Private modes are further divided into Car, 2W and auto. PT trips consist of Buses and Shared Autorickshaws. It should be noted that the PT matrix produced by the modal split model contains trips using Buses & Shared Auto.

The main features of the modal split model are as follows:

- **4 modes:** Car, 2wheeler, Auto (point to point service) & PT (incl. Bus shared auto)
- **Unit:** Person (productions / attractions – PA)
- **Period:** Daily
- **Model Formulation:** Combined Split, Multi-Logit Formulas (equations provided below, Where Pr (i) is the probability of decision maker choosing an alternative i and Vj is the systematic component of Utility of alternative J);

$$\mathbf{Pr(i) = exp(V_i) / \sum_{j=1}^{J} exp(V_j)}$$

- **Logit Parameters Estimation:** Utility equations are developed using multinomial logit model, this model was developed based on statistical regression analysis. The format for utility equations developed are as given below:

$$\mathbf{V_i = a_i + b_1 X^i_1 + b_2 X^i_2 _ ... + b_k X^i_k ..... + b_n X^i_n}$$

Where, Vi = Utility of mode i

a= Mode specific constant

b_k= k^{th} Parameter

X^i_k = k^{th} model variable for mode i

n= Number of model variables

The GC represents perceived costs, where the unit is minute equivalent, implying the use of Values of Time (VOT) by mode to convert monetary costs (fare and vehicle operating cost - VOC) into minutes.

Occupancy factors (OCC) are also used for car, 2w, and auto to obtain person-based GC. Below are described the GC by mode:

- **Car GC** = Time + [(VOC/OCC) / VOT] x 60;
- **2W GC** = Time + [(VOC/OCC) / VOT] x 60;
- **Auto GC** = Time + Wait Time + [(Fare / OCC) / VOT] x 60;
- **PT GC** = IVT + Walk Time + Wait Time + (Fare / VOT) x 60 + Transfer Time

Modal Split Calibration & Validation

In this study, the mode choices have been considered for modes car, two-wheeler, auto rickshaw and PT (including Bus and shared Auto Rickshaw). Using the Logistic Regression, various parameters and mode specific coefficients have been calibrated and using those parameters, utility functions have been developed taking "Car" as a reference mode.

For validation of mode choice utility function, the comparison between the existing mode share and estimated mode share as per modelling software is presented in **TABLE 3.6**.

TABLE 3.6: COMPARISON BETWEEN MODELLED AND OBSERVED MODE SHARE

Mode	HIS	Share (%)	Model	Share (%)	Difference
Car & Taxi	953760	14.7%	933745	14.0%	0.7%
2-Wheeler	2846022	43.9%	3086191	46.2%	-2.3%
IPT (Auto Rickshaw)	1382319	21.3%	1354621	20.3%	1.0%
PT (Buses & MRTS)	1306325	20.1%	1303723	19.5%	0.6%
Total	**6488426**	**100.0%**	**6678280**	**100.0%**	0.0%

d) TRIP ASSIGNMENT MODEL

Trip assignment is the stage wherein the trip interchanges are allocated to different parts of the network forming the transport system. In this stage the route to be travelled is determined and the inter-zonal flows are assigned to the selected routes. All assignment techniques are based on route selection. The choice of the route is made on the basis of number of criteria such as journey time, length, cost comfort, convenience, and safety.

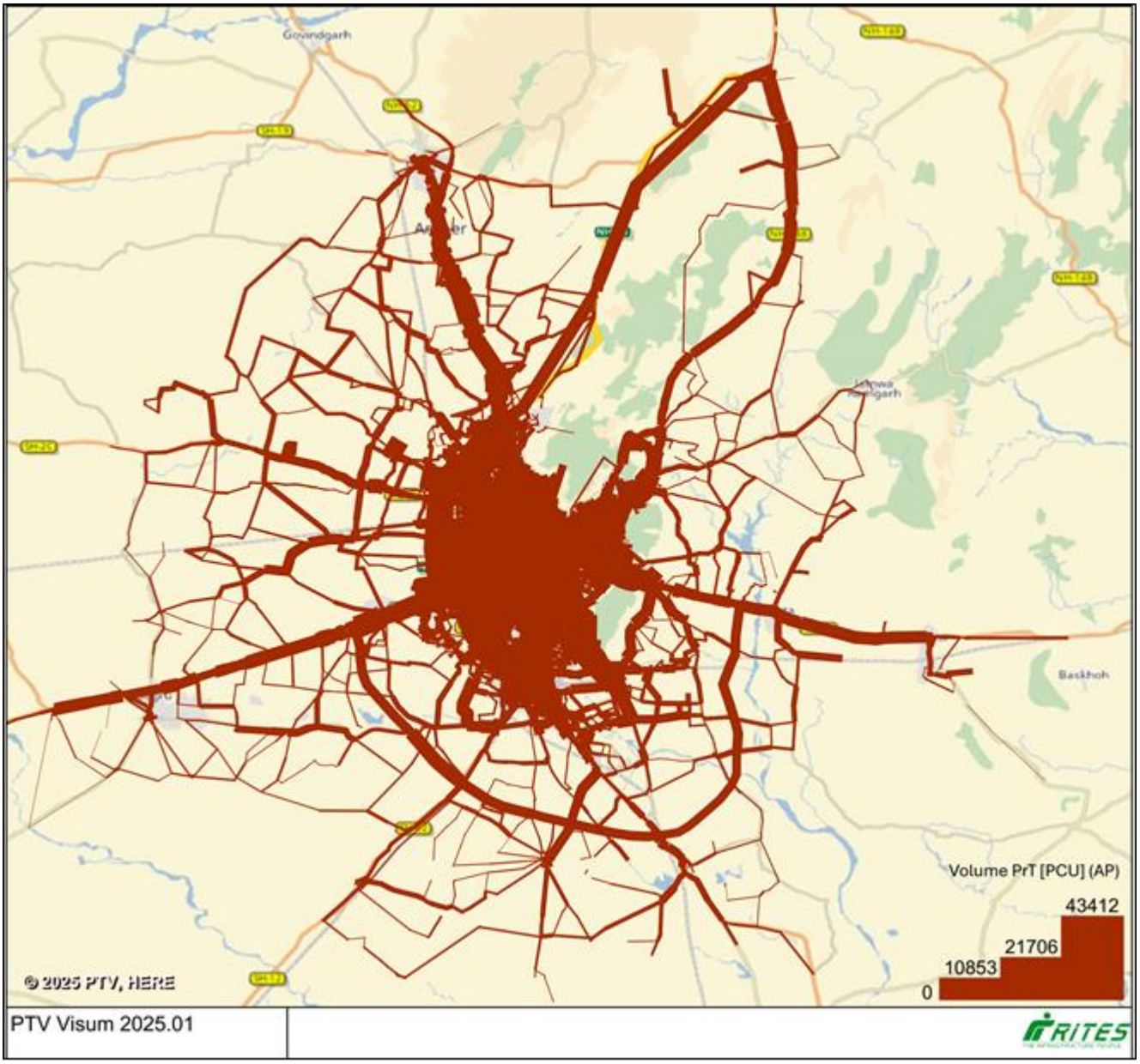
The trip assignment for the present study has been evaluated with respect to both private vehicle assignment (Highway Assignment) as well as Public Transport assignment separately with different assignment methods.

Highway assignment has been developed using the distributed O-D trip matrix for various modes obtained from modal choice stage. For this, User Equilibrium method has been considered. The procedure updates the trip assignment by

updating travel time iteratively.

The assignment is largely controlled by alternative paths, which are built by the shortest path algorithm through the network. The output of the assignment is a loaded highway network with volumes (in PCU unit) for the base year 2024 is presented in **FIGURE 3.7**.

FIGURE 3.7: ASSIGNED DAILY TRAFFIC (PCU) ON NETWORK IN BASE YEAR 2024

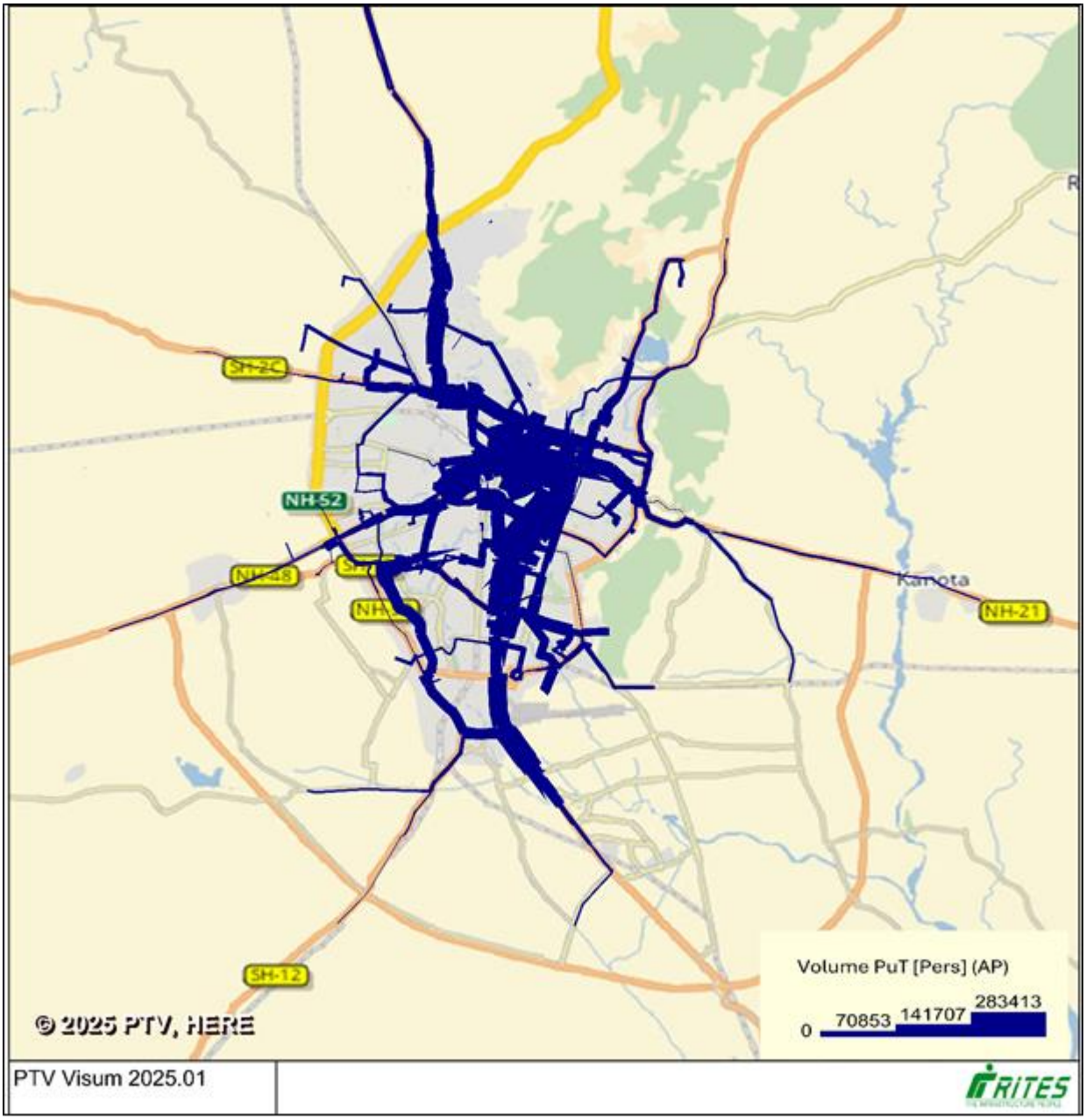


For the public transport assignment, the person trips unit is retained. The public transport network is developed from the loaded highway network, representing congested travel times on the road network. The public transport assignment considers multiple routes at an origin / destination level and includes the modelling of generalized costs for different modes. The selection of public transport route choice is based on the travel costs, including walk access time to bus or MRTS stops,

wait time, in vehicle time and fare, transfer or interchange walk times and subsequent wait times, and the time to reach the final destination. The output of the assignment is a loaded public transport network with patronage by service.

The PT assignment is based on the public transport route file built in VISUM software, which contains routes of PT (considering the directionality) in the study area. The output of the assignment is a loaded PT network with volumes (in terms of passenger) is presented in **FIGURE 3.8.**

FIGURE 3.8: ASSIGNED PT PASSENGERS IN BASE YEAR 2024



3.1.4. MODEL VALIDATION

The demand model finally provides Daily & Peak Hour person matrices by mode at the end of the process. The travel demand model needs to be validated to

determine whether it is reproducing existing traffic conditions. Model validation is undertaken by comparing the observed count data collected from the traffic volume surveys at screen line locations with their equivalent synthesized results as produced by the Model. As per standard practices, the differences between model and actual counts can vary upto 15%.

The comparison of observed and model flows across the identified screenline locations forms essential part of validation process. The validation results are quantified thorough GEH Statistics. The GEH Statistic is a formula used in traffic modelling to compare two sets of traffic volumes. It is an empirical formula that has proven useful for a variety of traffic analysis purposes. The formula for the "GEH Statistic" is:

$$GEH = \sqrt{\frac{2(M-C)^2}{M+C}}$$

Where, M is traffic count from model and C is traffic count from survey.

Using the GEH Statistic avoids some pitfalls that occur when using simple percentages to compare two sets of volumes. This is because the traffic volumes in real-world transportation systems vary over a wide range. For traffic modelling work in the "baseline" scenario, a GEH of less than 7.0 is considered a good match between the modelled and observed GEHs in the range of 7.0 to 10.0 may warrant investigation. GEH greater than 10.0 is not acceptable.

TABLE 3.7 shows the comparison of observed and model flows at identified midblock/ screen line locations.

TABLE 3.7: COMPARISON OF OBSERVED & MODEL FLOWS AT SCREEN LINE/MID BLOCK LOCATIONS

SN	Screen line	Traffic Volume (in PCU)		GEH
		Observed	Modelled	
1	Khirni Phatak	71223	69545	6.3
2	Jaipur Ajmer Road	91685	90235	4.8
3	Tonk Road	99190	100231	3.3
4	Dalda Factory Road	46289	45117	5.5
5	Jagatpura Road	86582	85256	4.5
6	Sitapura Railway Crossing	64279	63001	5.1

For the present study, traffic flows at identified midblock/screen line locations are within the acceptable error range. The model validation results show that the model replicates the existing travel situation within permissible norms of transport planning in the study area since the model figures are close to the observed data, HIS database and field traffic counts. Therefore, the next stage for travel demand

forecasting for future years shall be taken up following the model development, calibration, and validation for base year.

3.1.5. ASSUMPTIONS FOR TRANSPORT DEMAND FORECASTING

The following assumptions have been made for forecasting transport demand for the years 2031, 2041 and 2055.

(i) Calibrated and validated travel demand model has been used.
(ii) Land use parameters (population and employment) have been distributed in various traffic zones for 2024, 2031, 2041 and 2055.
(iii) Fare levels of buses and vehicle operating costs of different vehicles have been taken as same as in the base year.
(iv) Inter-city passenger to/from the study area will grow at the growth rate of 3% in various adjoining towns.
(v) The special generator passenger traffic of bus terminals and railway stations in Jaipur is expected to grow at 6% per annum respectively.
(vi) Inter and Intra-city goods traffic is expected to grow at 5% per annum up to 2055.

3.1.6. DEVELOPMENT OF BUSINESS AS USUAL (BAU) SCENARIO, 2055

Considering the above assumptions and calibrated / validated traffic demand model, forecasting of transport demand has been carried out for 'Business as Usual' (BAU) scenario in the year 2055. Overall modal split for various modes in this scenario for the year 2055 is given in **TABLE 3.8**. The intra city motorized trips modal split (% of trips by public transport to total motorized trips) in favor of public transport in 2055 is expected to be about 14% which is even lower than the existing modal share of 15.2%. The total no. of PT trips will increase from 12.6 Lakh to about 21.7 Lakh indicating a high-capacity mass transport network will be needed to address the travel demand requirements in the study area.

TABLE 3.8: DAILY INTRA CITY TRIPS BY VARIOUS MODES IN 2024 & BAU SCENARIO (2055)

Mode	BASE YEAR (2024)		BAU (2055)	
	Daily Trips	Modal Share (%)	Daily Trips	Modal Share (%)
Car	953760	11.4%	1884452	12.1%
2W	2846022	34.1%	5740834	36.9%
Auto Rickshaw	1369614	16.4%	2356231	15.1%
PT incl. Sh. Auto, E-Rickshaw, Bus, MRTS	1269324	15.2%	2176238	14.0%
Cycle	228740	2.7%	395247	2.5%
Walk	1684101	20.2%	3014702	19.4%
Total	**8351560**	**100.0%**	**15567705**	**100.0%**

a) MAJOR TRAVEL CORRIDORS

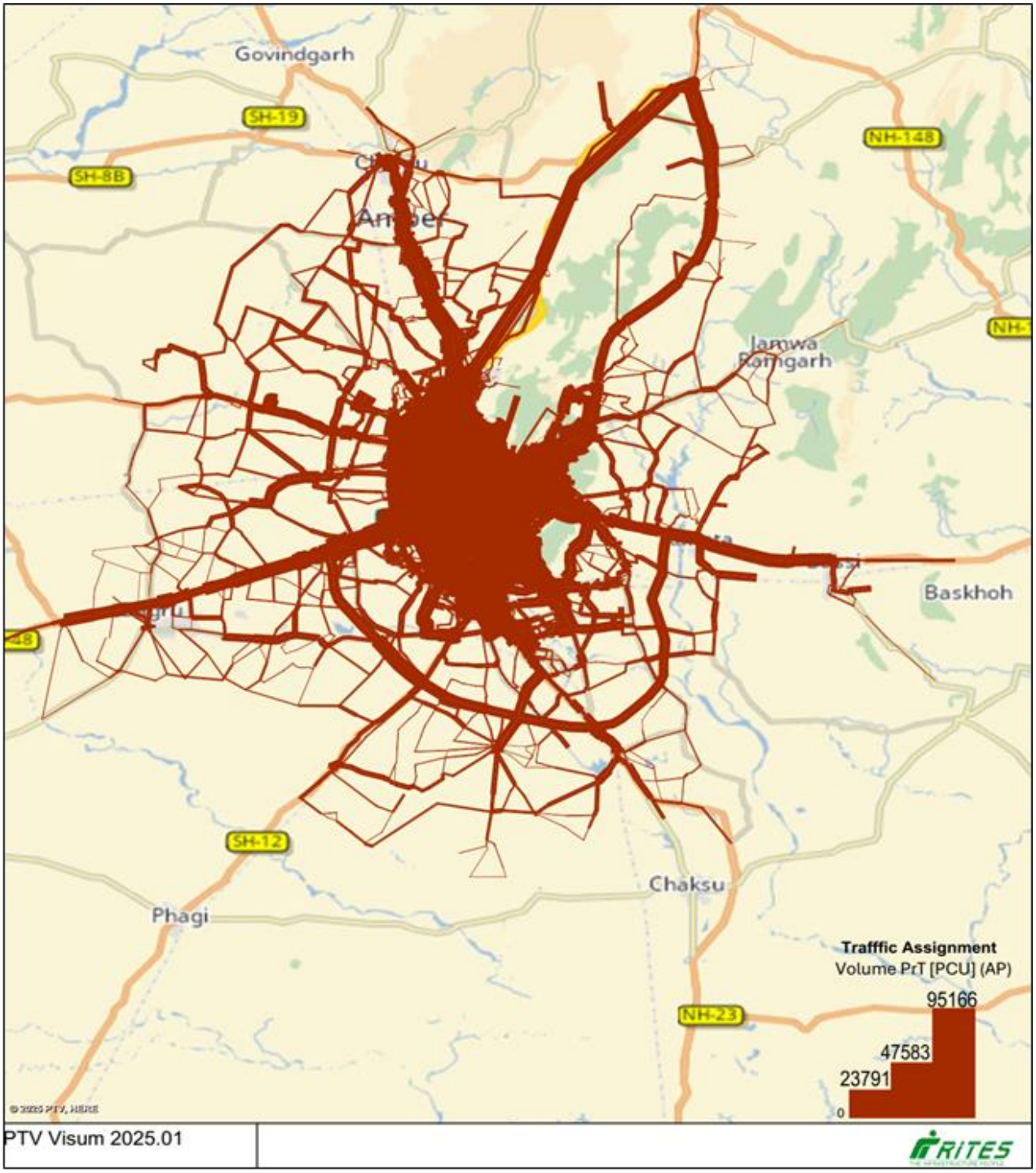
The traffic assignment on road network in the BAU scenario 2055 for peak hour traffic (in PCUs) is given in **FIGURE 3.9.** The expected transport demand on many of the road corridors cannot be met by a normal road-based transport system. Therefore, mass transport system will be required on many corridors to cater to future transport demand.

The major travel demand corridors as identified from business-as-usual 2055 scenario traffic assignment with their respective link loadings in peak hour passenger trips are detailed in **TABLE 3.9**.

TABLE 3.9: MAJOR TRAVEL CORRIDORS IN STUDY AREA - BAU 2055 SCENARIO

SN	Road name	Sections		Maximum Peak Hour peak direction Passenger Trips on Links in 2055
		From	To	
1	Tonk Road	Goner Mod	Gopal pura Mod	43100
2	Tonk Road	Gopal pura Mod	Ajmeri Gate	77100
3	Ajmer Road	200 ft Bypass Junction	Bhakhrauta	41430
4	Ajmer Road	200 ft Bypass Junction	Sodala	44250
5	Agra Road	Jawahar Nagar Circle	Sanganeri Gate	50500
6	Delhi Road (NH 248)	Jawahar Nagar Circle	Shree Guru Gobind ji Circle	38500
7	Sikar Road	Chomu puliya Circle	VKI (Harmada)	52100
8	Sikar Road	Chomu puliya Circle	Panipech Circle	74800
9	Gopal pura Bypass Road	Mansarovar	Gopal pura Mod (Tonk Road)	41000
10	New Sanganer Road	Mansarovar	Airport Circle	35600
11	Station Road	Station	Chandpole	50300
12	Hawa Sadak Road	Ram Nagar Chawraha	Ambedkar Circle	39400
13	Jhotwara Road	Kanta Chawraha	Chomu puliya Circle	34050

FIGURE 3.9: TRAFFIC ASSIGNMENT FOR PEAK HOUR TRAFFIC (IN PCU'S) ON ROAD NETWORK IN BAU SCENARIO 2055



3.1.7. ENERGY AND ENVIRONMENT MODELLING

a) Base Year (2024)

Fuel consumption for the base year has been estimated using empirical equation. Average fuel efficiencies and fuel mix of different type of vehicles as obtained from the fuel station survey are summarized in Chapter 2. Daily Veh-km by vehicle type, as estimated from travel demand model was used to calculate quantity of fuel consumed for the base year. The same is summarized in **TABLE 3.10**.

TABLE 3.10: DAILY FUEL CONSUMPTION FOR THE BASE YEAR-2024

Type of Vehicle	Fuel Consumed for Base Year			
	Petrol (L)	Diesel (L)	Gas (kg)	Electricity (in MWh)
2-Wheeler	3,23,656	0	598	1,14.55
3-Wheeler	0	4,017	19,835	79.25
4-Wheeler	1,25,842	81,640	51,139	27.22
PT	3,60,321	7,10,509	16,00,279	638.29

CO_2 emissions have been estimated using CO_2 emission coefficients for different fossil fuels. Quantum of CO_2 emissions is presented in **Table 3.11.** The emissions of other pollutants are estimated as given in **Table 3.12**.

TABLE 3.11: DAILY CO_2 EMISSIONS FOR THE BASE YEAR-2024

Type of Vehicle	CO_2 Emissions for the Base Year (in kg)			
	Petrol	Diesel	CNG	Electric
2-Wheeler	7,44,409	0	1,011	27,491
3-Wheeler	0	10,885	33,521	19,020
4-Wheeler	2,89,436	2,21,243	86,425	6,533
PT	8,28,739	19,25,480	27,04,472	1,53,189
Total	**7,051.85 Tonnes**			

TABLE 3.12: DAILY EMISSIONS OF OTHER POLLUTANTS FOR THE BASE YEAR-2024

Type of Vehicle	Vehicular Pollutant Emissions for the Base Year (in kg)		
	Petrol	Diesel	Gas
PM2.5			
2-Wheeler	158.07	0.00	0.24
3-Wheeler	0.00	4.13	6.38
4-Wheeler	18.62	24.88	4.82
Bus	0.00	729.21	404.28
NOx			
2-Wheeler	2371.10	0.00	1.80
3-Wheeler	0.00	41.33	63.79
4-Wheeler	186.25	497.68	48.20

Type of Vehicle	Vehicular Pollutant Emissions for the Base Year (in kg)		
	Petrol	Diesel	Gas
Bus	0.00	14584.13	17687.30
CO			
2-Wheeler	15807.35	0.00	29.92
3-Wheeler	0.00	123.99	637.89
4-Wheeler	1117.47	995.35	963.97
Bus	0.00	4861.38	12633.78
VOC			
2-Wheeler	9484.41	0.00	17.95
3-Wheeler	0.00	41.33	382.74
4-Wheeler	1117.47	373.26	385.59
Bus	0.00	2430.69	6064.22

In the base year, buses are the dominant source of PM2.5, NOx, and CO emissions, with diesel and gas-powered buses contributing over 1,100 kg of PM2.5, 32,000 kg of NOx, and 17,500 kg of CO daily. Among private vehicles, 2-wheelers emit substantial CO (15,807 kg) and VOCs (9,484 kg), mainly from petrol use, reflecting their high penetration and frequent usage. 4-wheelers show a balanced but significant contribution across all pollutants, particularly NOx and CO from both diesel and gas. 3-wheelers, though fewer in number, emit notable levels of NOx (105 kg) and CO (761 kg), mostly from gas fuel. Overall, the emission pattern reveals a heavy dependence on high-emission fuels, especially in public transport and two-wheelers, emphasizing the critical need for cleaner technologies and fuels in urban transport systems.

b) BAU Scenario (2055)

Fuel mix shares considered for Base year are considered for BAU scenario 2054 as summarized in Chapter 2. Accordingly, fuel consumption and emissions of CO_2 as well as other pollutants have been estimated for year 2055. The estimation was done using emission factors for CO_2 and other pollutants and fuel efficiency factors. The results are summarized in **Table 3.13** to **Table 3.15**.

TABLE 3.13: DAILY FUEL CONSUMPTION FOR BAU SCENARIO – 2055

Type of Vehicle	Fuel Consumed for BAU Scenario			
	Petrol (L)	Diesel (L)	Gas (kg)	Electricity (in MWh)
2-Wheeler	6,81,734	0	1,261	241.28
3-Wheeler	0	7,130	35,212	140.69
4-Wheeler	2,55,611	1,65,827	1,03,874	55.29
PT	8,21,957	16,20,799	36,50,524	1,456.05

TABLE 3.14: DAILY CO2 EMISSIONS FOR BAU SCENARIO – 2055

Type of Vehicle	CO_2 Emissions for BAU Scenario (in kg)			
	Petrol	Diesel	CNG	Electric
2-Wheeler	15,67,988	0	2,130	57,906
3-Wheeler	0	19,324	59,508	33,765
4-Wheeler	5,87,904	4,49,392	1,75,547	13,270
PT	18,90,501	43,92,364	61,69,385	3,49,453
Total	**15,768.44 Tonnes**			

TABLE 3.15: DAILY EMISSIONS OF OTHER POLLUTANTS FOR BAU SCENARIO – 2055

Type of Vehicle	Vehicular Pollutant Emissions for BAU Scenario (in kg)		
	Petrol	Diesel	Gas
PM2.5			
2-Wheeler	332.96	0.00	0.50
3-Wheeler	0.00	7.34	11.32
4-Wheeler	37.83	50.54	9.79
Bus	0.00	1663.45	922.24
NOx			
2-Wheeler	4,994.38	0.00	3.78
3-Wheeler	0.00	73.37	113.24
4-Wheeler	378.30	1,010.88	97.90
Bus	0.00	33,269.02	40,347.89
CO			
2-Wheeler	15,807.35	0.00	29.92
3-Wheeler	0.00	123.99	637.89
4-Wheeler	1,117.47	995.35	963.97
Bus	0.00	4,861.38	12,633.78
VOC			
2-Wheeler	9,484.41	0.00	17.95
3-Wheeler	0.00	41.33	382.74
4-Wheeler	1,117.47	373.26	385.59
Bus	0.00	2,430.69	6,064.22

Under the BAU scenario, fuel consumption and emissions remain heavily skewed towards fossil fuels. Buses are the largest consumers, using 17 lakhs litres of diesel, 38 lakhs kg of gas, and generating over 111 lakhs kg of CO_2, including significant contributions from CNG and electricity. Two-wheelers, powered mostly by petrol, consumed over 680,000 litres, resulting in 16 lakhs kg of CO_2 and notable emissions of CO (15,807 kg) and VOCs (9,484 kg). Four-wheelers also recorded substantial fuel use across all fuel types and emitted over 12 lakhs kg of CO_2, with diesel and CNG being major contributors. Three-wheelers, although consuming lower absolute quantities of fuel, produced considerable emissions, particularly from gas. In terms of air pollutants, buses again dominate with very high NOx (73,600 kg) and PM2.5

(2,586 kg) emissions. The pattern indicates that without intervention, BAU will perpetuate high fuel consumption and pollutant loads, emphasizing the critical need for a modal shift and cleaner technologies.

3.1.8. CONCLUSION

The daily CO_2 emissions are projected to rise from the current **7,051.85 Tonne/day** to **15,768.44 Tonne/day** in the year 2055 under the Business-as-Usual scenario. It can be concluded from these results that if we continue on the current path of high motorization and neglecting the role of Walk, NMT and Public Transport based trips in the overall transport scenario of Jaipur, high level of environment degradation will be experienced.

3.2. DEVELOPMENT OF SUSTAINABLE URBAN TRANSPORT SCENARIOS

3.2.1. FRAMEWORK FOR SCENARIOS

Business As Usual (BAU) scenario with decreasing share of public transport, Non-Motorized Transport (NMT) and walk, will not lead the city towards national goals of sustainable transport and climate change. In order to achieve these goals, Landuse, Public Transport, NMT and Technological Transitions have been considered as strategies for developing various Sustainable Urban Transport (SUT) scenarios. It is expected that adoption of the SUT scenario will fulfill the objective of enhancing economic and social development while mitigating CO_2 emissions within the city. This will enable the city to handle the mobility challenges while considering climate change and the local environment. The SUT scenarios are based on the following principles:

- Changes in urban structure
- Enhanced use of non-motorized and public transport infrastructures
- Deep emission cuts using low carbon energy sources
- Use of highly efficient technologies in vehicles

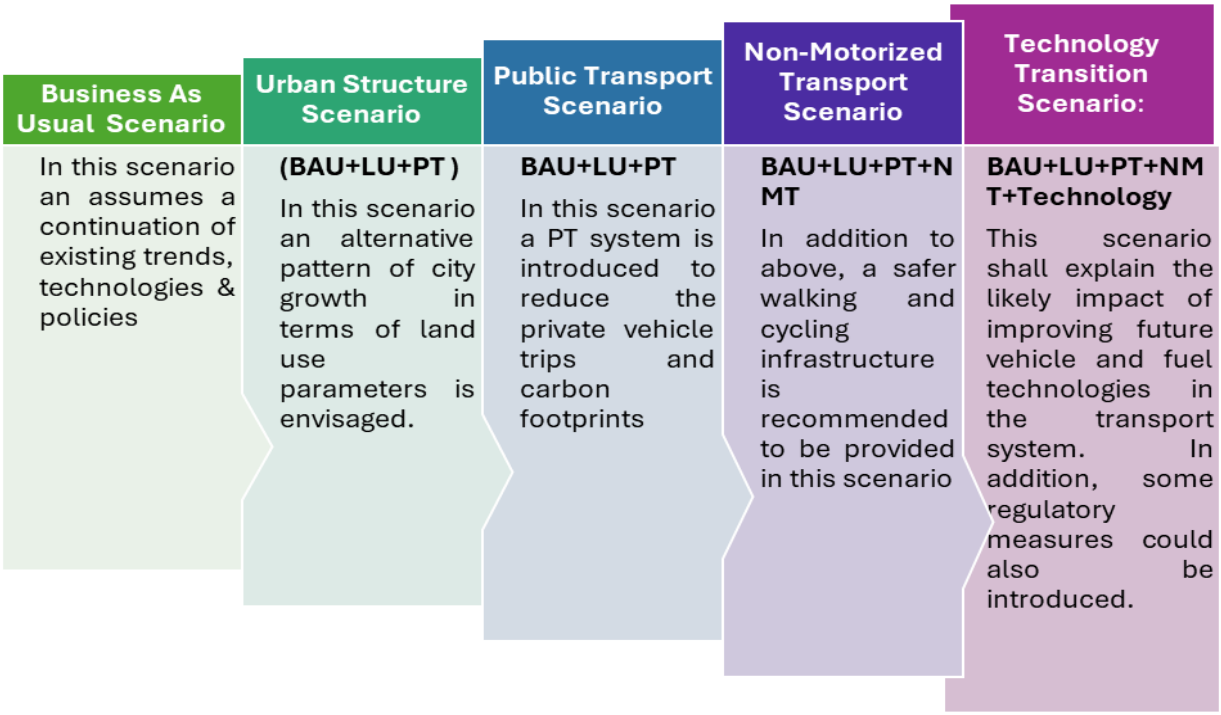
CMP will identify investment priorities to help achieve the sustainable transport goals. Though the sustainable scenarios will assume an increase in motorized transport to some extent, emphasis has been placed on improving technology in terms of efficiency and emissions. Following four SUT Scenarios have been formulated:

- **Urban Structure Scenario**: Intensive development along high demand PT corridors.
- **Public Transport Scenario**: In addition to Scenario 1, augmentation of PT system.

- **Non-Motorized Transport Scenario**: In addition to Scenario 1 and 2, augmentation of NMT/walk facilities.
- **Technology Transition Scenario**: in addition to Scenarios 1, 2 and 3, possible shift to alternative fuels through use of highly efficient technologies.

These strategies will deliver desired benefits when implemented collectively. These strategies are presented in subsequent paragraphs to gauge the individual effect in developing sustainable transport in the city.

FIGURE 3.10: SUSTAINABLE URBAN TRANSPORT SCENARIOS



3.2.2. TRANSPORT DEMAND ANALYSIS OF ALTERNATIVE STRATEGIES FOR SUSTAINABLE URBAN TRANSPORT

a. URBAN STRUCTURE SCENARIO

i. Landuse Transition

Urban sprawl and uncontrolled growth of cities result into increase in trip lengths which is not desirable. Accordingly, compact development of the city is envisaged with high density and multi-nuclei development to increase share of walk and NMT and improve access to public transport. To achieve higher density and compact development, changes in planning and regulatory measures such as zoning regulations and floor area ratio (FAR) are required.

The BAU scenario considers land use pattern as proposed by the Master Plan - 2025, concentrating the commercial activity in different areas of city. Planning new

commercial activities to outgrowths of the city would result in better distribution of population and employment, decongesting the core areas as people in the outgrowths would not need to travel to the core city for their work, shopping and other activities. However, this would not discourage the use of motorized modes of transport and will increase the carbon footprint of the city.

As such, in the Urban Structure Scenario, an alternative pattern of city growth is envisaged where the commercial activity is spread across the entire city, primarily along the major travel demand corridors. This scenario will promote a better urban structure for the city and will also ensure the success of an organized public transport in the city.

ii. Projections and Distribution of Population in Urban Structure Scenario

The urban structure strategy envisages higher population along the major travel corridors. Accordingly, some of the high demand corridors identified under the BAU scenario are planned to be developed intensively by increase in FSI/FAR. This presents us with three categories of Traffic Analysis Zones (TAZ) namely:

- Class 1: Zones along major travel corridors
- Class 2: Core Area Zones
- Class 3: Non-Core Area Zones

While the overall population for the city is same as that of BAU scenario, the distribution of population by traffic zones changes in the Urban Structure scenario in accordance with the above classification of TAZs. The overall population growth in Class 1 is assumed to be more than 100% from the year 2024 to year 2055, the population in Class 2 and 3 TAZ is assumed to be increased by 40 - 45%. The final population for the three classifications of zones is about 45.20 Lakh, 15.19 Lakh and 40.92 Lakh for Class 1, 2 and 3 respectively in the year 2055 totaling to 101.31 Lakh.

It is expected that the increase in FSI/FAR will not only concentrate the population along travel corridors but will also marginally induce population in the city, not reflected in the projections for BAU scenario. An additional population of about 2% of the base year population (1.12 Lakh) is assumed to be induced as indirect effect of the land use transitions under this scenario.

Based on the above assumptions, the city's population projected for the year 2055 is 102.43 lakh.

iii. Projection and Distribution of Employment in Urban Structure Scenario

Similar to the methodology adopted for projecting population for this scenario, employment figures have also been projected considering increase in employment

opportunities along major travel demand corridors. The classification of TAZ with underlying assumptions for projecting employment is given as under:

- **Class 1 (Zones along major travel corridors)**: These are the zones in the influence area of major travel corridors. The share of these zones in the city's existing employment is 30%. The high FSI and FSR coupled with proximity to public transit are expected to have a major impact on creation of employment opportunities in these zones. As such, the share of these zones in city's overall employment in horizon year (2055) has been assumed to increase to 46%.

- **Class 2 (High employment zones)**: These are the zones with share of employment is 9% share in city's base year employment. However, as these zones are already congested, the growth of these zones is assumed to be impacted negatively due to projected positive growth of Class 1 zones. As such, the share of these zones in horizon year (2055) city's employment is assumed to be reduced to 7%.

- **Class 3 (Core Area Zones)**: Apart from the existing high employment zones and future high employment zones assumed along major travel corridors, there are zones which fall in the core area/main city but are not covered under any of the above two classes. The employment share of these zones in the base year is 11%, which is assumed to reduce to 9% by 2055 due to the advent of Class 1 and organic growth of Class 2 zones.

- **Class 4 (Non-Core Area Zones)**: These zones generally lie in the outgrowths of the city and are not under the direct influence of a transit corridor or are an existing high employment zone. The employment share of these zones in the base year is 50% which is assumed to reduce to 37% in the year 2055.

As in the case of population, the change in the urban structure is expected to induce new employment in the city. An additional employment of about 2% of total employment is assumed in the year 2055 under the Urban Structure scenario (i.e. 39,000). Based on the above assumptions, total employment projected for the year 2055 is 39.9 lakh.

The zone-wise distribution of population and employment projected for each Traffic Analysis Zone (TAZ) under the Urban Structure scenario for various horizon years is outlined in **TABLE 3.16**

TABLE 3.16: ZONE-WISE DISTRIBUTION OF UT SCENARIO POPULATION AND EMPLOYMENT

Zone	POPULATION				EMPLOYMENT			
	2031	2041	2051	2055	2031	2041	2051	2055
1	58557	86435	103436	112555	21473	34812	42185	45187
2	92856	137065	164024	178485	34052	55204	66894	71657
3	114001	168276	201374	219128	41806	67775	82129	87975
4	58415	86226	103186	112283	21421	34727	42083	45078
5	54282	80126	95886	104341	19906	32272	39107	41890
6	64981	95918	114784	124904	23829	38630	46812	50144
7	76467	112874	135074	146982	28042	45460	55087	59008
8	69815	103055	123324	134197	25602	41505	50296	53876
9	87535	129211	154624	168258	32100	52040	63062	67551
10	82794	122212	146248	159142	30361	49221	59647	63892
11	65826	73792	82027	84700	24084	28695	33790	35825
12	42965	48670	54683	56727	15199	17438	19772	20619
13	85920	126827	151771	165152	31507	51079	61897	66303
14	70386	103897	124332	135294	25811	41843	50706	54316
15	65461	96627	115632	125827	24006	38917	47159	50516
16	71102	104954	125595	136669	26074	42271	51224	54869
17	71526	105580	126346	137485	26229	42521	51528	55196
18	63153	93219	111555	121390	23160	37545	45496	48734
19	93774	138419	165644	180248	34388	55749	67556	72365
20	75589	111577	133522	145294	27719	44938	54456	58332
21	73556	108576	129931	141387	26973	43728	52989	56762
22	57188	64108	71263	73585	20923	24928	29354	31123
23	46744	52951	59493	61716	16536	18970	21509	22431
24	68893	101693	121694	132424	25264	40957	49632	53165
25	53625	60115	66823	69001	19630	23405	27581	29252
26	66165	74172	82450	85137	24208	28843	33965	36011
27	46557	52191	58015	59906	17034	20295	23899	25338
28	38576	43245	48071	49638	14114	16817	19803	20996
29	57336	64275	71448	73777	20978	24994	29433	31206
30	54720	61343	68188	70410	20021	23854	28089	29781
31	50775	56920	63272	65335	18577	22134	26064	27634
32	57166	64756	72758	75477	20224	23201	26306	27434
33	64631	95401	114165	124230	23700	38422	46560	49874
34	51121	57909	65064	67496	18084	20747	23524	24532
35	66278	75078	84355	87508	23446	26898	30498	31805

Zone	POPULATION				EMPLOYMENT			
	2031	2041	2051	2055	2031	2041	2051	2055
36	65158	73810	82930	86029	23050	26443	29982	31268
37	102188	150839	180506	196421	37474	60752	73619	78859
38	71445	105459	126201	137328	26199	42474	51470	55133
39	63030	71400	80221	83219	22297	25579	29003	30247
40	46780	52992	59540	61764	16548	18985	21526	22449
41	49766	56375	63340	65707	17606	20197	22900	23882
42	25553	28946	32522	33737	9039	10370	11758	12262
43	47329	53613	60237	62489	16744	19208	21778	22712
44	80827	119309	142774	155363	29640	48053	58230	62375
45	83785	123674	148000	161048	30724	49810	60359	64655
46	91430	134961	161505	175744	33528	54355	65867	70555
47	42579	48233	54192	56217	15062	17279	19592	20432
48	47877	54234	60935	63213	16937	19430	22031	22976
49	50131	56788	63804	66188	17734	20345	23068	24057
50	58741	66541	74762	77557	20780	23839	27030	28189
51	53193	60256	67701	70231	18818	21588	24478	25527
52	54260	61465	69060	71641	19196	22021	24969	26039
53	42043	47626	53511	55510	14873	17062	19346	20176
54	77163	87409	98209	101879	27297	31316	35507	37029
55	70430	103962	124409	135378	25827	41871	50739	54350
56	54452	61682	69303	71893	19263	22099	25057	26131
57	53044	60087	67511	70034	18765	21527	24409	25455
58	71192	105086	125754	136841	26107	42323	51286	54937
59	89987	132831	158957	172971	32999	53498	64828	69442
60	45747	51821	58224	60400	16183	18565	21050	21953
61	51968	58868	66142	68614	18384	21091	23913	24938
62	46113	52236	58690	60883	16312	18714	21218	22128
63	49844	56463	63439	65810	17633	20229	22936	23919
64	48541	54987	61781	64090	17172	19700	22337	23295
65	41726	47267	53107	55092	14761	16934	19201	20024
66	15437	17305	19236	19863	5651	6738	7940	8421
67	46410	52573	59069	61276	16418	18835	21356	22271
68	54472	61064	67879	70092	19930	23746	27962	29646
69	38360	43002	47801	49359	14042	16742	19730	20925
70	40754	45686	50785	52440	14918	17788	20962	22232
71	39027	44209	49671	51528	14184	16912	19929	21137
72	34010	38125	42380	43761	12449	14843	17492	18552
73	34907	39130	43497	44915	12778	15235	17954	19042

Zone	POPULATION				EMPLOYMENT			
	2031	2041	2051	2055	2031	2041	2051	2055
74	33940	38047	42294	43672	12424	14814	17457	18514
75	33597	37664	41867	43231	12299	14665	17281	18328
76	43887	49198	54688	56470	16066	19155	22573	23940
77	34201	38340	42618	44006	12519	14928	17591	18657
78	34690	38889	43228	44637	12691	15121	17806	18879
79	45756	51292	57016	58874	16749	19970	23533	24959
80	49842	56461	63437	65808	17633	20229	22936	23919
81	58588	66367	74567	77354	20726	23776	26959	28115
82	63298	71703	80562	83573	22394	25690	29129	30377
83	39436	44208	49141	50743	14435	17212	20283	21512
84	29216	32751	36406	37592	10695	12751	15027	15937
85	35924	40271	44765	46224	13143	15659	18440	19551
86	33241	37265	41423	42773	12168	14509	17098	18134
87	38786	43480	48332	49907	14190	16907	19908	21108
88	40953	45910	51033	52696	14984	17852	21022	22288
89	45321	50805	56475	58315	16581	19755	23263	24664
90	45358	51381	57729	59886	16046	18409	20873	21768
91	72739	82398	92578	96038	25732	29520	33471	34906
92	17940	20322	22833	23686	6346	7281	8255	8609
93	23843	27009	30346	31480	8435	9677	10972	11442
94	10742	12169	13672	14183	3801	4360	4944	5156
95	9214	10438	11728	12166	3261	3740	4241	4423
96	18637	21112	23720	24606	6592	7563	8575	8942
97	10775	12206	13714	14227	3812	4373	4958	5171
98	17344	19647	22074	22899	6135	7038	7980	8322
99	13288	15053	16913	17546	4701	5393	6114	6377
100	41689	47225	53059	55042	14748	16919	19183	20006
101	8985	10178	11436	11863	3179	3647	4135	4312
102	9697	10984	12341	12802	3430	3935	4462	4653
103	9612	10888	12233	12690	3399	3900	4422	4612
104	7633	8647	9716	10079	2701	3099	3513	3664
105	7922	8973	10081	10458	2802	3215	3645	3801
106	11927	13510	15179	15747	4220	4841	5489	5724
107	8474	9600	10786	11189	2999	3440	3900	4067
108	15093	17097	19209	19927	5339	6125	6945	7242
109	7721	8746	9827	10194	2731	3133	3553	3705
110	3689	4179	4695	4870	1305	1497	1698	1771
111	6648	7531	8461	8777	2352	2698	3059	3190

Zone	POPULATION				EMPLOYMENT			
	2031	2041	2051	2055	2031	2041	2051	2055
112	5526	6260	7033	7296	1955	2243	2543	2652
113	4711	5337	5996	6220	1666	1911	2167	2260
114	7465	8456	9501	9856	2640	3029	3434	3581
115	17569	19902	22361	23196	6215	7130	8085	8431
116	6882	7796	8759	9087	2434	2792	3166	3302
117	9476	10734	12060	12511	3353	3846	4361	4548
118	16048	18180	20426	21189	5676	6512	7384	7701
119	8622	9767	10974	11384	3050	3499	3967	4137
120	4503	5101	5731	5945	1593	1828	2073	2161
121	9288	10521	11821	12263	3286	3770	4275	4458
122	11199	12686	14253	14786	3962	4545	5154	5376
123	15063	17063	19171	19888	5328	6113	6931	7228
124	8245	9340	10494	10886	2917	3346	3794	3956
125	15242	22499	26924	29297	5590	9062	10981	11762
126	16149	23839	28527	31043	5921	9601	11634	12461
127	10544	15565	18627	20269	3867	6268	7596	8137
128	20848	30774	36827	40074	7646	12396	15021	16090
129	30670	45272	54177	58953	11247	18234	22097	23669
130	17990	20379	22897	23753	6364	7301	8278	8633
131	11122	12599	14155	14684	3935	4514	5118	5337
132	9783	11081	12450	12916	3460	3970	4501	4694
133	21596	24464	27487	28514	7640	8765	9937	10363
134	18133	20540	23078	23940	6415	7360	8345	8702
135	11448	12968	14571	15116	4050	4647	5268	5494
136	21534	31786	38038	41392	7896	12802	15514	16618
137	12275	13905	15622	16206	4342	4982	5648	5890
138	5743	6506	7309	7582	2031	2330	2642	2755
139	12631	14308	16077	16677	4468	5126	5812	6061
140	7632	8646	9714	10077	2700	3097	3511	3662
141	50017	56658	63659	66038	17695	20300	23017	24003
142	7310	8281	9303	9651	2587	2967	3363	3508
143	13373	15149	17022	17658	4731	5427	6154	6417
144	12956	14677	16490	17106	4584	5259	5962	6218
145	16940	19190	21560	22366	5993	6875	7795	8129
146	7628	8642	9710	10072	2699	3096	3510	3661
147	13943	15794	17746	18408	4932	5659	6416	6691
148	9601	10876	12219	12677	3396	3896	4417	4607
149	11197	16528	19778	21521	4105	6655	8065	8639

Zone	POPULATION				EMPLOYMENT			
	2031	2041	2051	2055	2031	2041	2051	2055
150	15161	17174	19296	20016	5364	6153	6976	7275
151	8329	9435	10601	10997	2947	3381	3833	3997
152	14266	16161	18157	18835	5047	5790	6565	6846
153	26410	29917	33614	34870	9343	10717	12152	12673
154	12300	13933	15655	16240	4352	4992	5660	5902
155	10098	11439	12853	13333	3572	4099	4647	4847
156	12309	13943	15666	16251	4355	4996	5665	5908
157	13381	15158	17031	17667	4733	5429	6156	6420
158	21296	24124	27105	28118	7534	8643	9800	10220
159	17325	19626	22051	22875	6130	7032	7973	8315
160	46707	52909	59447	61669	16524	18956	21494	22415
161	11961	13549	15224	15793	4232	4855	5505	5741
162	25440	28818	32379	33589	9000	10325	11707	12209
163	22858	25892	29092	30180	8086	9276	10518	10968
164	8751	9914	11139	11555	3097	3553	4028	4200
165	99182	112351	126233	130951	35087	40252	45639	47596
166	14702	16654	18712	19411	5201	5966	6765	7055
167	23254	26342	29597	30703	8226	9436	10700	11158
168	17594	25971	31079	33819	6453	10460	12675	13578
169	16059	18192	20439	21203	5681	6517	7390	7707
170	13833	15670	17606	18264	4894	5614	6365	6638
171	15218	17239	19369	20094	5384	6176	7003	7303
172	19052	21581	24248	25154	6739	7731	8766	9142
173	8948	10136	11388	11813	3165	3631	4117	4293
174	6820	7725	8679	9004	2413	2768	3138	3272
175	5777	6545	7354	7628	2044	2345	2658	2772
176	12267	13896	15613	16196	4340	4980	5646	5887
177	12727	14417	16198	16803	4502	5165	5857	6108
178	21598	24466	27489	28516	7641	8766	9939	10365
179	21730	24615	27656	28689	7686	8818	9998	10427
180	15072	17073	19183	19900	5331	6116	6935	7233
181	9336	10575	11882	12326	3303	3790	4297	4481
182	22097	25030	28123	29174	7817	8968	10168	10604
183	8801	9970	11202	11620	3113	3572	4050	4223
184	6541	7409	8325	8637	2314	2655	3010	3139
185	7277	8243	9262	9608	2574	2953	3348	3492
186	18840	21342	23979	24875	6666	7647	8671	9042
187	14990	16980	19079	19792	5303	6083	6897	7193

Zone	POPULATION				EMPLOYMENT			
	2031	2041	2051	2055	2031	2041	2051	2055
188	21038	23832	26777	27777	7443	8539	9682	10097
189	22852	25886	29085	30172	8085	9275	10517	10967
190	37477	42453	47698	49480	13258	15210	17245	17985
Total	**6708657**	**8398605**	**9675936**	**10242936**	**2418914**	**3206910**	**3769688**	**3990727**

FIGURE 3.11 shows the public transport routes considered in the study and accordingly coded in VISUM for transport demand forecast. The modal share for Urban Structure scenario in Year 2055 as derived from transport demand model is presented in **TABLE 3.17**.

FIGURE 3.11: PUBLIC TRANSPORT ROUTES IN URBAN STRUCTURE SCENARIO (YEAR 2055)

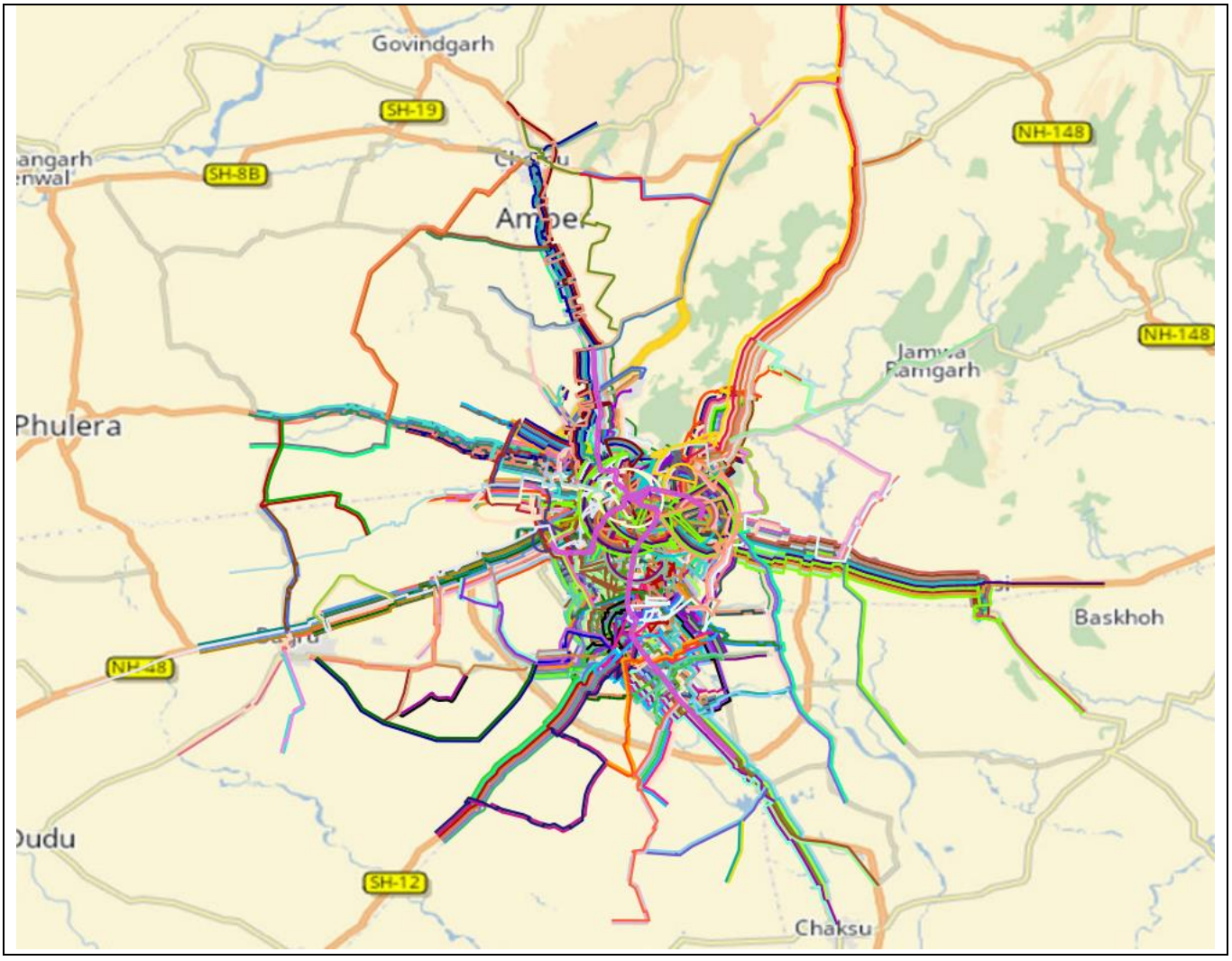


TABLE 3.17: MODAL SHARE IN URBAN STRUCTURE SCENARIO - 2055

Mode	Daily Trips	Modal Share (%)
Car	1715716	10.8%
2W	5792135	36.5%
Auto Rickshaw	2524690	15.9%
PT incl. Sh. Auto, E-Rickshaw, Bus, MRTS	2340444	14.7%
Cycle	403151	2.5%
Walk	3102924	19.5%
Total	15879060	100.0%

It can be seen that the modal share in favor of public transport has increased from 14% in BAU scenario to 14.7% under UT Scenario. Also, the modal share of cars and 2-wheeler is lower in Urban Structure scenario at 10.8% and 36.5%.

B. PUBLIC TRANSPORT SCENARIO

With urban expansion and increasing economic prosperity, there is an increase in vehicle ownership and in the absence of safe and reliable public transport people are forced to use private vehicles for their travel needs. Public transport can serve to mitigate the economic and environmental burden that increased vehicle ownership has imposed on the city or population. This improvement goes beyond infrastructure development to include better accessibility, integration with land use, and non-motorized transport (NMT) infrastructure.

In this scenario, public transport infrastructure is envisioned to be upgraded through the introduction of Mass Rapid Transit System (MRTS) along major travel corridors, offering enhanced comfort and safety compared to existing modes. Low-capacity transport modes will be deployed on arterial and minor roads with limited right-of-way. Improved scheduling, increased network coverage, and enhanced safety and comfort for users are central to this scenario.

Existing shared autos will be the competing modes which may impact the ridership of MRTS. Therefore, the operation of shared autos is planned to operate as a feeder to MRTS routes. In addition to the improved service, rail-based mass rapid transit system on selected high demand corridors is considered in this scenario. All these improvements are factored into the transport demand model for the horizon year of 2054.

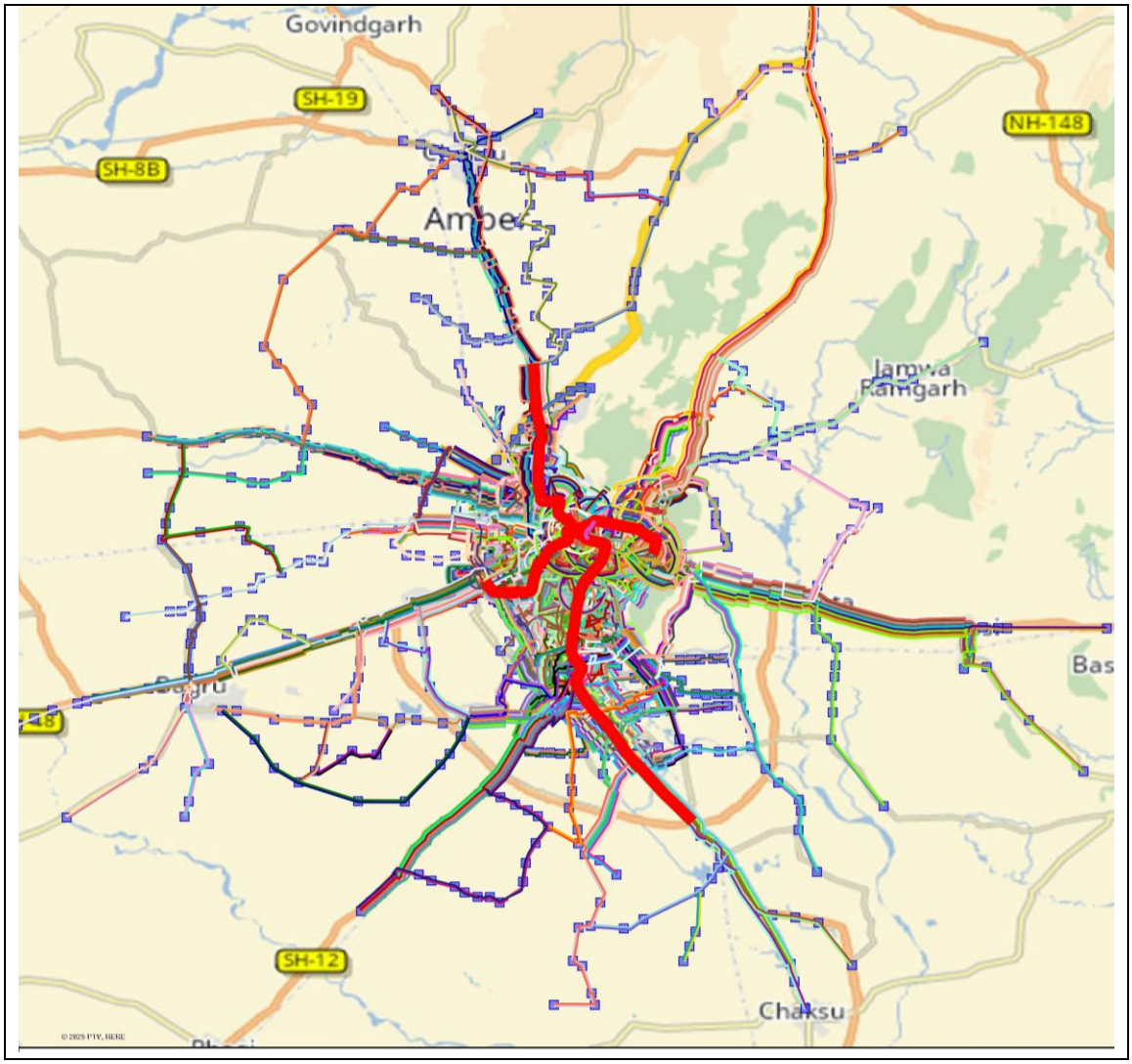
The Urban Structure scenario's growth patterns, modulated to increase public transport accessibility, serve as the baseline for this iterative analysis. The goal is to encourage a modal shift from private vehicles to public transport. This scenario expects a significant shift from two-wheeler use to public transport, with minimal changes in the modal share of cycling and walking compared to the Urban Structure scenario.

By improving and expanding infrastructure, accessibility to public transit, and integrating land use, changed mode choice have been derived from the 4-stage travel demand model. The Urban Structure scenario growth patterns, which have been modulated as such to provide higher accessibility to public transport, are taken as the base and an iterative process of public transport development is considered for this analysis.

The public transport improvement scenario presents the analysis carried out to estimate the likely shift from cars, 2-wheeler, auto rickshaws to public transport. In this scenario, the availability and quality of public transport is increased incrementally and the likely shift it induces is observed.

The enhanced public transport routes considered in the Public Transport scenario are presented in **FIGURE 3.12**.

FIGURE 3.12: ENHANCED PUBLIC TRANSPORT NETWORK IN PUBLIC TRANSPORT SCENARIO (YEAR 2055)



With many public transport interventions, the modal share of public transport is expected to increase in this scenario. **TABLE 3.18** shows the aggregate modal share in Public Transport scenario as derived from the travel demand model.

TABLE 3.18: MODAL SHARE IN PUBLIC TRANSPORT SCENARIO - 2055

Mode	Daily Trips	Modal Share (%)
Car	1661727	10.5%
2W	5046003	31.8%
Auto Rickshaw	2483405	15.6%
PT incl. Sh. Auto, E-Rickshaw, Bus, MRTS	2921531	18.4%
Cycle	752491	4.7%
Walk	3013901	19.0%
Total	**15879060**	**100.0%**

It can be seen from the above table that the modal share in favor of cars, 2-wheeler and auto has been decreased from 10.8%, 36.5% and 15.9% under Urban Structure Scenario to 10.5%, 31.8% and 15.6% respectively. The modal share in favor of public transport has been increased from 14.7% to 18.4%.

Due to public transport interventions in this scenario, the trips from private vehicles, i.e.carsr, 2-wheelers and autos have been shifted to public transport. The major shift to public transport can be seen from 2 wheelers. **FIGURE 3.13** shows the link-wise peak hour public transport loads on the network under public transport scenario.

c. NON- MOTORIZED TRANSPORT SCENARIO

Non-Motorized Transport (NMT) modes are the cleanest modes and interventions for the infrastructure improvement of NMT modes are necessary for sustainable urban transport in the city. As such, this scenario is assumed to increase the modal share of walk and NMT in the city. This results in a high level of pedestrian vehicular conflict and high fatalities. Safe walking and cycling infrastructure is envisaged under this scenario for better safety and to promote walk and NMT as a preferred mode in the city in addition to the interventions considered under Urban Structure and Public Transport scenarios.

The assumed infrastructure under the NMT scenario will include continuous footpaths and cycle paths, good crossing facilities, parking for cyclists, signal prioritization, strong parking policies and strict enforcement to remove the hindrances on NMT infrastructures. The modal share derived from travel demand model is presented in **TABLE 3.19.**

FIGURE 3.13: PEAK HOUR PT ASSIGNMENT IN PUBLIC TRANSPORT SCENARIO (YEAR 2055)

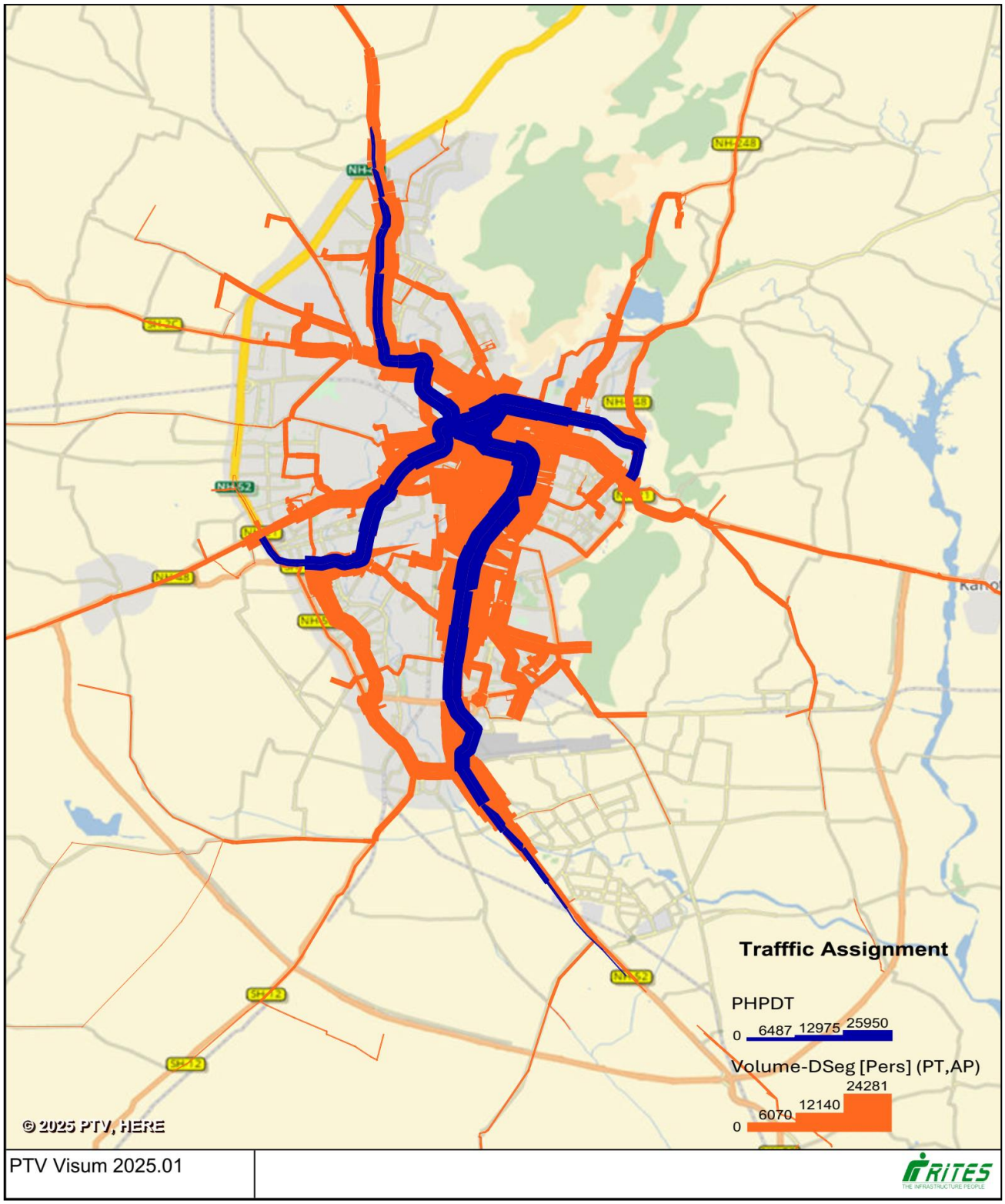


TABLE 3.19: MODAL SHARE IN NMT SCENARIO-2055

Mode	Daily Trips	Modal Share (%)
Car	1606147	10.1%
2W	4887210	30.8%
Auto Rickshaw	2483405	15.6%
PT incl. Sh. Auto, E-Rickshaw, Bus, MRTS	2840548	17.9%
Cycle	1000204	6.3%
Walk	3061546	19.3%
Total	15879060	100.0%

d. TECHNOLOGY TRANSITION

The Technology Transition scenario is envisaged in progression to the NMT scenario. Though under the NMT scenario, there is an increment in the share of NMT and walk trips, substantial share of trips will continue to be catered by motorized modes including public transport modes as bus and shared autos. As such, it is imperative to reduce consumption of conventional sources of energy for motorized modes. Fuel mix shares used as inputs to estimation of emissions of CO_2 and other pollutants for year 2055 based on Niti Aayog RMI Study May 2017 are summarized in **TABLE 3.20** and Fuel Consumption for various scenarios is given in **TABLE 3.21**.

In the modeling framework, the fuel mix for public transport (PT) has been adjusted in the Public Transport and Non-Motorised Transport (NMT) scenarios to reflect the increased emphasis on sustainable and shared mobility options, as compared to the Urban Structure scenario. These scenarios prioritize modal shift towards public transport, thereby necessitating a corresponding change in the fuel composition to support expanded and cleaner PT operations.

Furthermore, under the Technology Scenario, it is assumed that advancements in vehicle and fuel technologies by the year 2055 will lead to significant improvements in fuel efficiency across all modes. Hence, an increase in fuel efficiency has been incorporated into the scenario assumptions, reflecting the expected benefits of evolving transport technologies and cleaner propulsion systems.

TABLE 3.20: FUEL MIX SHARES (IN %)

TYPE OF FUEL	BASE YEAR	BAU (2055)	SUSTAINABLE TRANSPORT SCENARIOS (2055)			TECHNOLOGY SCENARIO (2055)
			URBAN STRUCTURE	PT	NMT	
2-WHEELER						
Petrol	81.88	81.88	40	40	40	20
Diesel	-	-	-	-	-	-
CNG	0.31	0.31	5	5	5	5
Electric	17.80	17.80	55	55	55	75
3-WHEELER						
Petrol	-	-	-	-	-	-
Diesel	3.85	3.85	-	-	-	-
CNG	29.71	29.71	30	30	30	10
Electric	66.44	66.44	70	70	70	90
4-WHEELER						
Petrol	43.80	43.80	30	30	30	10
Diesel	29.26	29.26	-	-	-	-
CNG	22.67	22.67	30	30	30	30
Electric	4.27	4.27	40	40	40	60
BUS						
Petrol	16.74	16.74	-	-	-	-
Diesel	26.82	26.82	-	-	-	-
CNG	55.76	55.76	40	30	30	-
Electric	0.68	0.68	60	70	70	100

TABLE 3.21: DAILY FUEL CONSUMPTION FOR VARIOUS SCENARIOS -2055

TYPE OF VEHICLE	DAILY FUEL CONSUMPTION			
	PETROL (L)	DIESEL (L)	GAS (KG)	ELECTRICITY (IN MWh)
URBAN STRUCTURE SCENARIO (2055)				
2-WHEELER	3,36,017	0	20,514	654.06
3-WHEELER	0	0	36,020	130.58
4-WHEELER	1,23,172	0	96,708	316.88
PT	0	0	26,21,297	20,562.88
PUBLIC TRANSPORT SCENARIO (2055)				
2-WHEELER	2,23,854	0	13,666	435.74
3-WHEELER	0	0	34,068	123.50
4-WHEELER	1,19,296	0	93,665	306.90
PT	0	0	25,56,340	38,995.44
NMT SCENARIO (2055)				
2-WHEELER	2,16,809	0	13,236	422.02
3-WHEELER	0	0	34,068	123.50
4-WHEELER	1,15,306	0	90,532	296.64
PT	0	0	24,85,480	37,914.50

TYPE OF VEHICLE	DAILY FUEL CONSUMPTION			
	PETROL (L)	DIESEL (L)	GAS (KG)	ELECTRICITY (IN MWh)
TECHNOLOGY SCENARIO (2055)				
2-WHEELER	90,337	0	11,030	551.51
3-WHEELER	0	0	9,463	152.17
4-WHEELER	32,030	0	75,444	426.42
PT	0	0	0	41,871.30

i. CO2 Emissions and Air Quality

Emissions of CO2 as well as other pollutants have been estimated using standard emission factors. CO2 emissions resulting from grid power generation required for rail-based mass transport operation have also been accounted for. Emissions from passenger vehicles under various scenarios are presented in TABLE 3.22 and TABLE 3.23 using the following:

- CO2 emissions from generation of grid power to operate electric vehicles as well as consumption of electric energy by electric vehicles adopted from industry trends
- CO2 emissions from generation of grid power to operate mass transport system.

TABLE 3.22: DAILY CO2 EMISSIONS FOR VARIOUS SCENARIOS – 2055

TYPE OF VEHICLE	DAILY CO_2 EMISSIONS (TONNES) IN YEAR 2055			
	PETROL	DIESEL	GAS	ELECTRICITY
URBAN STRUCTURE SCENARIO (2055)				
2-WHEELER	772.84	0	34.67	156.98
3-WHEELER	0	0	60.87	31.34
4-WHEELER	283.30	0	163.44	76.05
PT	0	0	44,29.99	4,935.09
PUBLIC TRANSPORT SCENARIO (2055)				
2-WHEELER	514.86	0	23.10	104.57
3-WHEELER	0	0	57.58	29.64
4-WHEELER	274.38	0	158.29	73.66
PT	0	0	4,320.22	9,358.91
NMT SCENARIO (2055)				
2-WHEELER	498.66	0	22.37	101.28
3-WHEELER	0	0	57.58	29.64
4-WHEELER	265.20	0	153.00	71.19
PT	0	0	4,200.46	9,099.48
TECHNOLOGY SCENARIO (2055)				
2-WHEELER	207.77	0	18.64	132.36
3-WHEELER	0	0	15.99	36.52
4-WHEELER	73.67	0	127.50	102.34
PT	0	0	0	10,049.11

The CO_2 emission profile by vehicle type and fuel shows clear differences across scenarios. Urban Structure Scenario shows the highest emissions from public transport (PT) running on gas (4,429.99 tonnes/day) and considerable electricity-based emissions (4,935.09 tonnes/day), reflecting a partially transitioned fleet with limited technological upgrade.

The Public Transport Scenario results in the highest bus emissions—over 14,500 tonnes combined from CNG and electric buses—due to increased reliance on mass transit, even as emissions from 2-wheelers and 4-wheelers slightly decline.

The NMT Scenario maintains a similar emissions pattern to the Public Transport Scenario, but with modest reductions across all vehicle types due to increased use of non-motorized modes.

The Technology Scenario demonstrates the most substantial reduction in overall emissions, particularly by replacing diesel and gas usage with cleaner electric alternatives. Bus emissions in this case come entirely from electricity (10,049 tonnes), with near-zero emissions from petrol or gas.

TABLE 3.23: DAILY EMISSIONS OF OTHER POLLUTANTS FOR VARIOUS SCENARIOS (2055)

TYPE OF VEHICLE	DAILY EMISSIONS (KG) FOR VARIOUS SCENARIOS IN YEAR 2055											
	URBAN STRUCTURE SCENARIO			PT SCENARIO			NMT SCENARIO			TECHNOLOGY SCENARIO		
	PETROL	DIESEL	GAS	PETROL	DIESEL	GAS	PETROL	DIESEL	GAS	PETROL	DIESEL	GAS
PM 2.5												
2-WHEELER	164.11	0.00	8.21	109.33	0.00	5.47	105.89	0.00	5.29	52.94	0.00	5.29
3-WHEELER	0.00	0.00	11.58	0.00	0.00	10.96	0.00	0.00	10.96	0.00	0.00	3.65
4-WHEELER	18.23	0.00	9.11	17.66	0.00	8.83	17.07	0.00	8.53	5.69	0.00	8.53
Bus	0.00	0.00	786.39	0.00	0.00	1168.61	0.00	0.00	1136.22	0.00	0.00	0.00
NOx												
2-WHEELER	2461.66	0.00	61.54	1639.95	0.00	41.00	1588.34	0.00	39.71	794.17	0.00	39.71
3-WHEELER	0.00	0.00	115.84	0.00	0.00	109.56	0.00	0.00	109.56	0.00	0.00	36.52
4-WHEELER	182.29	0.00	91.15	176.56	0.00	88.28	170.65	0.00	85.33	56.88	0.00	85.33
Bus	0.00	0.00	34404.53	0.00	0.00	51126.80	0.00	0.00	49709.60	0.00	0.00	0.00
CO												
2-WHEELER	16411.05	0.00	1025.69	10933.01	0.00	683.31	10588.96	0.00	661.81	5294.48	0.00	661.81
3-WHEELER	0.00	0.00	1158.39	0.00	0.00	1095.62	0.00	0.00	1095.62	0.00	0.00	365.21
4-WHEELER	1093.77	0.00	1822.95	1059.35	0.00	1765.58	1023.92	0.00	1706.53	341.31	0.00	1706.53
Bus	0.00	0.00	24574.66	0.00	0.00	36519.15	0.00	0.00	35506.86	0.00	0.00	0.00
VOC												
2-WHEELER	9846.63	0.00	615.41	6559.81	0.00	409.99	6353.38	0.00	397.09	3176.69	0.00	397.09

TYPE OF VEHICLE	DAILY EMISSIONS (KG) FOR VARIOUS SCENARIOS IN YEAR 2055											
	URBAN STRUCTURE SCENARIO			PT SCENARIO			NMT SCENARIO			TECHNOLOGY SCENARIO		
	PETROL	DIESEL	GAS	PETROL	DIESEL	GAS	PETROL	DIESEL	GAS	PETROL	DIESEL	GAS
3-WHEELER	0.00	0.00	695.03	0.00	0.00	657.37	0.00	0.00	657.37	0.00	0.00	219.12
4-WHEELER	1093.77	0.00	729.18	1059.35	0.00	706.23	1023.92	0.00	682.61	341.31	0.00	682.61
Bus	0.00	0.00	11795.84	0.00	0.00	17529.19	0.00	0.00	17043.29	0.00	0.00	0.00

Emissions of key air pollutants—PM2.5, NOx, CO, and VOCs—vary significantly across the 2055 scenarios, driven by fuel type, mode share, and technology uptake. The Public Transport and NMT scenarios exhibit higher emissions from CNG buses, especially for NOx (over 51,000 kg/day in PT scenario) and PM2.5, due to their expanded role. Two-wheelers remain major contributors to CO and VOCs, though emissions fall sharply in the Technology Scenario with partial electrification (e.g., CO from 2Ws drops from 16,411 kg in Urban Structure to 5,294 kg in Technology). Emissions from 3-wheelers and 4-wheelers remain moderate but consistent across scenarios, with limited reductions in gas-based pollutants unless fully electrified.

The Technology Scenario demonstrates the lowest emissions across all pollutants, particularly eliminating bus-related emissions entirely, highlighting that electrification is crucial for reducing urban air pollution. In contrast, while mode shift helps moderate emissions, its effectiveness is limited unless combined with clean fuel technologies.

3.2.3. COMPARATIVE ANALYSIS OF SCENARIOS

On the basis of above analysis, a comparative picture has been drawn to assess the impact each scenario has on the travel pattern and environment. The following parameters have been taken into account for preparing a comparative picture among various scenarios:

- **Modal Share:** Change in share of various modes, with increase in share of Public Transport and NMT modes and decrease in modal share of private modes indicates a sustainable future.

- **Trip Length:** Shorter trip lengths indicate shorter time spent in commuting between two places whereas increase in trip length of a particular mode indicates preference to that particular mode due to availability of allied infrastructure.

- **Veh-km:** Vehicle km travelled by each mode is the most tangible indicator for comparing scenarios. For example, a scenario with highest vehicle km travelled by 2-wheeler/4-wheeler in comparison to other scenarios indicates an unsustainable future.

CO_2 Emissions: The CO_2 emission is derived from all above parameters and is a good indicator of environment impact of all the scenarios. **Table 3.24** presents the comparative picture for various scenarios.

TABLE 3.24: COMPARATIVE ANALYSIS BETWEEN DIFFERENT SCENARIOS (2055)

Scenario		Base Year	BAU	Urban Structure Scenario	Public Transport Scenario	NMT Scenario	Technology Scenario
Horizon Year		**2024**	**2055**	**2055**	**2055**	**2055**	**2055**
Population		**5586179**	**10131463**	**10242936**	**10242936**	**10242936**	**10242936**
Total Trips		8351560	15567705	15879060	15879060	15879060	15879060
PCTR (Total)		1.5	1.5	1.6	1.6	1.6	1.6
PCTR (Motorised)		1.2	1.2	1.2	1.2	1.2	1.2
Modal Share (%)	**Car**	11.4%	12.1%	10.8%	10.5%	10.1%	10.1%
	2W	34.1%	36.9%	36.5%	31.8%	30.8%	30.8%
	Auto Rickshaw	16.4%	15.1%	15.9%	15.6%	15.6%	15.6%
	PT incl. Sh. Auto, E-Rickshaw, Bus, MRTS	15.2%	14.0%	14.7%	18.4%	17.9%	17.9%
	Cycle	2.7%	2.5%	2.5%	4.7%	6.3%	6.3%
	Walk	20.2%	19.4%	19.6%	19.0%	19.3%	19.3%
Trip Length (Km)	**Car**	10.7	11.0	8.5	8.5	8.5	8.5
	2W	8.1	8.5	8.5	6.5	6.5	6.5
	Pvt. Auto	5.3	5.5	5.2	5.0	5.0	5.0
	PT incl. Sh. Auto, E-Rickshaw, Bus, E-Bus/CNG Bus, MRTS	7.1	9.5	10.5	12.5	12.5	12.5
	Cycle	1.6	2.0	2.0	2.1	2.5	2.5
Veh-km Travelled	**Car**	4252179	8637072	6076485	5885275	5688441	5688441
	2W	19305514	40664244	41027625	27332521	26472406	26472406
	Pvt. Auto	2147071	3811550	3861292	3652066	3652066	3652066
	Cycle	336872	718630	733003	1436574	2273192	2273192
Pax-km Travelled	**PT incl. Sh. Auto, E-Rickshaw, Bus, E-Bus/CNG Bus, MRTS**	9062972	20674263	24574662	36519145	35506855	35506855
CO_2 Emissions Per Day ('000 Kg)		**7,052**	**15,768**	**10,945**	**14,915**	**14,499**	**10,764**

It is seen that CO_2 emissions are likely to decrease from 15,768 tons in BAU scenario to 10,945 tons in Urban Structure scenario; other pollutants are also likely to decrease in Urban Structure scenario. Technological scenario has more benefits of reducing CO_2 from 15,768 tons to 10,764 tons compared to Urban Structure and BAU scenario and benefit in reduction of emissions from other pollutants.

Reduction of other pollutants during PT, NMT and Technology scenarios has been envisaged by projecting diversification of fuel from existing petrol and diesel to

electricity. The improvement in technology has been assumed by the year 2055 such as the vehicle efficiency in terms of engine output / unit of fuel is considerably higher than that in the present scenario.

The figures in the above table indicate the differences between various scenarios as follows:

- **Modal Share:**

The modal share projections for 2055 vary notably across scenarios. Under the BAU scenario, private vehicle usage rises, with two-wheelers reaching 36.9% and cars 12.1%, while public transport share declines to 14.0%, indicating limited improvement in sustainable mobility. The Urban Structure Scenario shows marginal shifts, with car use reducing to 10.8% and public transport slightly improving to 14.7%, but two-wheeler dependence remains high.

The Public Transport Scenario achieves the highest PT share at 18.4%, reflecting strong modal shift from private vehicles, supported by a drop in car (10.5%) and 2W (31.8%) usage. The NMT Scenario sees a peak in cycling (6.3%) and sustained walking (19.3%), while car and 2W use fall to 10.1% and 30.8%, respectively—indicating effective promotion of active mobility.

The Technology Scenario retains the same modal shares as the NMT scenario but emphasizes cleaner vehicle technologies. Overall, the Public Transport and NMT scenarios show the most promising modal shifts towards sustainable and low-emission mobility.

- **Trip Length:**

Trip length trends across scenarios reflect the combined impact of urban form, transport mode choice, and infrastructure. In the BAU scenario, average trip lengths increased compared to the base year, with car trips rising to 11.0 km and PT trips to 9.5 km, suggesting urban sprawl and dispersed development. The Urban Structure Scenario reduces car and 2W trip lengths to 8.5 km and 6.5 km respectively, indicating the benefits of compact urban planning. In the Public Transport, NMT, and Technology Scenarios, trip lengths for PT extend further to 12.5 km—signifying improved regional connectivity—while private vehicle and 2W trip lengths remain controlled (car: 8.5 km, 2W: 6.5 km). Cycle trip lengths increase slightly to 2.5 km in the NMT and Technology scenarios, reflecting improved cycling infrastructure and last-mile connectivity.

Overall, these shifts highlight that urban structure and transport investments can effectively reduce trip lengths for private modes while enabling longer, efficient trips through public transport.

- **Veh-km:**

  Vehicle kilometers travelled (VKT) indicate overall traffic volumes and are closely aligned with modal shares and trip lengths. In the BAU scenario, VKT for cars and two-wheelers peak at 8.6 million and 40.7 million km/day respectively, driven by high private vehicle usage and longer trip distances. The Urban Structure Scenario moderately reduces car VKT to 6.1 million km/day, reflecting more compact land use. The most significant reductions are observed in the Public Transport and NMT Scenarios, where two-wheeler VKT drops to ~26.5 million km/day and car VKT to ~5.7 million km/day, indicating successful modal shift. Across all future scenarios, public transport passenger-kilometers increase substantially, peaking at 36.5 million km/day in the Public Transport Scenario.

  These patterns highlight the potential of integrated planning and investment in mass transit to significantly reduce total vehicle travel, easing congestion and improving environmental outcomes.

- **CO_2 Emissions per Day:**

  CO_2 emissions per day rise sharply under the BAU scenario, reaching 15,768.44 tonnes, more than double the base year level (7,051.85 tonnes). This increase is driven by greater reliance on private motorized vehicles and longer travel distances. The Urban Structure Scenario brings emissions down to 10944.56 tonnes/day, showing the benefits of compact city development. However, the Public Transport Scenario, improves mode share, sees the emissions (14915.20 tonnes/day). Similarly, the NMT Scenario slightly improves the situation over PT scenario (14498.87 tonnes/day) with greater active transport share. The most effective reduction occurs in the Technology Scenario, where the use of cleaner fuels and improved vehicle technologies, fuel efficiencies and lowers emissions to 10763.91 tonnes/day. This highlights that while modal shift is important, technology adoption plays a critical role in reducing transport-sector emissions, especially in high-demand future scenarios.

3.3. RECOMMENDED SCENARIO

As evident from the above analysis, the city benefits from NMT Scenario in terms of increase in Modal Share, Trip Length and veh-km for NMT modes. However, considering improvement in the environment, the Technology Scenario is the most suitable scenario for the city as it includes the following benefits:

- Development of compact city
- Shorter trip lengths and improved access to public transport
- Reliable, comfortable and safe public transport

- Increase in modal share of walk and NMT
- Considerably lower emissions from all the other scenarios

As such, the Technology Scenario is recommended for the next stage i.e. the Proposal Formulation and Implementation Plan.

CHAPTER – 4
DEVELOPMENT OF COMPREHENSIVE MOBILITY PLAN

4. DEVELOPMENT OF COMPREHENSIVE MOBILITY PLAN

4.1. INTEGRATED LAND USE AND URBAN MOBILITY PLAN

Urban transport is a derived demand that is intrinsically shaped by land use patterns, while the presence and quality of transport infrastructure simultaneously influence urban development. The integration of land use and transportation systems is fundamental to achieving sustainable urban growth. As outlined in the National Urban Transport Policy (NUTP), 2014, it is essential that transport and land use planning be undertaken concurrently, ensuring inclusivity while reducing the need for travel.

An integrated master plan must embed the principles of sustainable urban transport from the outset. This entails guiding a city's future expansion around a strategically designed transport network, rather than reacting to unplanned urban sprawl. In alignment with this approach, the present study proposes the formulation of an Integrated Land Use and Urban Mobility Plan to support holistic and future-ready urban development.

4.1.1. Recommended Urban Structure

The Jaipur Master Plan – 2025 outlines a land use strategy that distributes commercial activities across various zones, including the city's core. However, this decentralized approach is likely to promote increased reliance on motorized transportation, resulting in higher emissions and a greater carbon footprint. To address these concerns, the present study recommends a shift towards intensive urban development along key travel demand corridors. This strategy would enable the implementation of high-capacity public transport systems, ensuring efficient passenger movement while supporting environmentally sustainable growth.

a) Recommended FAR

The Government of Rajasthan has notified the Transit Oriented Development (TOD) Policy 2025 to promote compact, mixed-use, and transit-supportive urban development along major public transport corridors.

The policy prescribes mixed-use distribution and development intensity through defined Built-up Area Ratio (BAR) in place of FAR norms based on existing land use and scheme category. A balanced mix of residential, commercial, and public/semi-public uses is ensured, while retaining minimum proportions of the original land use. The required mix may be achieved either horizontally across plots or vertically within buildings, subject to compatibility and safety considerations. BAR for a TOD scheme is

calculated as the aggregate of BAR entitlements of all constituent plots. For both Category-1 and Category-2 schemes, the base BAR is as per prevailing Building Bye-laws, with an enhanced TOD BAR of up to 3.0, subject to a minimum ROW of 12 m. Building height is regulated in relation to ROW and front setback, capped at 1.75 times the ROW plus front setback, while maximum ground coverage is limited to 50% for schemes up to 1 ha and 45% for schemes above 1 ha. Additional purchasable BAR beyond 3.0 is permitted on payment of a betterment levy, varying by land use and BAR slab, enabling value capture from intensified development.

4.1.2. Components of Proposed CMP

a) Short Term (0-5 Years) - Traffic Engineering & Management Measures

Traffic engineering and management interventions have been finalized based on the identified mobility challenges and are included in this report. The proposed schemes include the following key measures:

- Junction Improvements: Geometric enhancements to facilitate efficient turning movements, including the provision of channelisers and traffic islands.
- Corridor Upgrades: Traffic circulation improvements along major corridors, including strengthening and redesigning footpaths for pedestrian safety and convenience.
- Non – Motorised Transport (NMT) Facilities: Development of dedicated infrastructure for pedestrians and cyclists to promote safe, sustainable, and inclusive mobility.
- Multilevel Parking Facilities: Provision of structured parking solutions at high-demand locations to reduce on-street parking and improve overall traffic flow.

b) Medium (5 – 10 years) & Long Term (more than 10 years)

Based on projected travel demand up to the year 2055, a comprehensive and integrated transport system has been proposed for Jaipur and its connectivity with adjoining towns and satellite settlements. The plan aims to provide safe, efficient, inclusive, and sustainable mobility solutions for all user groups. The proposed interventions include:

- Public Transport Improvement Plan
  i. Mass Rapid Transit (MRT) Expansion
     - Development of new metro rail corridors and phased expansion of existing metro lines based on projected demand.
  ii. Transit-Oriented Development (TOD)
     - Implementation of TOD policies around metro and high-capacity transit nodes to encourage compact, mixed-use development and reduce trip lengths.

iii. City Bus System
- Expansion and rationalization of city bus services, including high-frequency trunk and feeder routes
- Development of bus depots at nodal locations with electric bus charging infrastructure

iv. Passenger Terminals
- Modern inter-city bus terminals with upgraded facilities
- Designated IPT stands (auto/e-rickshaw/tempo) near major public transport hubs for seamless transfers

- Road Network Development Plan
  i. Road Widening & Standard Cross-Sections
     - Widening of key arterial and sub-arterial roads with uniform carriageways, service roads, NMT lanes, and drainage
  ii. New Road Infrastructure
     - Development of Outer Ring Road, elevated corridors, city bypasses, and connectivity to industrial zones
     - Construction of grade separators, flyovers at critical choke points
  iii. Rail Over/Under Bridges (ROB/RUB)
     - New ROBs/RUBs at high-conflict locations in coordination with Railways
- Non – Motorized Transport (NMT) Improvement Plan
  i. Footpaths & Cycle Tracks
     - Safe and continuous walkways and segregated cycle lanes along major corridors
- Traffic Management Measures
  i. Parking Management
     - Off-street and multi-level parking at demand hotspots
  ii. Junction Improvements & One-Way Systems
     - Redesign of major intersections with channelisation, signage, and signal optimization
- Inter-modal Integration
  i. Development of multimodal transport hubs integrating Metro, city buses, IPT, and cycle sharing
  ii. Provision of pedestrian skywalks/subways and unified ticketing systems
- Integrated Freight Terminals
  i. Integrated Freight Terminals
     - Development of Logistic parks for efficient goods consolidation and last-mile movement
  ii. Freight Traffic Management
     - Designated time windows and routes for heavy commercial vehicles to reduce congestion in the city core

- Intelligent Transport System
  i. Real-time bus tracking, passenger information systems, traffic signal coordination, and incident response integration through a central command centre
  ii. Smart mobility apps, digital signage, and adaptive traffic control systems
- Regulatory, Institutional & Fiscal Measures
  i. Formation of Unified Metropolitan Transport Authority (UMTA) for coordinated planning and implementation
  ii. Establishment of Traffic Engineering Cells (TECs)
  iii. Fiscal Measures: Congestion pricing pilots, increased parking fees in core areas, and incentives for electric mobility adoption
- Stakeholder Engagement & Communication

4.2. PUBLIC TRANSPORT IMPROVEMENT PLAN

The public transportation system is planned on a combination of high-capacity trunk and medium-capacity corridors. The balance network is proposed for low-capacity feeder systems operations.

The high-capacity trunk corridors are primarily envisioned to be served by Mass Rapid Transit System, which is suitable for corridors with high passenger demand, adequate Right of Way (ROW), and dense land-use patterns. The selection of these trunk corridors depend mainly on the expected public transport demand and the availability of ROW. Other considerations are the land-use along the corridor, the location of building lines, and the potential for increasing the ROW.

Using the same principle, mass rapid transit system has been proposed on high-capacity trunk corridors while Bus/Intermediate Public Transport (IPT) system has been proposed on other medium to low capacity corridors. The description of same has been given in subsequent sections.

4.2.1. Proposed Mass Rapid Transit System (MRTS) Corridors

Considering the public transport demand for the horizon period of 30 years, the master plan for Mass Rapid Transit System has been proposed for the next 30 years. The Phase 1 MRTS corridor is already operational. The MRTS corridors have been proposed to be implemented in three phases as follows:

- **Phase 2**: One MRTS corridor has been proposed from Prahladpura to Todi Mod including Spur from Govt. Hostel to Chandpole with total length of 42.8 Km. Phase 2 corridor is proposed to be implemented upto 2031.
- **Phase 3**: Three MRTS corridors have been proposed in Phase 3. Phase 3A corridor is proposed from Transport Nagar – Balaji Mod – Jagatpura (which shall be extension of Phase 1-C) with total length of 17.0 Km. Phase 3B corridor is proposed from Ajmer Road Chauraha – Kalwar Road (which shall be extension

of Phase-1D) with total length of 8.5 Km. Phase 3C corridor is proposed from Kanakpura – Civil Lines – Ram Bagh – Jhalana Dungri with total length of 16.3 Km. Phase 3D corridor is proposed from ISBT Heerapura - Mansarovar – Balaji Mod with total length of 16.0 Km. Phase 3 corridors with total network of 57.8 km are proposed to be implemented upto 2041.

- **Phase 4:** Three MRTS corridors have been proposed in Phase 4. Phase 4A corridor is proposed from Jagatpura Rly Stn – Khatipura Rly. Stn. Spur with total length of 6.5 Km. Phase 4B corridor is proposed from Galta Ji – Jal Mahal - Amer with total length of 9.5 Km. Phase 4C corridor is proposed from Transport Nagar – Bagrana (which is extension of Phase-1C) with total length of 10.4 Km. Phase 4D corridor is proposed from Kalwar Road – Laxmi Narayanpura (which is extension of Phase-3B) with total length of 11.1 Km. Phase 4 corridors with total network of 37.5 km are proposed to be implemented upto 2055.

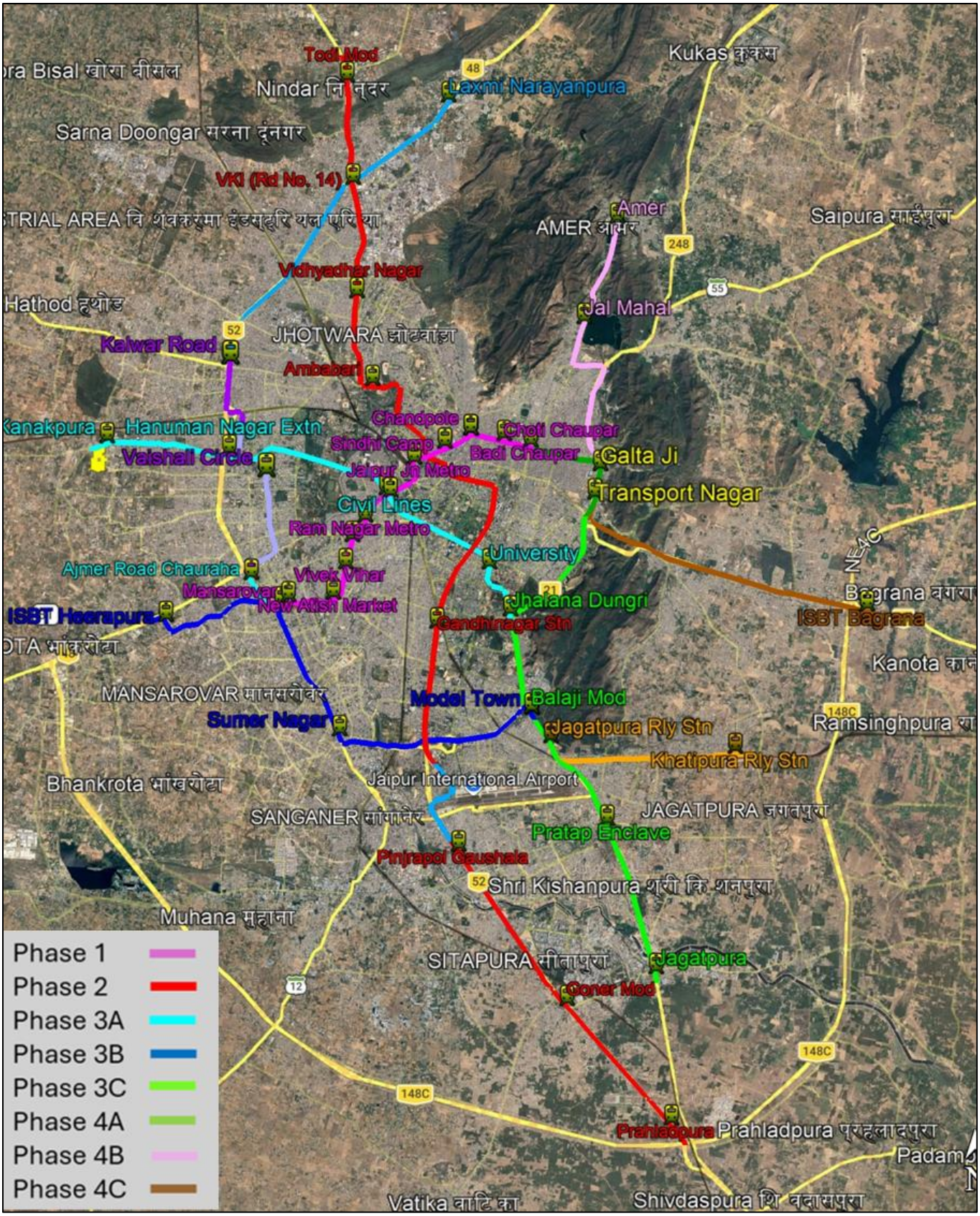
The total length of proposed MRTS corridors in all the phases (2,3 & 4) is about 113 Km. A feasibility study considering the capacity, geometric constraints, capital & operating costs, alternative analysis etc. would determine the final alignment and technology of the corridor.

The details of proposed MRTS corridors are presented in **TABLE 4.1** and FIGURE 4.1.

TABLE 4.1 DETAILS OF PROPOSED MRTS CORRIDORS IN JAIPUR

MRTS CORRIDORS	LENGTH (KM)	MAXIMUM PHPDT (2055)
Phase 2: Prahladpura - Todi Mod including Spur from Govt. Hostel to Chandpole (2031)	42.8	24,860
Phase 3A: Transport Nagar – Balaji Mod – Jagatpura (Extension of Phase-1C)	17.0	9,800
Phase 3B: Ajmer Road Chauraha – Kalwar Road (Extension of Phase-1D)	8.5	10,500
Phase 3C: Kanakpura – Civil Lines – Ram Bagh – Jhalana Dungri	16.3	9,150
Phase 3D: ISBT Heerapura - Mansarovar – Balaji Mod	16.0	9,400
Total Phase-3 (2041)	**57.8**	
Phase 4A: Jagatpura Rly Stn – Khatipura Rly. Stn. Spur	6.5	1,550
Phase 4B: Galta Ji – Jal Mahal - Amer	9.5	6,600
Phase 4C: Transport Nagar – Bagrana (Extn of Phase-1C)	10.4	5,380
Phase 4D: Kalwar Road – Laxmi Narayanpura (Extension of Phase-3B)	11.1	7,200
Total Phase-4 (2055)	**37.5**	
Total Metro Network (Phase 2, 3, 4)	**138.1**	

FIGURE 4.1 PROPOSED MRTS CORRIDORS IN JAIPUR



4.2.2. Proposed Bus System Plan

In addition to existing bus routes operated by JCTSL, a total of 9 medium-capacity demand corridors have been identified across the entire study area on which the normal bus-based PT system is proposed to be operated. Also, one existing bus route number 24 is proposed to extend its operation to another satellite town, Pachar, for enhancing connectivity. The routes have been designed to integrate with the proposed MRTS corridors and facilitate seamless passenger transfers. The standard low-floor AC Buses (E-buses) are proposed to be operated on these corridors. The details of proposed standard bus routes are presented in **FIGURE 4.2** and **TABLE 4.2.**

In addition, 15 Midi bus routes have been identified along low-capacity demand corridors to enhance network coverage. These routes are proposed to function as feeder services to the existing and proposed MRTS corridors as well as the city bus system, thereby strengthening first- and last-mile connectivity. Midi buses are proposed to be operated along these corridors to ensure operational efficiency and suitability to the prevailing traffic and demand conditions. The nominal capacity of standard (12 m) bus is 70 passengers, while for midi bus (9 m) is 40 passengers. The details of proposed feeder bus routes are presented in **FIGURE 4.3** and **TABLE 4.3.**

FIGURE 4.2 PROPOSED STANDARD BUS ROUTES IN JAIPUR

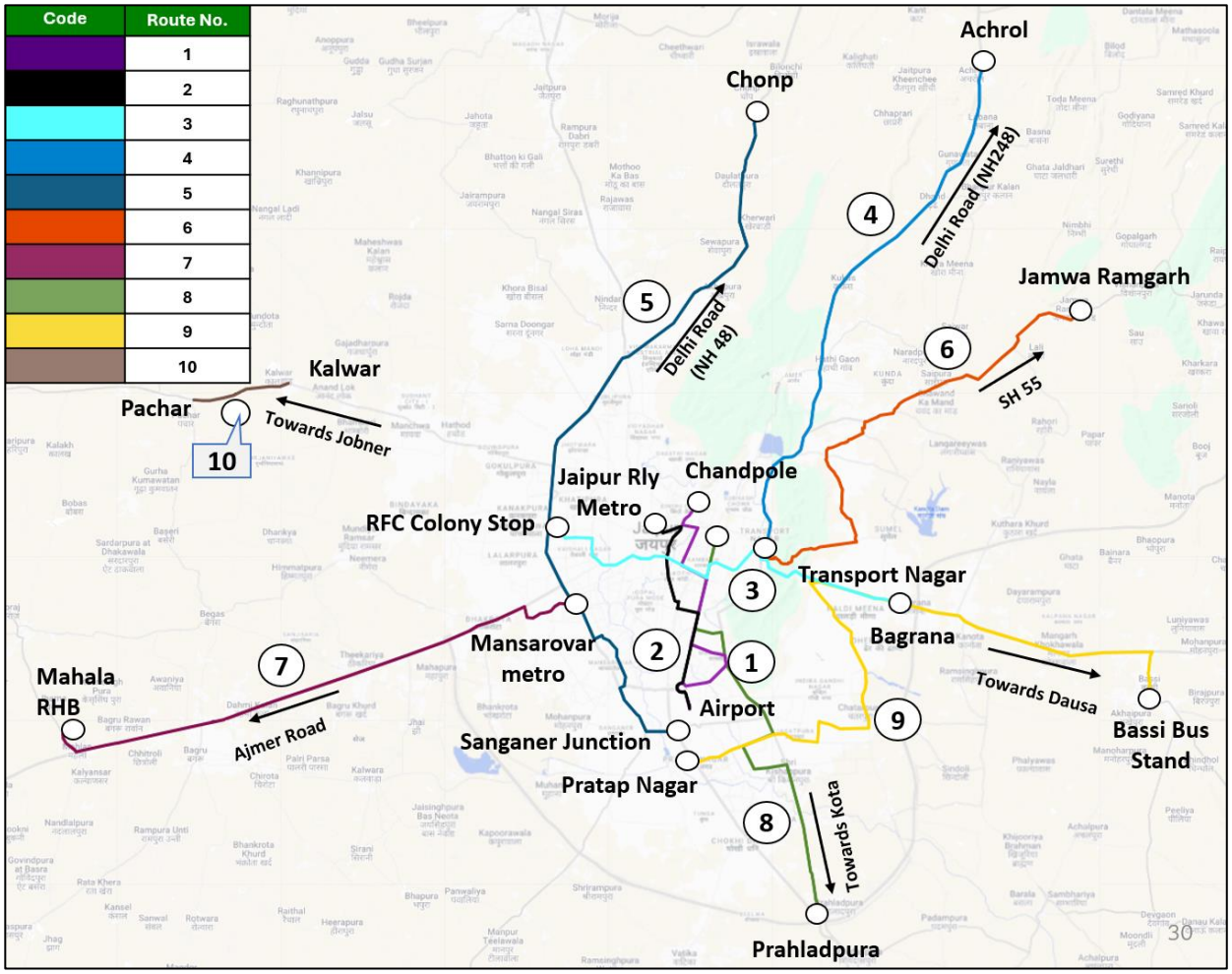


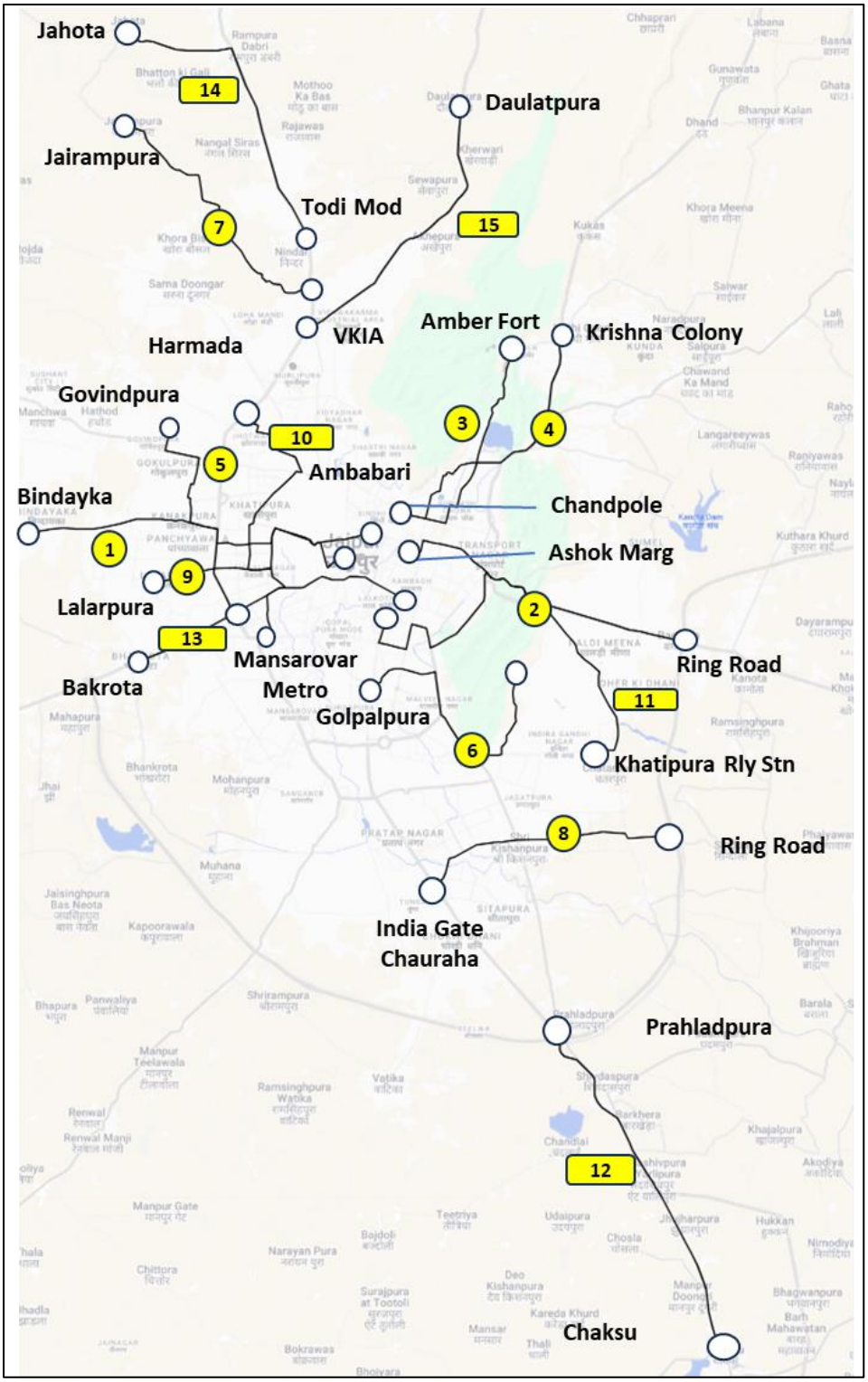
TABLE 4.2 DETAILS OF PROPOSED STANDARD BUS ROUTES IN JAIPUR

ROUTE NO.	FROM	TO	VIA	ROUTE LENGTH (KMS)	NUMBER OF BUSES
STANDARD BUS ROUTES					
1	Airport	Chandpole	Balaji Mod, OTS (MNIT), Gandhi Circle, Rambagh Circle, Statue Circle, C Scheme	16.4	13
2	Airport	Jaipur Railway Metro	OTS (MNIT), Laxi Mandir Tiraha, 22 godam, Govt Press	13.1	11
3	Bagrana	RFC Colony Stop (JDA Parking) (Vaishali)	Amrapali, Rotary Circle, Trimurty, 22 godam, Ram Nagar metro, Purani Chungi	22.4	17
4	Achrol	Transport Nagar	Gunawata, Dhandh, Kukas, Hathi Gaon, Jaisinghpura, Guru nanak dev circle, Galta Gate	30	22
5	Chonp	Sanganer Junction	Bagwara, Daulatpura, Laxminarayanpura, VKIA, Laxmi Nagar, Ram Nagar Extn, Nemi Nagar Extn, 200ft Ajmer, Mansarovar metro, VT Road circle, New Sanganer	41.4	30
6	Jamwa Ramgarh	Transport Nagar	Heerawala. Saipura, Nai ki Thade, Rohit Nagar, Ganga Vihar	28.2	21
7	Mahala Rajasthan Housing Board (RHB)	Mansarovar Depot	Jaipur Logistics Park, Chitroli Bus stand, Thikariya Mod, Bhankrota, Heerapura, Jaisinghpura	30.8	23
8	Prahladpura	New Gate	Bagda meena chouraha, Akshay Patra Circle, Bhartiya Vidhya Bhawan, Maharana Pratap Circle, 7 No. Chauraha, Jagatpura Railway Station, Balaji Mod, Rajasthan Internation Centre, OTS (MNIT), Jawahar Kala Kendra, JDA circle	25.7	19
9	Pratap Nagar	Bassi Bus Stand	Jagatpura, Dantli, Khatipura Railway Station, Luniyawas, Prem Nagar, Kanota	41	30
10	Kalwar	Pachar	Extension of existing JCTSL route number 24	5.2	
TOTAL NETWORK LENGTH (KM) AND NUMBER OF BUSES				**254.2**	**187**

TABLE 4.3: PROPOSED MIDI BUS ROUTES IN JAIPUR

ROUTE NO.	FROM	TO	VIA	ROUTE LENGTH (KMS)	NUMBER OF BUSES
1	200 ft Ajmer Stop	Bindayaka (RIICO)	Gandhipath Puliya, Panchawala Puliya, Kanakpura Railway Station, Hatoj Mod	12	10
2	Ashok Marg	Ring Road (Bagrana)	New Gate, Golcha Garden, Vidyadhar Bagh, Ghat ki Guni Bus stop, Tilak Hospoital	13	11
3	Chandpole	Amber Fort	Hawa Mahal, Joraver Singh Gate, Jal Mahal, Air Force Office	10.2	9
4	Choti Choupar	Krishna Colony	Ramgarh, Ramgarh Mod Bus Stand, Sri Guru Gobind Ji Circle, Sadwa Masjid Mod,	11.3	10
5	Civil Lines Metro	Kardhani Govindpura	KV No. 4, Vaishali Circle, Bajari Mandi, Kanakpura	13.9	11
6	Gopalpura	Kho Nagoriyan	MNIT, KV No. 3, Rajput Colony, Haldiya Garden, Model Town, Jagatpura Railway crossing, Railway Officers Colony, RTO Jagatpura	12	10
7	Harmada	Jairampura	Nindar Fort, Govindpura	12	10
8	India Gate Choraha	Ring Road (Siroli)	Gautam Buddha Circle, Riksha Narsinghpura Circle, Siroli	11	9
9	Lalarpura	Khasa Kothi	Jaipur Club, Khatipura, Vijay Dwar, Gandhi Path Pulia	11.2	9
10	Mansarovar Metro	Vardhman Horizon	Kings road, Purani Chungi, Amrapali Circle, Khatipura Mod, Jhotwara, Ajay Circle	14	11
11	Nehru Bal Udhyan	Khatipura Railway Station	KV No. 1, Gandhi Circle, Aranya Bhawan, RSEB Substation, Jawahar Nagar Circle, Transport Nagar, Vidhyadhar Bagh, New Khadelwal Nagar, Oberoi Rajvilas, Luniyawas, Ropada Mod	19.5	15
12	Prahladpura	Chaksu	Shivdaspura, 19 Mill, Sri Ram Circle, Jujhapura, Shitla Mata	15.7	13
13	Ram Bagh Circle	Bhakrota	Ambedkar Circle, 22 Godam, Ramnagar metro, Purani Chungi, Heera Nagar, 200 Ft bypass, Kamla Nehru Pulia	12.4	10
14	Todi Mod	Jahaota Bus Stand	Shri Balaji Dham Colony, Rampura (Dabri)	13.1	11
15	VKI Road. No. 14	Daulatpura	Laxminarayanpura	12.4	10
TOTAL NETWORK LENGTH (KM) AND NUMBER OF BUSES				**193.7**	**160**

FIGURE 4.3 PROPOSED MIDI BUS ROUTES IN JAIPUR



a) Strategy for Augmentation of Bus Fleet

As part of public transport, augmenting the existing city bus/shared auto services has been considered. The proposed public transport system is derived considering all the factors of existing situation and best possible reorganization factoring all components of an efficient and sustainable system.

To enable the shift from existing intermediate public transport modes (Shared Auto/Auto/e-Rickshaw) and private vehicles, a reliable and efficient public transport system is needed in the form of a dedicated bus transport system.

The total fleet requirement for the city bus system has been estimated at 1,200 buses for the horizon year 2055, proposed to be inducted in three phased stages. The fleet size assessment has been carried out in accordance with Urban Bus Specifications, projected travel demand, and the target modal split envisaged under the CMP, taking into account population growth, spatial expansion of the city, and the role of buses as the primary mass public transport mode. The phased fleet augmentation requirement for the city bus system has been assessed as 550 buses up to the year 2031, followed by 380 buses during Phase II (2031–2041) and 270 buses during Phase III (2041–2055), based on projected travel demand and service level requirements.

It is proposed that along with GPS, all the buses must have security cameras and panic buttons linked to a control center for incident detection and swift response. The existing transport modes i.e. autos/ shared autos will act as paratransit modes, serving as a feeder mode to nodes on the bus corridors providing last-mile connectivity.

b) City E-Bus System

A shift towards clean energy for public transport brings multi-dimensional benefits. The induction of E-buses will add to the emission reduction commitments at the local level. However, the use of motorized modes of transport will increase the carbon footprint of the city. Electric buses, when compared to the conventional bus, have fewer moving parts. This results in lower and more predictable operating costs. The dependence on fossil fuels poses uncertainties due to price fluctuations, while the cost of electricity is stable for e-buses.

The buses have been proposed with following specifications:

- Modern low floor buses, each with two wide doors allowing passengers to board and alight quickly and easily and 8 passengers can alight at a time.
- Considering the geometry of the road, severe congestion, haphazard parking short wheelbase buses will be suitable to run in the city. The buses should have an optimum capacity for sitting and standing passengers based on the passenger demand. It will save time and improve per kilometre performance.
- The E-buses which have been allotted to city under FAME India scheme Phase-II are of 9 m in length.

4.2.3. Bus Infrastructure Requirement

a. Bus Terminals and Depot

Sindhi Camp is the only major bus terminal located in city core area which serves the inter-city travel demand of State Transport buses in Jaipur. A minor intercity bus terminal is located in Ghat ki Guni in the study area, apart from the Sindhi Camp terminal. At present, three main depots (at Sindhi Camp, Pratap Nagar, and Vidhyadhar Nagar) are operational for the maintenance of intercity buses and a minor depot is located at Vidhyadhar Nagar.

Urban traffic congestion, particularly around central bus terminals, remains a major challenge for efficient city mobility. To address this, a direction-oriented bus terminal system is proposed, aimed at decongesting the city core by decentralizing intercity and intracity bus operations.

Sindhi Camp Bus Stand should be re-developed as a modern Intermodal Integrated ISBT Hub with facilities for operation of Roadways as well as private inter-city buses, along with providing connectivity for last-mile/ intra-city connectivity via planned bus bays for intra-city buses, IPT (Auto/ Taxi/ E-Rickshaw) bays and multi-level car parking. This would be supplemented by provision of adequate passenger amenities, bus operational facilities, development of commercial, hotels and office spaces. The proposed handling capacity of terminal is 1200 bus/day and capacity of MLCP is 1000 ECS.

It is proposed to develop Heerapura as the major intercity bus terminal where majority of intercity buses (government & private) are proposed to be originated/ terminated as its handling capacity is 1100 bus/day. This will shift long-distance bus traffic away from central areas, easing congestion and pollution in the core zones. The Heerapura site for the new Bus Terminal is located on Ajmer Road at a distance of about 3.0 km from the junction of C-Zone bypass and Jaipur-Ajmer Road (NH 8) and is about 10 km from Jaipur Railway Station and 12 kms from the Sindhi Camp Bus terminal. The site belongs to RSBTDA. The area of total site is about 54,000 Sq m.

In addition, Satellite bus terminals have been proposed at the following locations:

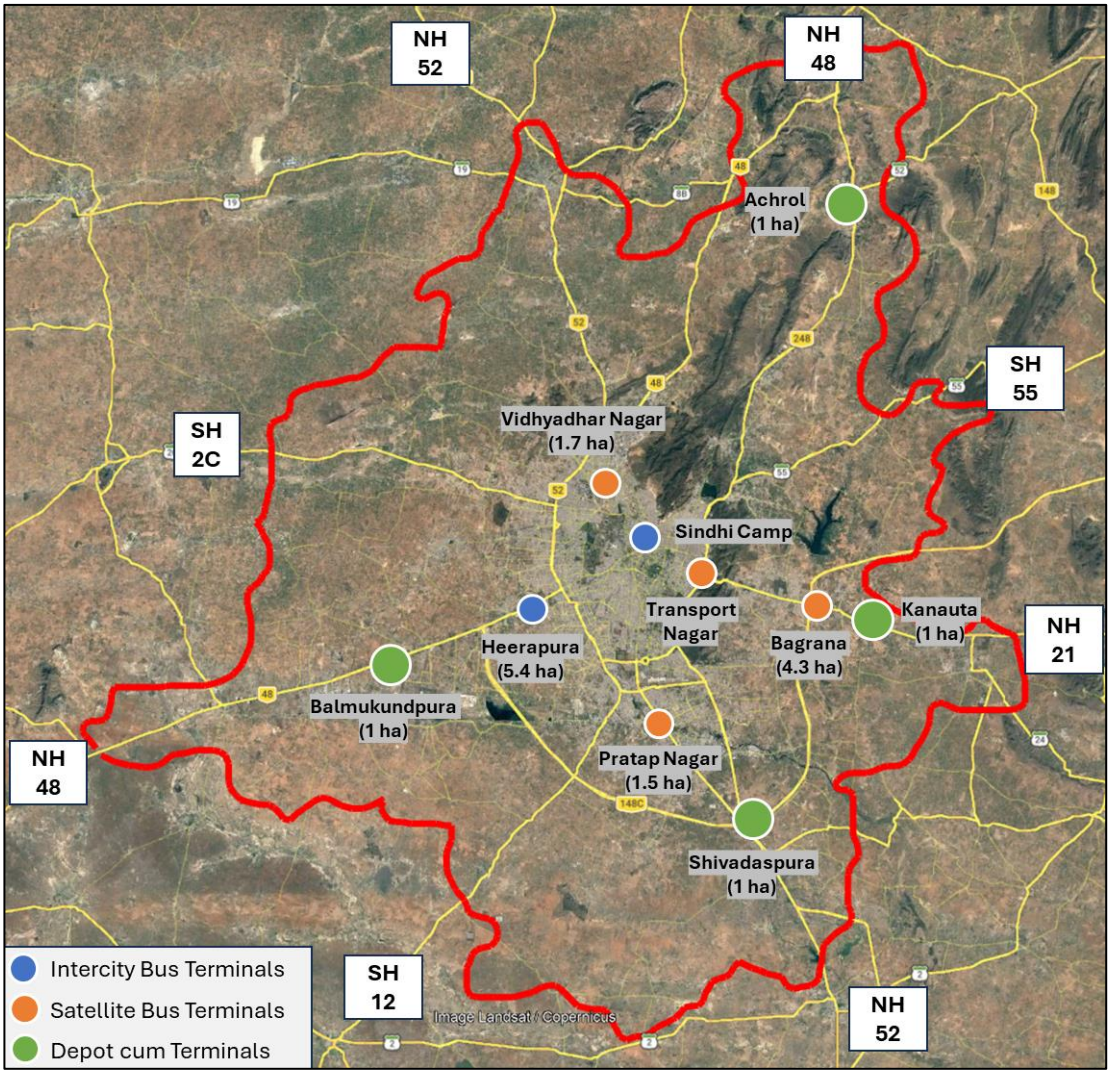
i. Bagrana (4.3 Ha, handling capacity 780 bus/day) – Serving buses approaching/leaving from Agra side
ii. Pratap Nagar (1.5 Ha, handling capacity 350 bus/day) – To handle routes towards Tonk side
iii. Vidyadhar Nagar (1.7 Ha, handling capacity 500 bus/day) – For buses moving towards Sikar side
iv. Transport Nagar (handling capacity 50 bus/day) – Will act as a transit stop

At present, three depots (at Bagrana, Sanganer and Todi) are operational for JCTSL Intracity buses. Appart from these depots, the Depot cum terminals have been proposed at following locations:

- Balmukundpura (JDA land with 1 Ha area)
- Shivadaspura (RSBTDA land with 1 Ha area)
- Kanauta (RSBTDA land with 1 Ha area)
- Achrol (RSBTDA land with 1 Ha area)

These locations will serve dual purposes: operating as both bus terminals and maintenance depots. It will enhance operational efficiency by combining passenger services with bus parking, fueling, and maintenance facilities. The proposed intercity bus terminals and bus depots have been presented in **FIGURE 4.4**.

FIGURE 4.4 PROPOSED INTERCITY BUS TERMINALS & DEPOTS IN JAIPUR



c) Charging Infrastructure for E-Buses

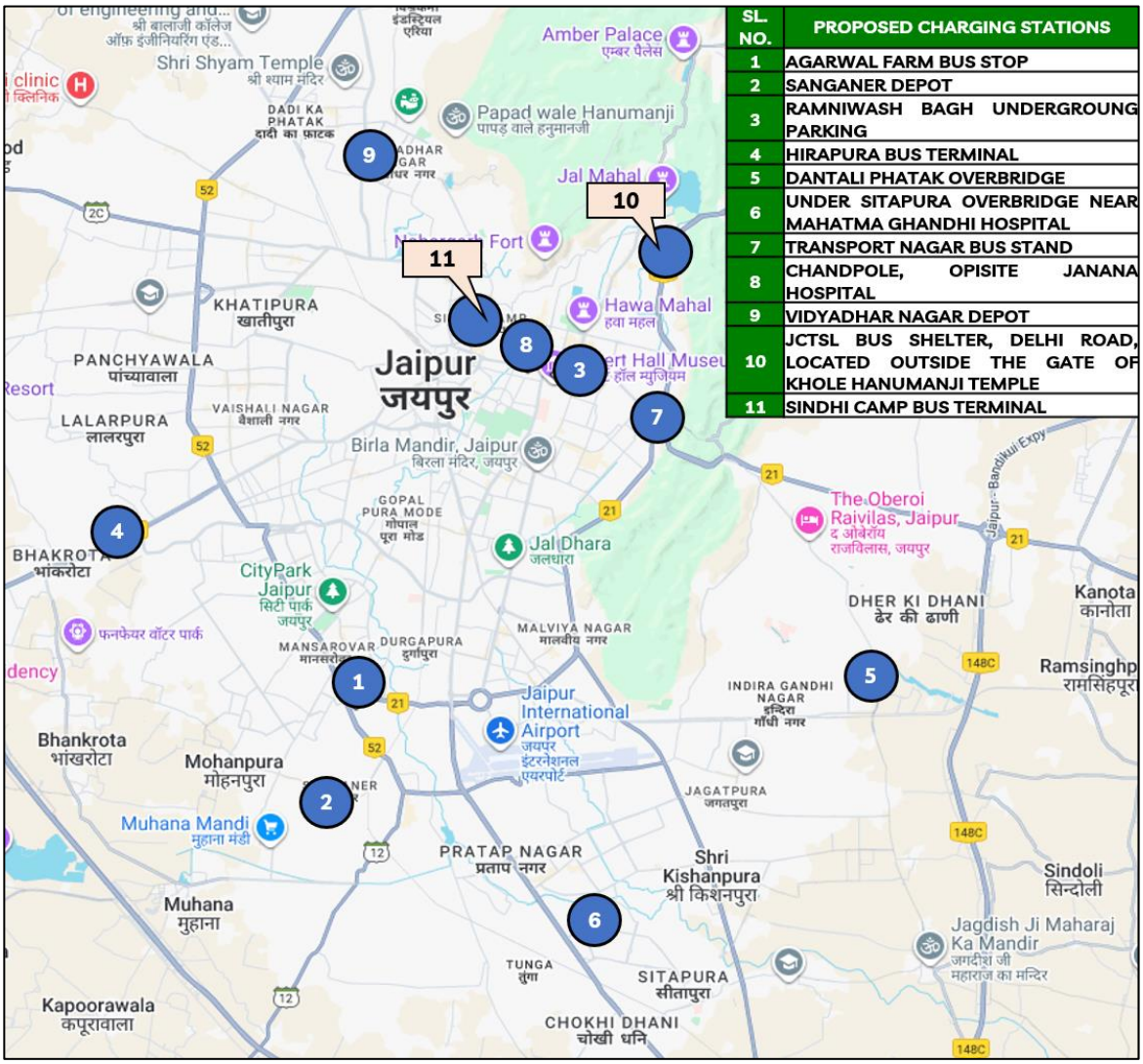
Charging infrastructure deployment is a crucial factor of electric vehicle adoption. The charging stations can be set up at bus depots or at specific locations based on the requirement. The number of slow and fast chargers can be worked out based on the number of buses.

The charging station infrastructure includes the following components:

i. Land
ii. Electricity. (11KV/ 33 KV – 3 phase)
iii. Shed or semi-open premises
iv. Step down transformers
v. Switch Gears
vi. Manpower for operations

Electric vehicle charging infrastructure has been proposed to be set up in the various locations of bus terminals, depots, major commercial areas etc. in **FIGURE 4.5**

FIGURE 4.5: PROPOSED CHARGING STATIONS FOR E-BUS



SL. NO.	PROPOSED CHARGING STATIONS
1	AGARWAL FARM BUS STOP
2	SANGANER DEPOT
3	RAMNIWASH BAGH UNDERGROUNG PARKING
4	HIRAPURA BUS TERMINAL
5	DANTALI PHATAK OVERBRIDGE
6	UNDER SITAPURA OVERBRIDGE NEAR MAHATMA GHANDHI HOSPITAL
7	TRANSPORT NAGAR BUS STAND
8	CHANDPOLE, OPISITE JANANA HOSPITAL
9	VIDYADHAR NAGAR DEPOT
10	JCTSL BUS SHELTER, DELHI ROAD, LOCATED OUTSIDE THE GATE OF KHOLE HANUMANJI TEMPLE
11	SINDHI CAMP BUS TERMINAL

b. Bus Stops

The bus stops have been proposed along all the proposed bus routes in addition to existing bus stops to support the proposed bus transport system. The bus stops should provide comfort and convenience to passengers as well as give a distinct identity to the system. The proposed bus shelters shall incorporate universal accessibility features, including barrier-free access, tactile flooring, appropriate kerb heights, and adequate space for persons with reduced mobility. Weather protection along with ticketing and route information, wayfinding signage, and passenger information systems are highly desirable features to provide a pleasant experience. Therefore, modernization of existing bus shelters has been proposed with features of Intelligent Transportation System including traveler information system and advertisement space. The authority can generate additional revenue through advertisements on the bus shelters.

The placement of bus stops is proposed at a distance of 500 – 1000 m. The length of the platform is determined based on detailed service parameters such as peak hour bus frequency, peak hour passenger flow on the bus stop, routing and stopping plans, etc. As a thumb rule, for accommodating two buses of 12 m length, a bus bay of 30 m length may be planned.

DESIGN ASPECT	KEY DESIGN PROVISIONS
LOCATION PLANNING	Located along bus corridors, near transit nodes and activity centres; integrated with footpaths and pedestrian crossings; free from conflicts with utilities and driveways.
SHELTER SIZE & LAYOUT	Minimum shelter length 6.0 m; minimum clear footpath width 1.8 m; wheelchair manoeuvring space of 1500 mm × 1500 mm; seating with backrests and armrests.
BARRIER-FREE ACCESS	Step-free entry; level difference ≤ 12–15 mm; ramps (where required) with maximum gradient of 1:12; obstruction-free pedestrian access.
TACTILE FEATURES	Tactile guiding tiles connecting shelter to footpath/crossing; warning tactile tiles at kerb edges; high colour contrast with surrounding pavement.
KERB & BOARDING INTERFACE	Uniform kerb height of 150–180 mm to facilitate easy boarding and alighting; defined bus stop docking zone.
PASSENGER INFORMATION & SIGNAGE	Route maps, timetables, and stop IDs at 900–1600 mm height; large fonts, high contrast colours; provision of Braille and tactile signage.
ITS INTEGRATION	Real-time passenger information displays; provision for CCTV surveillance; audio-visual systems at high-demand locations.
LIGHTING & SAFETY	Adequate illumination without glare; clear sightlines; vandal-resistant materials; non-slip flooring.
WEATHER PROTECTION & COMFORT	Covered shelter with adequate overhang; protection from sun, rain, and wind; rounded edges and durable finishes.

4.2.4. Intermediate Public Transport (IPT)/Paratransit System

At present para-transit operation comprising cycle rickshaws, autos and shared auto rickshaws are operated by individuals not on fixed routes. The infrastructure required for their parking/ stops/ terminals etc. is almost non-existent. As para-transit plays an important role in total transport system envisaged for the city, following recommendations have been proposed to improve their operations:

- Appropriate parking/stands at all locations, such as:
  - Commercial areas like shopping malls and retail areas
  - Public spaces like parks and tourist locations
  - Residential colonies: each colony to have an authorized auto-rickshaw stand.
- Dedicated parking lot with facilities like drinking water, toilet and maintenance facility
- Stopping and boarding facilities in sync with bus-stops so that the shared auto services are integrated with city buses and act as a feeder mode to them.
- Shared autos to be used as both a primary public transport system in the outgrowth areas where the demand is not justified as bus system, and as a feeder service to city buses in other areas based on corridor demand.
- Shared auto- rickshaws should be issued route permits/ licenses across mobility corridors.
- Existing diesel autos are the major contributor of pollution in the city. It is therefore proposed to roll out the existing diesel autos in phases. Shared autos may be replaced with e-autos in phases. This will promote environmental sustainability by achieving low carbon emissions.
- To support the transition to e-autos, provision of adequate charging infrastructure and battery swapping stations has been envisaged at strategic locations across the city. These facilities are proposed to be located near major auto stands, transit hubs, bus terminals, metro stations, and high-demand activity centres to ensure operational convenience and minimise vehicle downtime. The locations proposed for E-auto Charging/Battery Swapping stations are presented at **TABLE 4.5 and FIGURE 4.7**
- Auto-rickshaws should be issued area-based permits/ licenses with permission to ply on all roads and corridors including the mobility corridors. This shall be necessary since they cater end-to-end trips and hence they would require access to all roads and links.

Total 29 IPT routes have been proposed which will feed to the major trunk PT corridors including MRTS and Bus corridors. These routes are given in **FIGURE 4.6** and **TABLE 4.4**.

TABLE 4.4 PROPOSED IPT ROUTES IN JAIPUR

S. NO.	FROM	TO	LENGTH (KM)
1	200 ft Ajmer Bus Stop	Hyatt Regency	8.5
2	Badi Chaupar	Jawahar Nagar	5.9
3	B2 Bypass Circle	Jagatpura Rly Stn	6.2
4	B2 Bypass Circle	Mansarovar Metro	7.8
5	B2 Bypass Circle	Muhana Anaj Mandi	10.9
6	Chandpole Metro	Vidhyadhar Nagar PS	6.4
7	Durgapura PS	Bharatmata Circle	8.9
8	Durgapura PS	Sector 2	5.1
9	Goner Mod PS	Vatika	7.8
10	Goner Mod PS	Goner Bus Stand	8.4
11	Hawa Mahal	Rohit Nagar 5	8.9
12	Krishna Colony	Naradpura Bus Stop	4
13	Nehru Bal Udyan	Mahesh Nagar Bus Stop	5.6
14	New Atish Mkt Metro	Gopalpura PS	3.6
15	Pratap Nagar PS	Dadiya	6.5
16	Pratap Nagar PS	Vivek Techno School	9.8
17	Prahladpura	Chandlai	6
18	Rambagh PS	Ramnagar Metro	5.5
19	Ramnagar Metro	Dhawas	6.6
20	Sanganer PS	Ratliya	8.9
21	Sanganer PS	Sanganer Rly Station	3.5
22	SMS Hospital PS	Maheshwari Heights	5.4
23	Sitapura PS	Arshadeep (Jeerota)	5.8
24	Todi Mod	Thadi Bus Stop	5
25	Transport Nagar PS	Ganga Vihar	9.8
26	VKI RD NO. 9	ICI Transformers	4.6
27	VKI RD NO. 14	Niwaru Bus Stop	8.2
28	VKI RD NO. 14	Nindhar Benar Rly Stn	5
29	Shyam Nagar Metro	200 ft Ajmer Bus Sto	4
TOTAL NETWORK LENGTH (KM)			**192.6**

FIGURE 4.6 PROPOSED IPT ROUTES IN JAIPUR

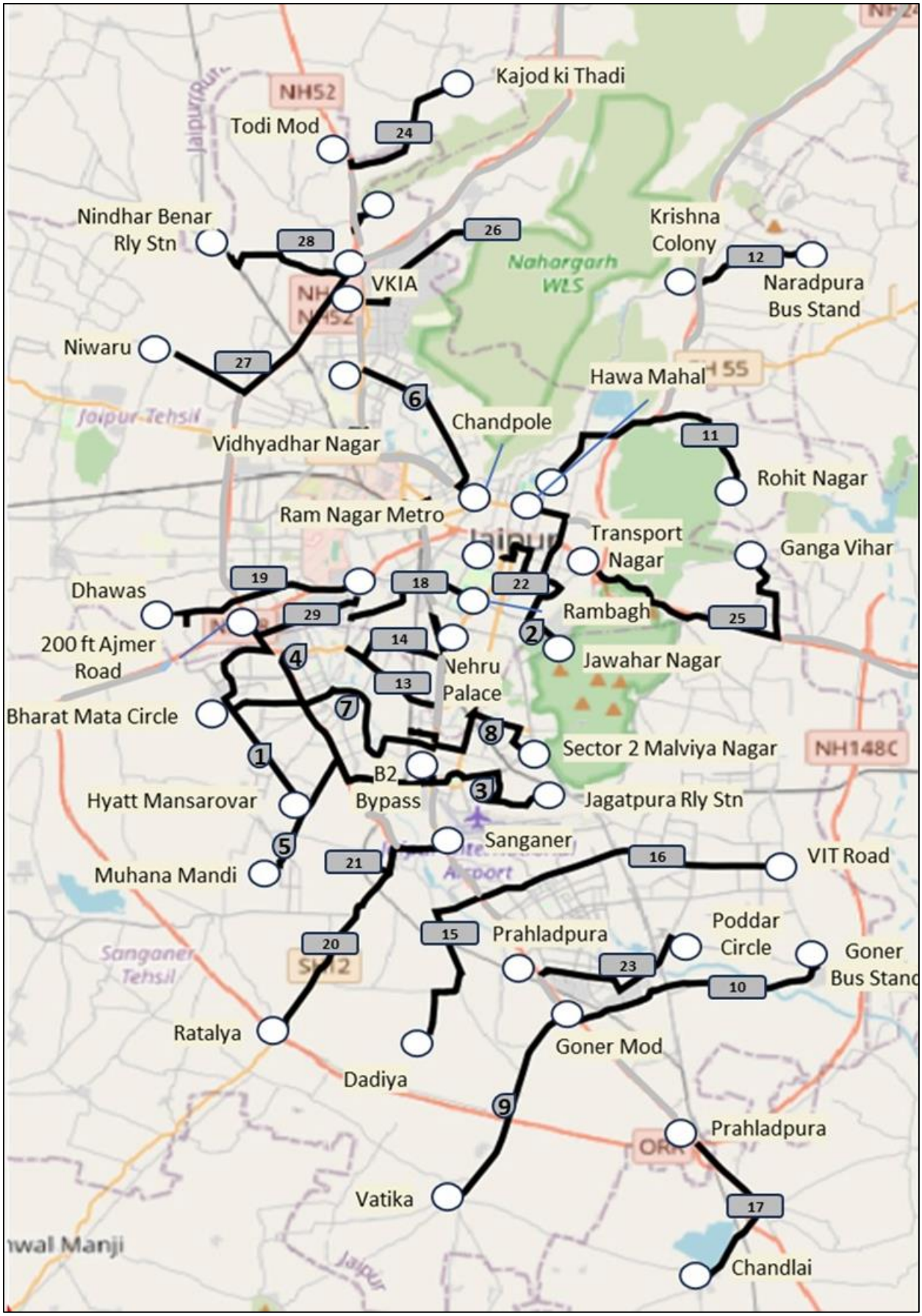
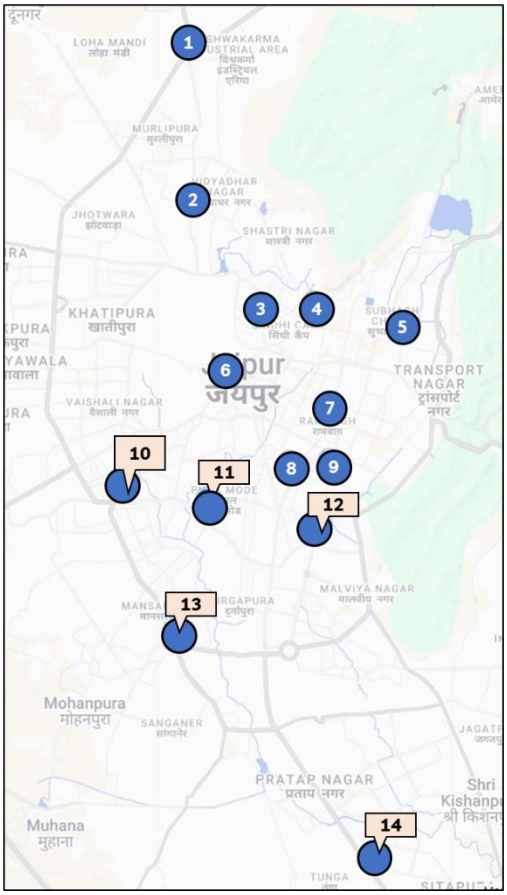


TABLE 4.5: LOCATIONS PROPOSED FOR E-AUTO CHARGING/BATTERY SWAPPING STATIONS

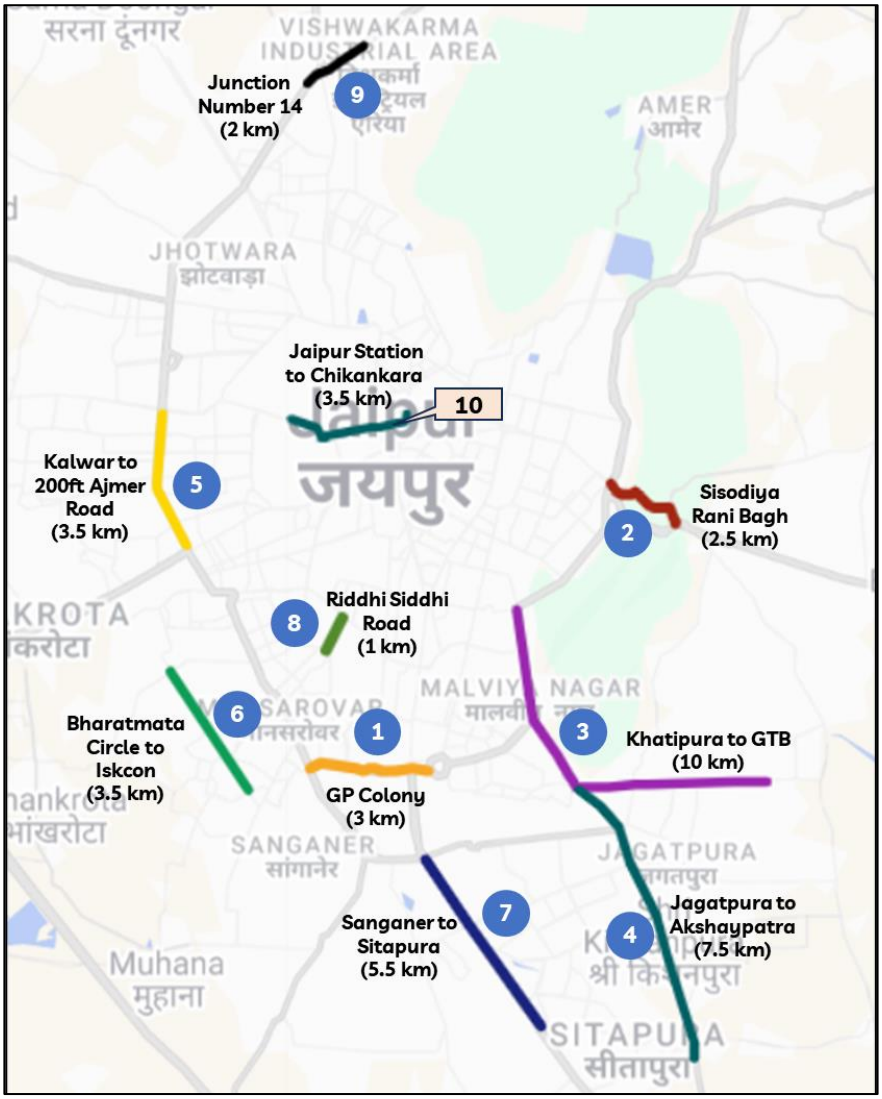
S. NO.	PROPOSED LOCATIONS
1	VKIA Rd 14 Metro station
2	Vidhyadhar Nagar Sec 2 Metro station
3	Collectorate Metro station
4	Chandpole Metro station
5	Civil Lines Metro station
6	Ramganj Choupar
7	Narayan Circle Metro station
8	Nehru Udhyan
9	Gandhi Circle
10	Mansarovar Metro station
11	Riddhi Siddhi Circle
12	MNIT Circle (OTS Circle)
13	Bhagat Singh Chauraha, New Sanganer Road
14	Sitapura Metro station

FIGURE 4.7: LOCATIONS PROPOSED FOR E-AUTO CHARGING/BATTERY SWAPPING STATIONS



To ensure smooth traffic flow and enhance road safety, No E-Rickshaw Zones are proposed in identified high-capacity arterial roads, grade-separated corridors, and congestion-prone areas of the city. These zones are recommended where mixed traffic operations involving slow-moving e-rickshaws lead to speed differentials, capacity reduction, and safety conflicts with fast-moving vehicles. Restricting e-rickshaw operations in such corridors will improve travel speeds, reduce bottlenecks, and enhance overall corridor efficiency. Total 10 routes have been proposed as given in **FIGURE 4.8.**

FIGURE 4.8: PROPOSED NO E-RICKSHAW ROUTES



4.3. ROAD NETWORK DEVELOPMENT PLAN

4.3.1. Mobility Corridors

Jaipur city exhibits a radial and grid-iron pattern of road network, with its major radial roads functioning as the arterial corridors of the city. These arterials carry a significant share of intra-city traffic and act as the primary mobility spines connecting different

parts of Jaipur. Historically, the radial roads originated from the walled city area extending outward and integrating with the newer grid-based developments. Over time, these arterial roads have become key corridors linking the core city to peripheral growth centers. Jaipur is also traversed by two major National Highways—NH 48 (Delhi–Ajmer–Mumbai Corridor) and NH 52 (Jaipur–Kota–Bhopal Corridor)—which serve both regional and urban functions, facilitating through traffic, freight movement, and city-level connectivity. Following mobility corridors have been identified:

a. Outer Ring Road

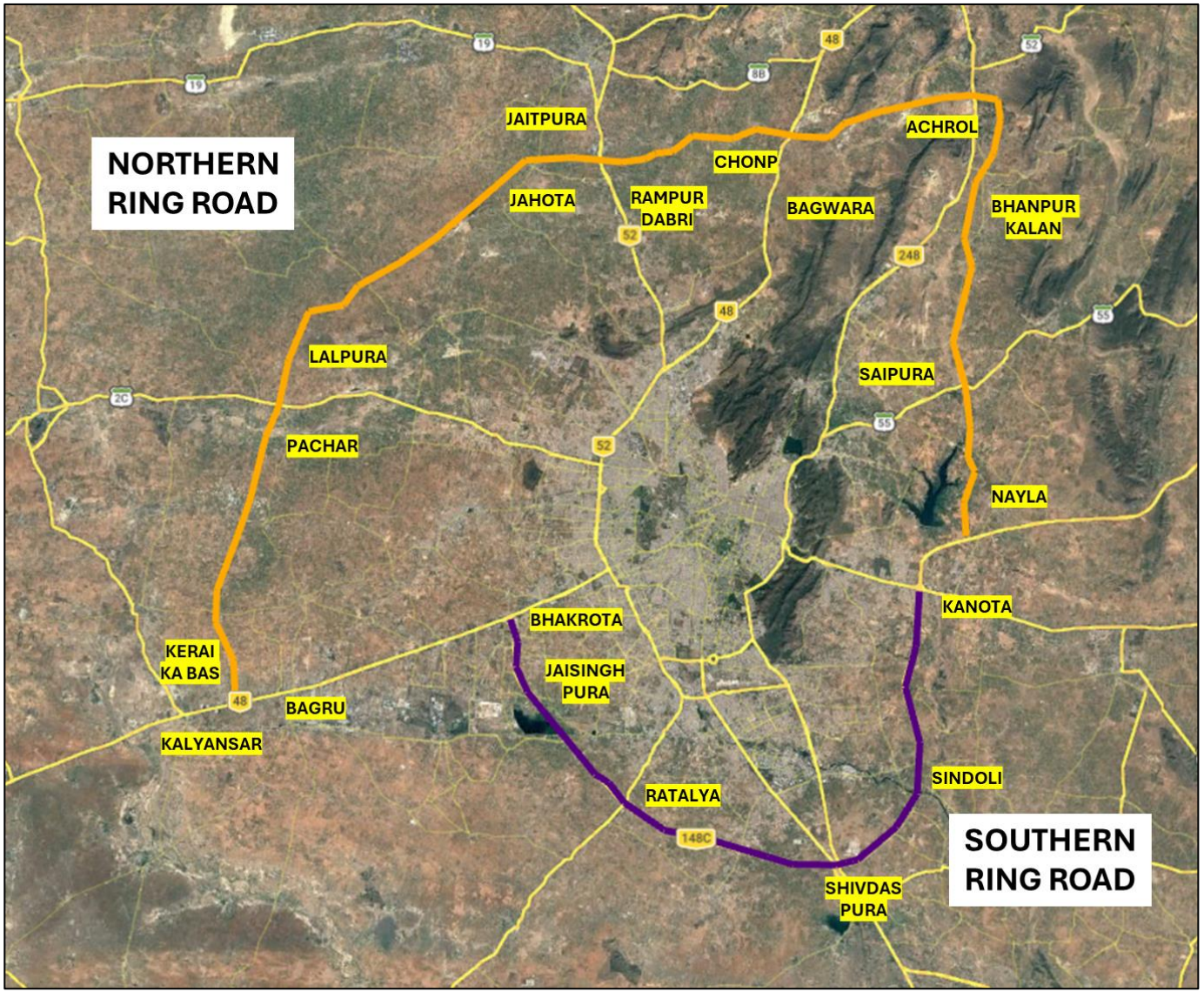
The Southern Alignment of the Outer Ring Road (47 km) is completed and operational. This section functions as a major bypass for through traffic while simultaneously promoting planned urban expansion along the southern periphery of Jaipur.

The Northern Alignment of the Outer Ring Road (ORR) as shown in **FIGURE 4.9.** The proposed Northern Outer Ring Road (ORR) is planned to traverse through the peripheral areas of Bagru, Pachar, Jaitpura, Achrol, and Bhanpur Kalan forming a strategic circumferential corridor around the northern edge of the urban area and connecting the satellite towns. The total length of the proposed northern alignment is approximately 99 km.

The main transport corridor of the Ring Road is planned as a 90 m wide strip, for development of a 6-lane access-controlled carriageway (3 lanes on each side, with median and service facilities). Service roads / slip roads are proposed along either side within the remaining width to segregate through traffic from local access. The Development Corridor / PAP Corridor (135 m on either side) will accommodate supporting infrastructure such as utility corridors, feeder roads, drainage, landscaping, and resettlement

The Northern Ring Road alignment is strategically designed to divert heavy vehicular traffic away from Jaipur city, enhance high-speed connectivity between highways, and unlock growth potential in underdeveloped peripheral areas. The alignment will also improve access to emerging urban nodes, industrial clusters, and satellite towns. The final detailing of the northern portion, including the tunnel and junction designs, may be undertaken at the implementation stage to ensure optimum efficiency, safety, and environmental sustainability.

FIGURE 4.9: PROPOSED NORTHERN ALIGNMENT OF OUTER RING ROAD IN JAIPUR



b. Grade Separated Facilities

To address rising traffic congestion at critical junctions and along high-volume corridors, grade-separated facilities such as flyovers, underpasses, and elevated corridors are proposed at key locations across Jaipur. These grade-separated facilities are planned along major arterial and sub-arterial roads where surface capacity is inadequate, and right-of-way expansion is constrained. The elevated corridors will facilitate the uninterrupted movement of through traffic, particularly along radial routes connecting to the city core, while flyovers/underpasses at junctions will ease conflict points and reduce travel delays. Together, these interventions aim to improve average travel speeds, enhance safety, and strengthen connectivity between the city's radial network, ring road system, and national highways.

To relieve traffic congestion, flyovers/ underpasses are being planned by NHAI and JDA in the city. The following proposals for grade-separated facilities have been proposed in integration with NHAI and JDA proposals for the city:

- A total of 14 grade-separated road infrastructure projects comprising flyovers, elevated roads, and underpasses have been identified to address major congestion points and improve corridor-level traffic movement within the city.
- The proposals include flyovers at key junctions such as Todi Mod (0.6 km), Nindar Mod (0.7 km), Vijay Dwar (0.8 km), Bilwa (1.8 km), Kanouta Junction (1.0 km), and New Sanganer Road–Bhagat Singh Chouraha (0.8 km) to facilitate uninterrupted through movement.
- Elevated road corridors have been proposed along high traffic stretches, including Aranya Bhawan to Jagatpura ROB (4.4 km) and Chauradiya Petrol Pump to Sanganer Circle (1.2 km) to enhance corridor capacity.
- Underpasses are proposed at critical conflict locations such as Gopalpura Puliya (0.7 km) and Mansarovar Road to Delhi Road at 200 ft Bypass (0.6 km) to segregate traffic streams and reduce delays.
- At the 14 No. Road Junction (NH-48 and NH-52), a grade-separated solution (flyover/underpass) of approximately 0.8 km has been proposed to improve regional and intercity traffic movement.
- Additional connectivity improvements include link flyovers and directional ramps, such as the flyover connecting DCM Road to the existing Ajmer Road flyover at the 200 ft Bypass (0.6 km) and a one-way left-turn elevated facility connecting Ajmer Road to Delhi Road (0.6 km).

Collectively, the proposed interventions cover an approximate cumulative length of about 16.9 km and are aimed at improving travel speeds, reducing junction delays, and

strengthening the overall urban road network. Details of the proposed interventions have been summarized in the following **TABLE 4.6** and are spatially represented in the subsequent **FIGURE 4.10.**

FIGURE 4.10: PROPOSED GRADE SEPARATED FACILITIES (ELEVATED ROADS/ FLYOVERS)

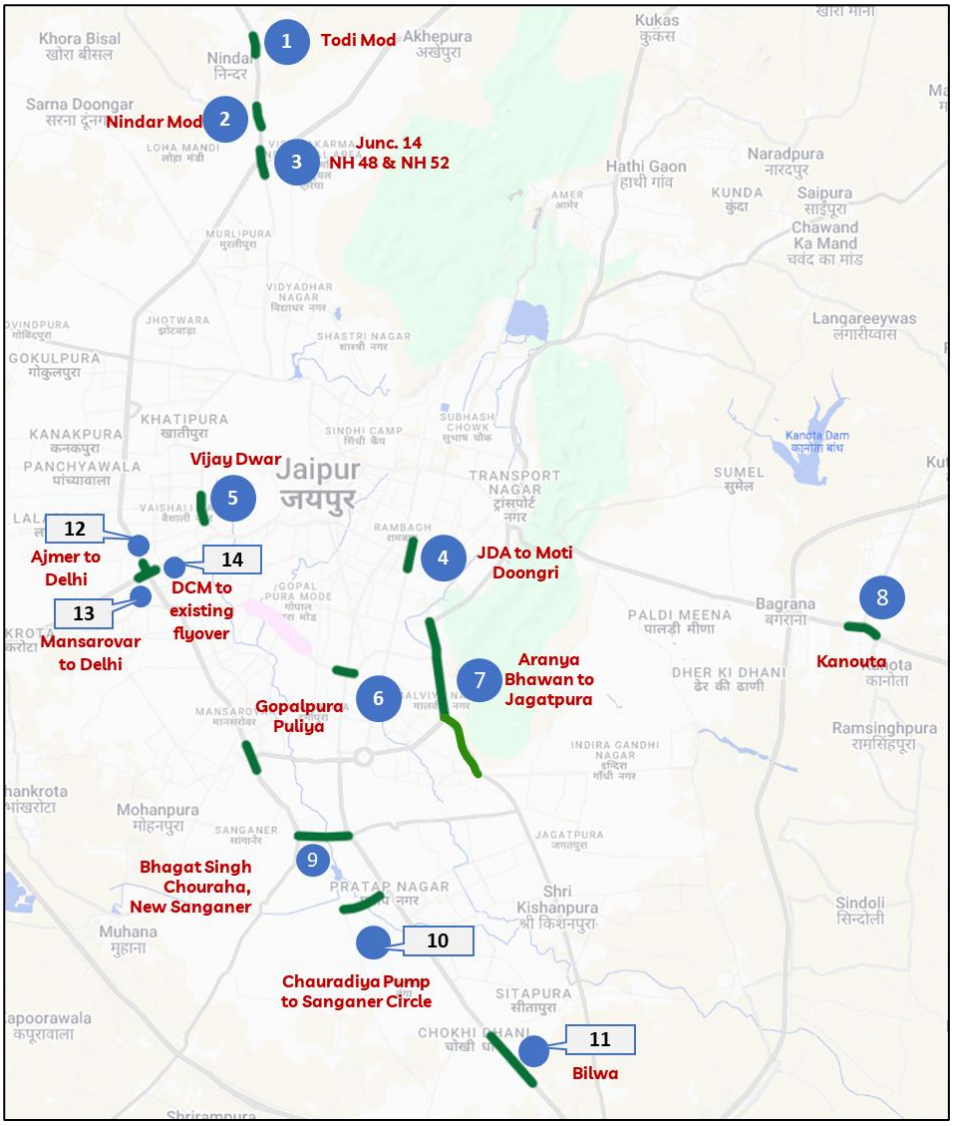


TABLE 4.6: PROPOSED GRADE SEPARATED FACILITIES (ELEVATED ROADS/ FLYOVERS)

S. NO.	PROPOSED ELEVATED ROADS /FLYOVER/ UNDERPASS	LENGTH (IN KM)
1	Todi Mod (Flyover)	0.6
2	Nindar Mod (Flyover)	0.7
3	14 No. Road Junction (NH 48 and NH 52) (Flyover/Underpass)	0.8
4	JDA Circle to Moti Doongri (Flyover)	0.9
5	Vijay Dwar (Flyover)	0.8
6	Gopalpura Puliya (Underpass)	0.7

S. NO.	PROPOSED ELEVATED ROADS /FLYOVER/ UNDERPASS	LENGTH (IN KM)
7	Aranya Bhawan to Jagatpura ROB (Elevated Road)	4.4
8	Kanouta Junction (Flyover)	1.0
9	New Sanganer Road – Bhagat Singh Chouraha (Flyover)	0.8
10	Chauradiya Petrol Pump to Sanganer Circle (Elevated Road)	1.2
11	Bilwa (Flyover)	1.8
12	Ajmer Road to Delhi Road at 200ft Bypass (one way – left turn Flyover)	0.6
13	Mansarovar Road to Delhi Road at 200ft Bypass (Underpass)	0.6
14	Flyover connecting DCM road to existing flyover on Ajmer road at 200 ft Bypass	0.6

4.3.2. Proposed Typical Road Cross Sections

An overall hierarchy of roads has been indicated in the above sections. To allow road network to perform efficiently, continuous stretch of the road needs to be developed as per the recommended cross sections. Three typical cross-sections have been proposed for corridors of 30 m, 45 m, and 60 m ROW with two lanes marked / reserved for public transport movement. The details of the cross sections are presented in **FIGURE 4.11, FIGURE 4.12, FIGURE 4.13, FIGURE 4.14, FIGURE 4.15, FIGURE 4.16, FIGURE 4.17** and **FIGURE 4.18**.

- **60 m RoW:** For corridors with 60 m ROW, recommended cross section includes Divider (3.4 M), 8 lane divided carriage way for traffic movement (14 M both sides), service belt segregating Service Road from main carriageway (0.75 M), Service Lane for two way movement of local traffic (7 M), NMT lane (3.1 M both sides), Footpath (3 M both sides) and Service belt (0.6 M wide) for provision of street lights, street furniture, trees etc.

- **48 m RoW**: For the 48 m RoW, the proposed cross-section includes a central median/divider of 3.0 m, a six-lane divided carriageway for through traffic movement (10.5 m on each side), dedicated NMV lanes/footpaths of 3.7 m width on both sides to support safe pedestrian and non-motorised transport, service roads of 5.5 m width on either side to cater to local traffic and access requirements, and service belts of 1.0 m width for provision of utilities, street lighting, street furniture, and plantation.

- **45 m RoW*:*** The 45 M ROW is proposed with features such as divider (3.6 m), 8 lane divided carriage way for traffic movement which includes bus lane (14 m on each side), NMT lane (3.1 m both sides), Footpath (2.4 m both sides) and Service

belt (0.6 M wide) for provision of streetlights, street furniture, trees etc. No service road is proposed for 45 M ROW.

- **36 m RoW**: For the 36 m RoW, the proposed cross-section includes a central median/divider of 3.0 m, a 4-lane divided carriageway for traffic movement (7.5 m on each side), 5.5 m wide service lanes, footpaths of 2.5 m width on both sides to facilitate safe pedestrian movement, and service belts of 1.0 m width on either side for provision of street lighting, utilities, street furniture, and plantation.

- **30 m RoW*:*** For the 30 M RoW, proposed cross section includes features as divider (1.5 m), 6 lane divided carriage way for traffic movement (10.5 m both sides), NMV Lane / footpath (3.0 m both sides) and service belt (0.6 m wide) for provision of streetlights, street furniture, trees etc.

- **18 m RoW:** For the 18 m RoW, the proposed cross-section includes a two-lane undivided carriageway for traffic movement (5.5 m), footpaths lanes on both sides (1.8 m each), and service belts of 1.5 m width on both sides for provision of street lighting, signage, and essential street furniture.

- **12 m RoW**: For the 12 m RoW, the proposed cross-section comprises a two-lane undivided carriageway for mixed traffic movement (7.5 m), footpaths on both sides (1.5 m each), and service strips of 0.75 m width for utilities and street lighting, ensuring safe pedestrian movement within constrained right-of-way conditions.

- **9 m RoW**: For the 9 m RoW, the proposed cross-section includes a single-lane carriageway in each direction (5.5 m) to cater to local traffic, along with footpaths on both sides (1.2 m each). Due to limited right-of-way, street furniture and utilities are proposed to be accommodated in a shared service zone (0.6 m), with emphasis on traffic calming and pedestrian safety.

FIGURE 4.11: TYPICAL CROSS-SECTION FOR 60 M ROW

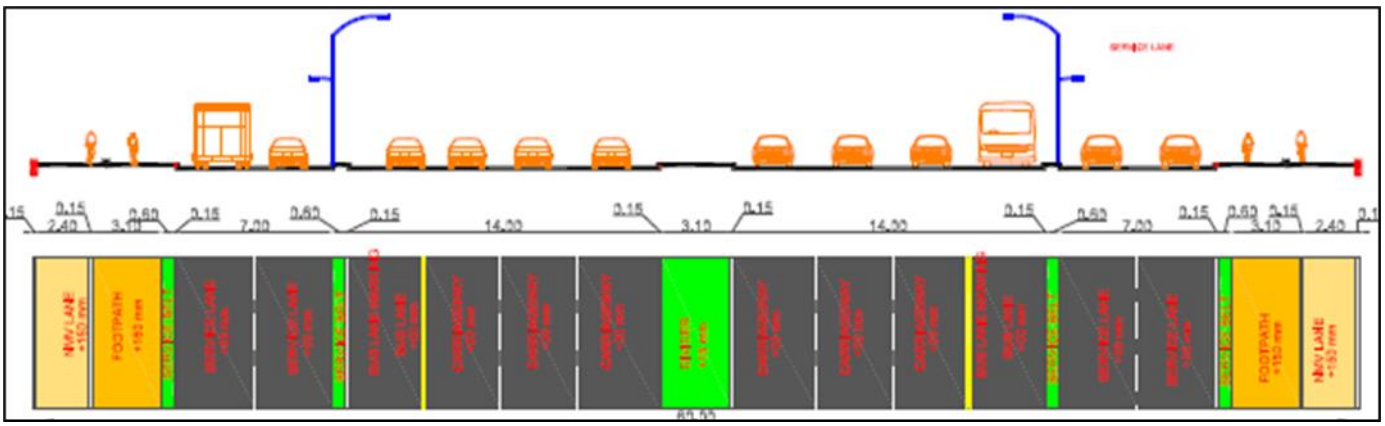


FIGURE 4.12: TYPICAL CROSS-SECTION FOR 48 M ROW

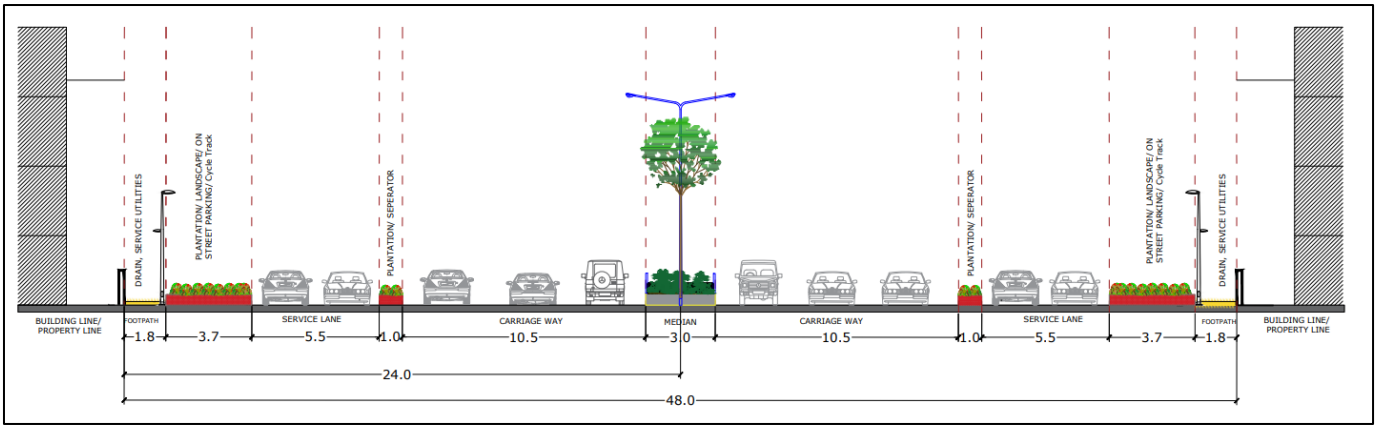


FIGURE 4.13: TYPICAL CROSS-SECTION FOR 45 M ROW

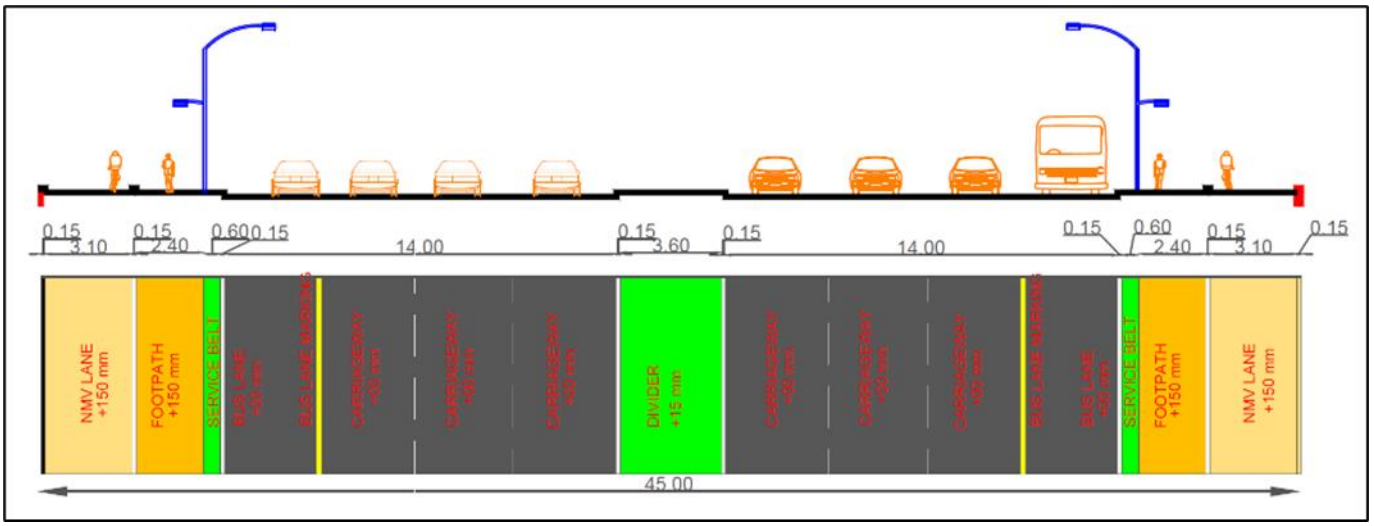


FIGURE 4.14: TYPICAL CROSS-SECTION FOR 36 M ROW

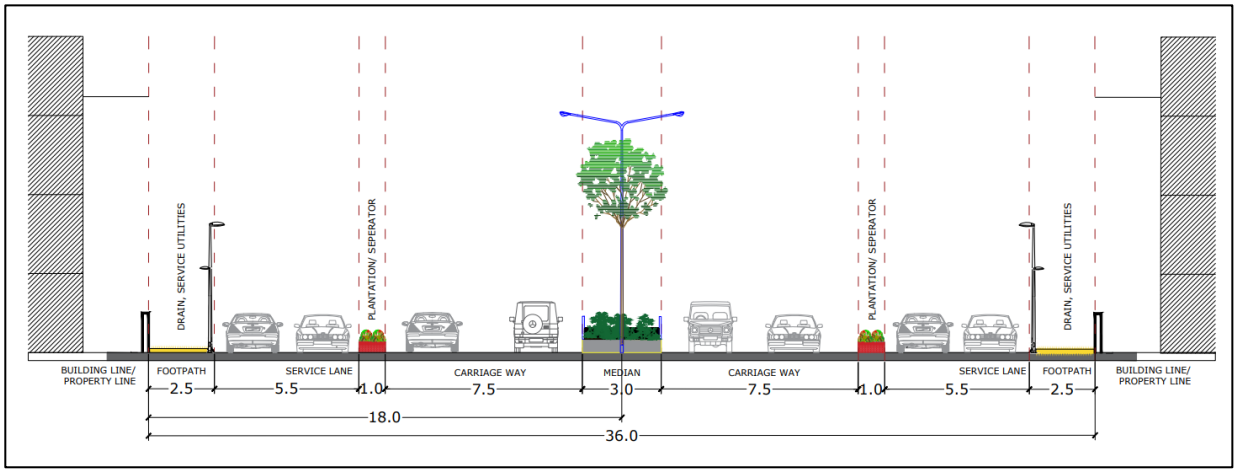


FIGURE 4.15: TYPICAL CROSS-SECTION FOR 30 M ROW

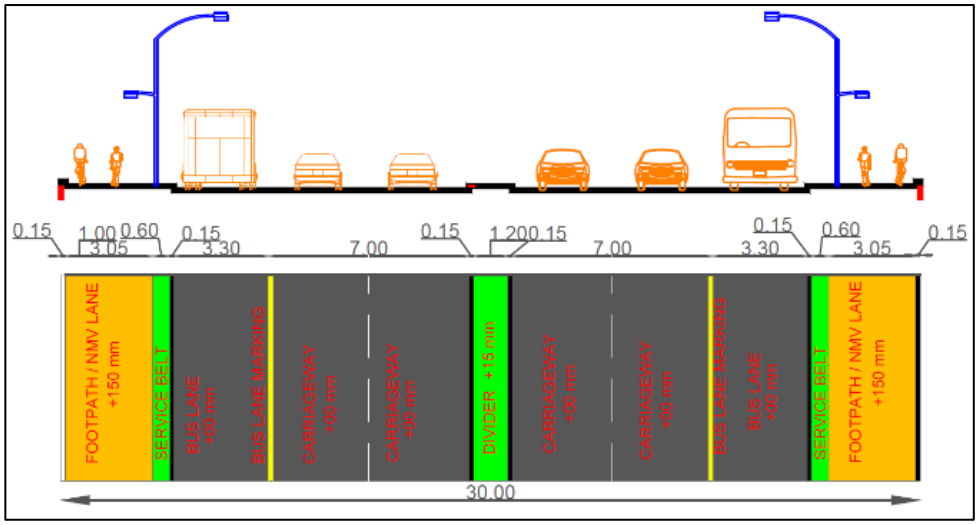


FIGURE 4.16: TYPICAL CROSS-SECTION FOR 18 M ROW

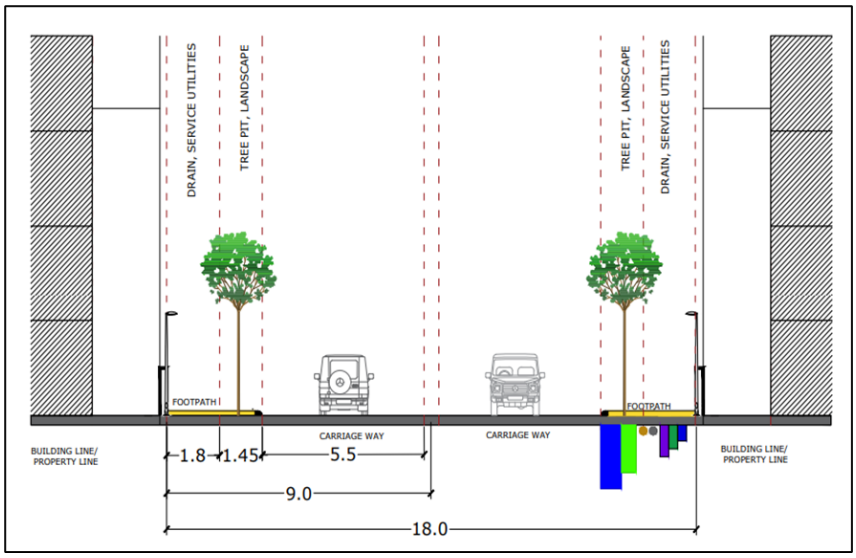


FIGURE 4.17: TYPICAL CROSS-SECTION FOR 12 M ROW

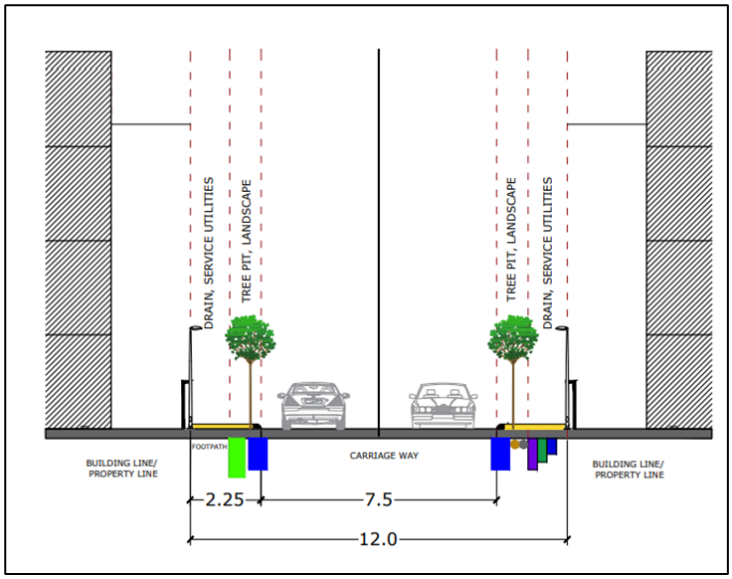
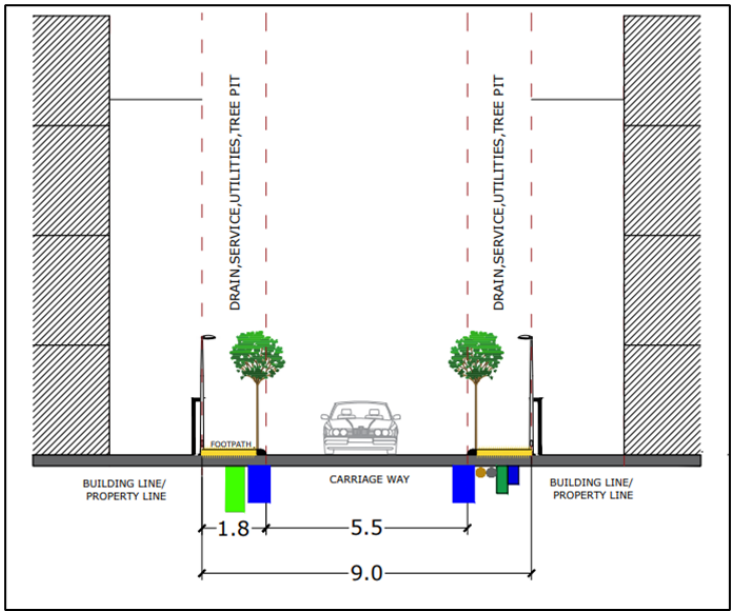


FIGURE 4.18: TYPICAL CROSS-SECTION FOR 9 M ROW



4.3.3. Proposals for Road Widening

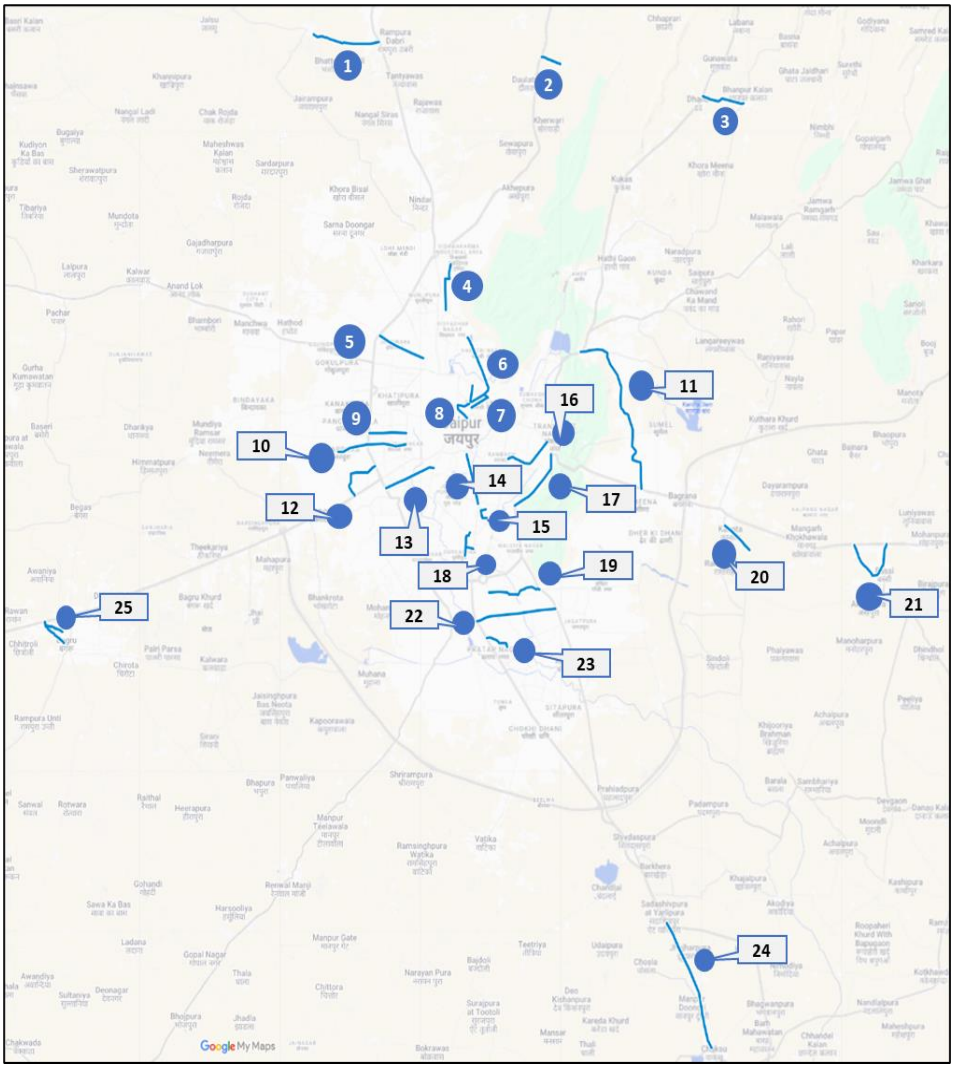
To address capacity constraints, improve traffic operations, and enhance overall road safety in Jaipur and improve regional connectivity, several roads are proposed for widening. The widening interventions are primarily proposed along critical links where existing right-of-way is inadequate to accommodate present and projected traffic demand. These interventions are aimed at reducing congestion, improving travel speeds, and ensuring safer movement for all road users, while minimizing land acquisition and avoiding adverse impacts on the surrounding built environment. The proposed road widening works are intended to complement other planned transport infrastructure improvements and strengthen the overall road network efficiency. The proposals are tabulated **TABLE 4.7** and shown in the **FIGURE 4.19** below.

TABLE 4.7: PROPOSED WIDENING OF ROADS IN JAIPUR CITY

S. NO.	PROPOSED ROADS FOR WIDENING	LENGTH OF ROAD (KM)
1	Rampura Dabri to Jahota (2 Lane to 4 Lane)	4.3
2	Bagwara (2 Lane to 4 Lane)	1.5
3	Dhand to Bhanpur Kalan (2 Lane to 4 Lane)	2.8
4	VKIA (Internal Roads)	3.0
5	Jhotwara (2 Lane to 4 Lane)	3.0
6	Vidhyadhar to Sikar House (2/4 Lane to 4/6 Lane)	3.5
7	Collectorate (Shiv Marg, Madho Singh Rd. Kanti Chandra Rd) (2 Lane to 4 Lane)	3.5

S. NO.	PROPOSED ROADS FOR WIDENING	LENGTH OF ROAD (KM)
8	Station to Collectorate (2 Lane to 4 Lane)	1.8
9	Amrapali Circle (2 Lane to 4 Lane Divided)	2.5
10	Lalpura to Vijay Dwar (2/4 Lane to 4 Lane Divided)	4.5
11	Jaisinghpura to Bawadi (2 Lane to 4 Lane)	10.2
12	Heerapura (2 Lane to 4 Lane)	3.0
13	Janpath (2 Lane to 4 Lane Divided)	3.2
14	Gandhinagar to 22 Godam (Service Road Wide)	2.8
15	Gandhinagar Station (2 Lane to 4 Lane)	1.0
16	Govind Marg (2/4 Lane to 4 Lane Divided)	3.0
17	Rotary To GTB (2 Lane to 4 Lane Divided)	4.0
18	Mahaveer Nagar (Durgapura Stn Rd Widening)	2.0
19	Jagatpura (Station Road Widening)	3.5
20	Dudawala (Internal Roads)	2.0
21	Bassi (Stn Road) (2 Lane to 4 Lane Divided)	4.5
22	Airport Terminal 1 (2 Lane to 4 Lane Divided)	5.0
23	Pinjrapol (Internal Rd) (2 Lane to 4 Lane)	1.5
24	Chaksu (2 Lane to 4 Lane Divided)	7.5
25	Bagru (Internal Roads)	3.0
TOTAL LENGTH OF NETWORK (IN KMS)		**86.6**

FIGURE 4.19: PROPOSED WIDENING OF ROADS IN JAIPUR CITY



4.3.4. Proposed Rail Over Bridge/Rail under Bridge

Jaipur's rail network intersects with several key road corridors, and the presence of level crossings often disrupts smooth traffic movement. To ensure uninterrupted flow and improve overall service levels, Rail Over Bridges (RoBs)/ Rail Under Bridges (RuBs) have been proposed at 9 major locations across the city. These facilities will significantly reduce congestion caused by frequent closures at manned level crossings and enhance safety and travel reliability.

These ROBs/RUBs will play a critical role in easing traffic congestion along major corridors of the city, while also ensuring seamless regional connectivity. The list of proposed locations is summarized in **TABLE 4.8** and mapped in **FIGURE 4.20.**

TABLE 4.8 PROPOSED RAIL OVER/UNDER BRIDGES IN JAIPUR

S. NO.	NAME OF LOCATION	LC NUMBER	PROPOSED ROB/RUB
1	Kanakpura Crossing (Gokulpura)	229	Rail under Bridge (RuB)
2	Govindpura Sirsi Crossing	231	Rail over Bridge (RoB)
3	Hathoj Crossing	232	Rail over Bridge (RoB)
4	Bindayaka Crossing	232	Rail under Bridge (RuB)
5	Shinvad Crossing	234	Rail over Bridge (RoB)
6	Kartarpura Crossing	84	Rail under Bridge (RuB)
7	Mahesh Nagar Crossing	82X	Rail under Bridge (RuB)
8	Jagatpura Crossing	215	Rail under Bridge (RuB)
9	Kalabard Crossing	72	Rail over Bridge (RoB)

FIGURE 4.20 PROPOSED RAIL OVER/UNDER BRIDGES IN JAIPUR



4.4. NON-MOTORISED TRANSPORT IMPROVEMENT PLAN

NMT and pedestrian infrastructure are fundamental components of sustainable transport for Jaipur. The development of NMT facilities is proposed as an integral part of the city's overall road development and mobility improvement program. To promote NMT usage, priority must be accorded to pedestrian and Non-Motorized Vehicle (NMV) safety, which can be achieved through effective segregation from motorized traffic.

In Jaipur, footpaths are not present on all the major arterial roads where high pedestrian footfall is observed, and wherever available, they are often underutilized. The discontinuity of footpaths at frequent intervals—caused by encroachments, design deficiencies, utility obstructions, and deterioration—makes them inconvenient and unsafe for regular use. Similarly, NMV lanes/ cycle tracks are completely absent in the network.

To improve the NMT scenario in Jaipur, it is crucial not only to increase the coverage and connectivity of pedestrian and NMV facilities, but also to ensure their continuity, accessibility, and regular upkeep. This will enhance safety, promote walking and cycling, and contribute to a more inclusive and sustainable mobility system in the city.

The proposals under Non-Motorized Transport (NMT) Improvement Plan are:

- Development of Footpaths
- Providing Foot over Bridges (FOBs)
- Development of cycle lanes
- Public bike sharing scheme
- At grade Pedestrian Crossing Facilities

4.4.1. Proposed Footpath Network

Pedestrian excursions are often brief and may be found throughout a city. As a result, pedestrian walkways should ideally be provided on all main arterial roads and streets. However, pedestrians should be given extra care around crossings (dangerous intersections), and significant activity hubs (like schools, colleges, etc.). The design of the city's footpaths should be consistent. The city requires pathways with a minimum width of 1.8 m. For higher footfall areas (commercial/transport hubs) the minimum width of footpath shall be 4.0 m.

Jaipur being city having higher pedestrian footfall, shall consider the following for footpath:

- Minimum width of footpath in Residential Streets / Local Roads must be 1.8 m.
- Minimum width of footpath in Collector Roads / Secondary Arterials must be 2.5m.

- Minimum width of footpath in Major Arterials / Commercial Corridors must be 3.0 m.

Following measures are recommended for pedestrian infrastructure:

- Provision for street furniture, vending zones, trees/landscaping, and utilities should be planned without obstructing the minimum clear width.
- Regular maintenance and encroachment management is essential to ensure usability.
- Footpaths should be provided on both sides of the road.
- Footpaths wherever discontinued, to be raised by tabletop crossing.
- Strict enforcement to restrict motorized vehicles from entering footpaths.
- All roads with medians to have rail guards to discourage jaywalking along with opening at every 1 km distance to allow pedestrians to cross with a pedestrian crossing signal as a minimum requirement.
- Zebra crossings to be provided at all junctions.

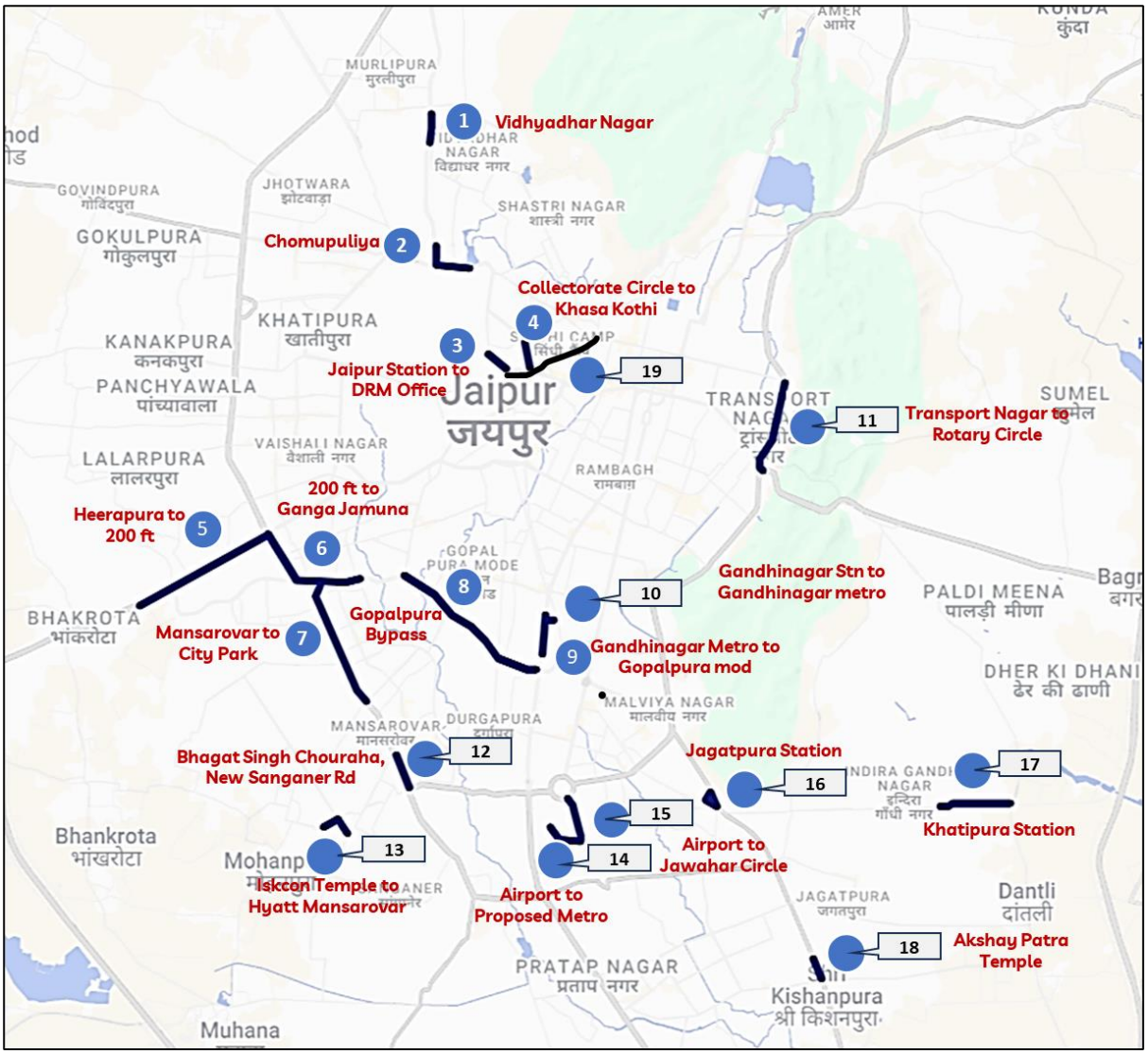
A total network of about 26 Km has been proposed for the development of footpaths. The proposed road sections for development of footpaths are presented in **TABLE 4.9** and **FIGURE 4.21** below.

TABLE 4.9: PROPOSED FOOTPATH NETWORK IN JAIPUR

S. NO.	PROPOSED FOOTPATH	LENGTH (KM)
1	Vidhyadhar Nagar (Metro to Bus Terminal)	0.6
2	Chomupuliya Metro to Bhawani Niketan	0.7
3	Jaipur Station to DRM office	0.5
4	Collectorate Circle to Khasa Kothi	0.5
5	Heerapura Bus Stand to 200 ft Ajmer Junction	3.0
6	200 ft Ajmer Junction to Ganga Jamuna Junction	2.5
7	Mansarovar to LJC Junction (City Park)	2.8
8	Gujjar ki Thadi to Gopalpura Chouraha	3.8
9	Gandhinagar Metro to Gopalpura mod bus stop	0.9
10	Gandhinagar Station to Gandhinagar metro	0.2
11	Transport Nagar to Rotary Circle	2.0
12	Bhagat Singh Chouraha to Vijay Path Stop	0.7
13	Iskcon Temple to Hyatt Mansarovar	0.8
14	Airport to Proposed Metro	0.7
15	Airport to Jawahar Circle	1.0

S. NO.	PROPOSED FOOTPATH	LENGTH (KM)
16	Jagatpura Station to JTM Mall	0.8
17	Khatipura Station	1.5
18	Akshay Patra Temple	0.5
19	Station to Chandpole	2.0
	TOTAL NETWORK LENGTH	**25.5**

FIGURE 4.21: PROPOSED FOOTPATH NETWORK IN JAIPUR



4.4.2. Development of NMV lanes

Cycling is becoming more widely acknowledged as a clean, sustainable form of transportation and an important component of a multi-modal transportation strategy for sustainable urban travel. More cycling in metropolitan areas instead of driving might result in lower energy usage and less traffic congestion. Increasing cycling as a mode of

transportation might be a viable method to help reduce greenhouse gases and other emissions. The construction of cycle tracks should entice more disinterested persons to use bikes for transportation rather than only catching captive customers.

The following concepts are used to create bicycle-friendly streets:

- **Safety**: Separated cycling lanes provide a sense of security and provide a secure route to schools and bus stations.
- **Connectivity**: The NMT network should link important attractions and provide a seamless network with fewer gaps.
- **Convenience**: A more pleasant pedestrian and cycling path with amenities to encourage and support the usage of NMT.
- **Ambience**: To provide riders with a pleasurable and enjoyable riding experience.

The minimum required width for NMV lanes varies but generally lies between 2.5 to 3 metres. The types of NMV lanes recommended for any urban road presented in **FIGURE 4.22**.

As per the traffic data analysis, the share of NMV traffic is very low in the city because NMV infrastructure is completely absent in the city. In line with the objectives of CMP, the share of NMV traffic is to be increased to promote sustainable development. IRC also recommends that NMV lane (cycle track) should be an integral part of the road. NMV lanes have been proposed along those road sections of industrial areas where a substantial share of NMT has been observed. The proposed NMV lanes will benefit the industrial areas along Mansarovar and Sitapura as well as the institutional area near MNIT.

NMV lanes (Type III) have been proposed with total length of about 16 Km. The locations for proposed NMV lanes are presented in **TABLE 4.10** below. The map showing the proposed NMV network is shown in **FIGURE 4.23**.

TABLE 4.10: PROPOSED LOCATIONS FOR DEVELOPMENT OF NMV LANES IN JAIPUR

S. NO.	PROPOSED LOCATION	LENGTH (IN KM)
1	Mansarovar Industrial Area	1.5
2	Sitapura Industrial Area	10.5
3	MNIT Institutional Area (along service road)	4.0
	Total	**16.0**

FIGURE 4.22 TYPES OF NMV LANES

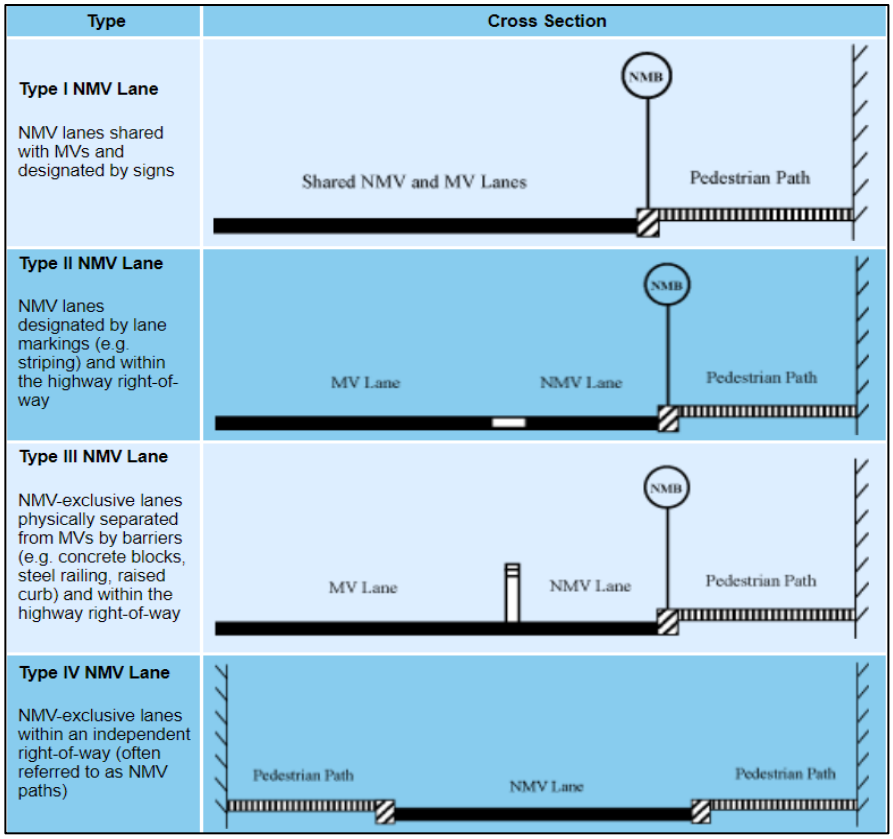
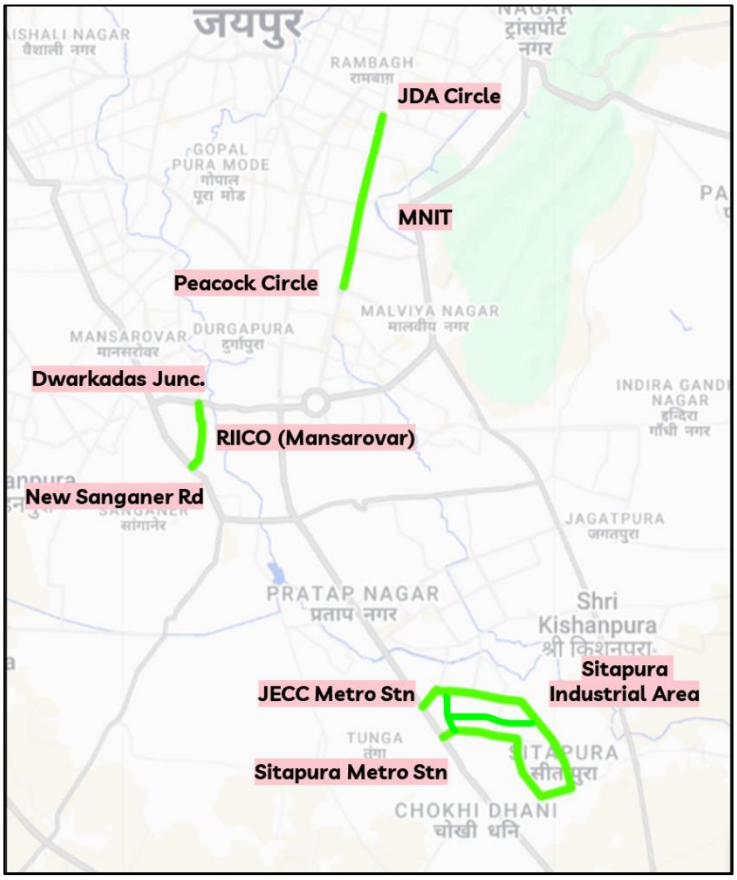


FIGURE 4.23: PROPOSED NMV LANES IN JAIPUR



4.4.3. Proposed Pedestrian Crossing Facilities

To facilitate pedestrian movement, Grade separated pedestrian crossing facilities must be located on mobility corridors and near pedestrian intensive land uses. The pedestrian crossing demand has been estimated based on pedestrian volume surveys carried out in the study. The identified locations for grade separated pedestrian facilities (Foot Over Bridge/Subway) is presented in **TABLE 4.11**, **FIGURE** 4.24.

FIGURE 4.24: PROPOSED GRADE SEPARATED PEDESTRIAN CROSSING FACILITIES

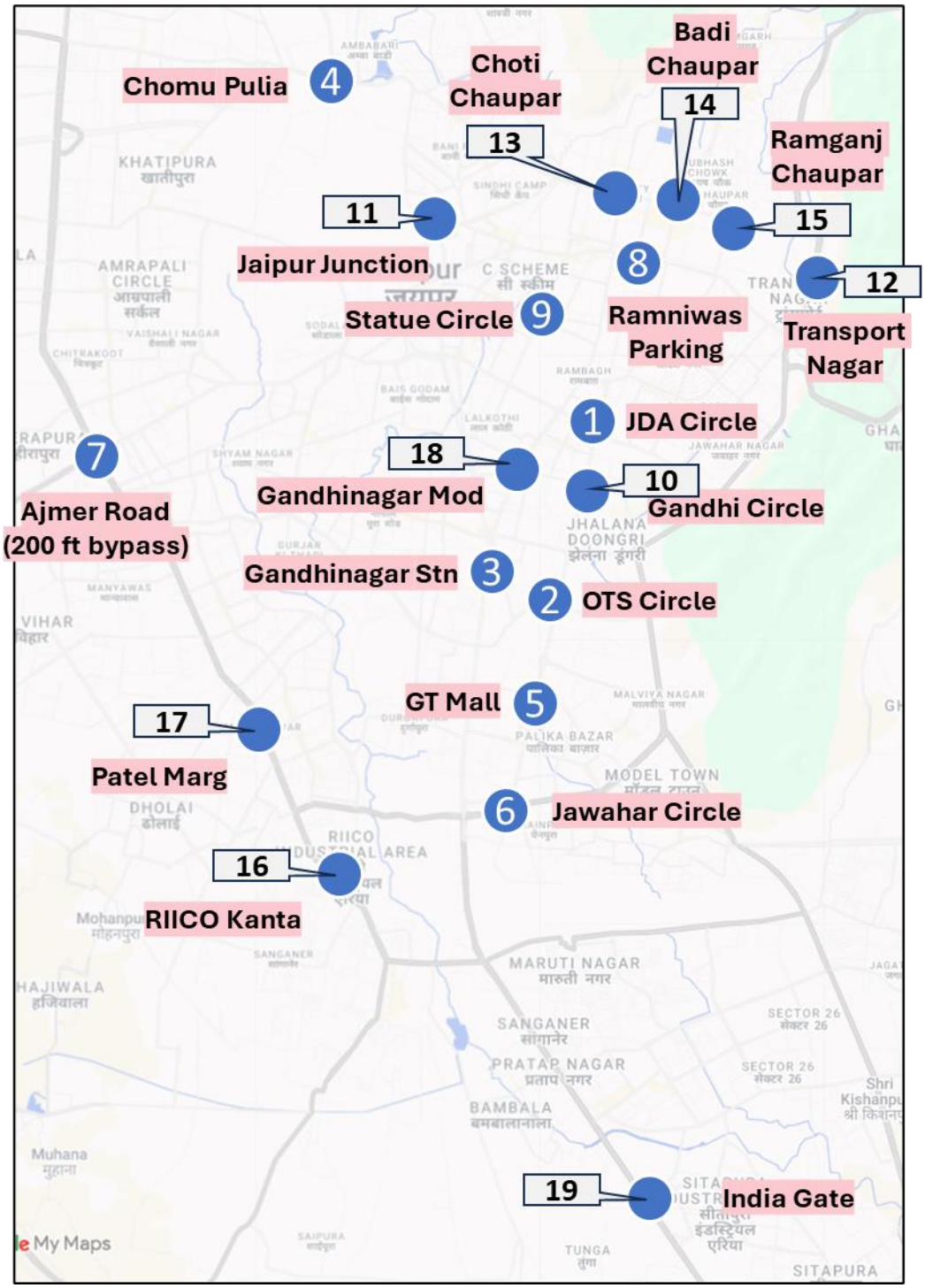


TABLE 4.11: PROPOSED GRADE SEPARATED PEDESTRIAN CROSSING FACILITIES

S. NO.	PROPOSED LOCATION	REMARKS
1	JDA Circle	FOB on arms along JLN Marg
2	OTS Circle (MNIT)	FOB on arms along JLN Marg
3	Gandhinagar Railway Station	FOB from Gandhinagar Station to proposed metro station
4	Chomu Pulia	Subway at Chomu Pulia
5	GT Mall	FOB across JLN Marg
6	Jawahar Circle (Patrika Gate)	FOB in front of Patrika Gate
7	Ajmer Road (200ft bypass)	FOB on arm towards Tagore Nagar
8	MI Road near Ramniwas Bagh Parking	FOB across MI Road
9	Statue Circle	FOB on arms along Bhagwan Das Road
10	Gandhi Circle	FOB on arms along JLN Marg
11	Jaipur Junction Rly Station	FOB from Jaipur Station to Metro station
12	Transport Nagar	FOB across NH248
13	Choti Chaupar	Skywalk connecting all the Arms
14	Badi Chaupar	Skywalk connecting all the Arms
15	Ramganj Chaupar	Skywalk connecting all the Arms
16	RIICO Kanta Chauraha	FOB across New Sanganer Road
17	Patel Marg, New Sanganer Road	FOB across Jaipur-Jodhpur Road
18	Gandhi Nagar mod	FOB across Sawai Mansingh Road
19	India Gate, Sitapura	FOB across Jaipur-Kota Road

To ensure safe and convenient movement of pedestrians across major intersections in Jaipur, dedicated pedestrian crossing facilities are proposed at all key junctions. These facilities will include well-marked zebra crossings, pedestrian refuge islands on wider roads, and traffic signal with pelican signal phase. The design shall prioritize universal accessibility through provision of ramps, tactile paving for visually impaired users, and adequate lighting for safety. By integrating pedestrian crossings with overall junction improvement plans, conflicts with vehicular traffic will be minimized, thereby enhancing walkability and promoting a pedestrian-friendly urban environment.

The following recommendations have been given based on the PV^2 analysis:

- Provision of zebra crossings at locations with moderate pedestrian and vehicular volumes,
- Installation of pedestrian signals at higher pedestrian–vehicle conflict points,

- Grade-separated facilities such as Foot Over Bridges or subways at junctions where the PV^2 values exceed the warrant thresholds for safe at-grade movement.

Threshold Values for Pedestrian Crossing Treatments (PV^2 Method) are shown in **TABLE 4.12** below:

TABLE 4.12: THRESHOLD VALUES FOR PEDESTRIAN CROSSING USING PV^2 METHOD

CROSSING FACILITY	PV^2 VALUE RANGES*			
	2-LANE 2-WAY	3-LANE 2-WAY	4-LANE 2-WAY	6-LANE 2-WAY
No Facility	$< 4.2 \times 10^8$	$< 8.5 \times 10^8$	$< 2.5 \times 10^9$	$< 5.6 \times 10^9$
Zebra Crossing	$4.2 \times 10^8 – 3.0 \times 10^9$	$8.5 \times 10^8 – 6.5 \times 10^9$	$2.5 \times 10^9 – 2.05 \times 10^{10}$	$5.6 \times 10^9 – 4.8 \times 10^{10}$
Pedestrian Signal	$3.0 \times 10^9 – 2.1 \times 10^{10}$	$6.5 \times 10^9 – 4.9 \times 10^{10}$	$2.05 \times 10^{10} – 1.6 \times 10^{11}$	$4.8 \times 10^{10} – 4.1 \times 10^{11}$
Grade Separated	$> 2.1 \times 10^{10}$	$> 4.9 \times 10^{10}$	$> 1.6 \times 10^{11}$	$> 4.1 \times 10^{11}$

* Where 'P' is the Peak Hour Pedestrian Flow & 'V' is the Peak Hour Vehicle Flow of both direction

The recommendations for pedestrian crossing facilities at the identified junctions, based on PV^2 analysis, are presented in the following **TABLE 4.13.**

TABLE 4.13: PEDESTRIAN CROSSING RECOMMENDATIONS FOR IDENTIFIED JUNCTIONS

S. NO.	NAME OF LOCATION	PEAK HOUR PEDESTRIAN ACROSS VOLUME	RECOMMENDATIONS FOR PEDESTRIAN CROSSING
1.	Chandpole	263	Zebra Crossing
2.	Rotary (Transport) Circle	137	Zebra Crossing
3.	Chomu Puliya	1239	Pedestrian Signal
4.	Narayan Singh Circle	969	Pedestrian Signal
5.	200ft Bypass Chowk	761	Pedestrian Signal
6.	Haldi Ghati Junction	1120	Zebra Crossing
7.	Ajmeri Gate	1366	Pedestrian Signal
8.	Collectorate Circle	769	Pedestrian Signal
9.	Sahkar Bhawan Circle	856	Zebra Crossing
10.	Hawa Sadak Road	1138	Pedestrian Signal
11.	Apex Circle	1354	Zebra Crossing
12.	Sanganer Junction	2030	Pedestrian Signal

4.4.4. Public E-BIKE Sharing (PBS)

Public Bike Sharing (PBS) is a high-quality bicycle based public transport system in which bicycles, stored in a closely spaced network of stations, are made available for short-term shared use. Bicycle sharing programs involve installing multiple bicycle stations at several different key locations. A user checks-out the bicycle from one location, rides to his or her destination, and drops the bicycle to another location. The operators coordinate the redistribution of bicycles and ensure availability of cycles at locations with the highest demand at any given time."

Public Bicycle Sharing (PBS) is slowly emerging as one of the most sustainable, popular and attractive public transport modes throughout the world. This mode offers the conveniences of both public and personal modes. It enables public access to personal bicycles, offering maximum flexibility with minimum liability.

a. Objectives For E-Bike Sharing Scheme

- To provide affordable last-mile connectivity options for public transit systems.
- To connect all the trip's origins and destinations to public transit systems via e-bike sharing.

The benefits of E-Bike sharing are listed below:

- It encourages equitable distribution of infrastructure to all the citizens and users of the city.
- It mobilizes not only the movement but also the improved health conditions of the end users in terms of mental and physical well-being of the community.
- It also helps in creating the balance and harmony of a healthy environment for the city by mitigating the climate change response.
- It boosts end user's safety throughout the trip by making it more viable against a motorized vehicle to avoid collisions and damage.
- It requires cheaper and affordable interventions in terms of infrastructure alignment. Also, it is easy to operate, maintain and monitor for longer generations. Thus, providing economic value.
- Overall, it benefits citizens and makes the journey more enjoyable. Thus, benefiting the city in terms of providing ideal quality of life.

b. Components of E-Bike Sharing Scheme

For Jaipur, 4th Generation e-Bike Sharing system is proposed. Some of the inherent characteristics of this kind of system and their benefits are mentioned in **TABLE 4.14**.

TABLE 4.14: PBS INFRASTRUCTURE CHARACTERISTICS

INFRASTRUCTURE	CHARACTERISTICS	BENEFITS
e-bikes	e-Bikes with pedal assistance, GPS tracker.	Optimum system cost, low theft, low maintenance
Docking Stations	e-Bike parking facility with charging terminal and advertisement boards	Low cost, low maintenance, easy installation
GPS Tracking	Geo-fencing integrated with Operations Control Centre	Smooth Operations
Mobile Application and Website	Easy access to the system through the application and website	Easy outreach, User friendly
Vehicle Transfer and balancing	Need of transfer reduces, and rides can be started and stopped anywhere within the geofencing boundary. Only a small transfer vehicle for emergency maintenance is required.	Reduced cost

i. **E-Bikes-** The main component of the Public e-Bike Sharing System is the e-Bikes. While the original design of the e-Bikes shall depend on the vendor specifications, some important considerations for selecting the suitable specifications are-

- It should be a unisex model
- It should be aquipped with a GPS and RFID tag
- It should have internal hub gears with different speeds
- It should have internal hub brakes & enclosed chain
- It should have adjustable seat & mudguards
- It should have reflective strips on wheels and behind the vehicle, rear view mirror, front and rear lights and a bell for increased visibility
- It can also have a water bottle holder, handlebar mounted basket for convenience

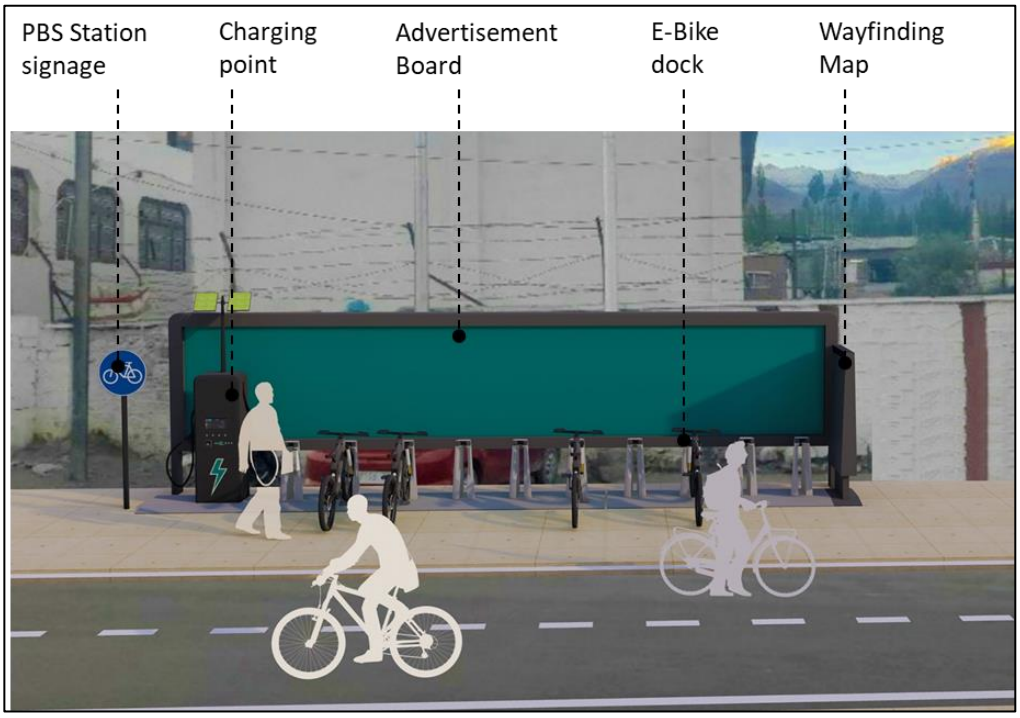
ii. **GPS and Smart Locks:** e-bikes are equipped with GPS technology and smart locks. The GPS enables the bikes to be tracked, and the smart lock allows users to unlock and lock the bikes using the app.

FIGURE 4.25: SAMPLE OF PROPOSED E-BIKES



iii. **e-Bike Docking Station-** While 4th Generation e-Bikes do not require a docking station, it is pertinent to have designated space for docking e-Bike. This is important to ensure that e-Bikes are not left around carelessly, otherwise it might create traffic nuisance. Moreover, if the system is operated through a private operator, designated space would be essential. The docking stations would be marked on the PBS mobile application's map. The design of a typical dock and its component parts are shown in **FIGURE 4.26.**

FIGURE 4.26: TYPICAL DESIGN OF A PBS DOCKING STATION



iv. **e-Bike Transfer/ Distribution System –** The 4th Generation PBS system does not require frequent transfer of vehicles as each vehicle can be located on the mobile application on real time basis.

v. **Operation and Maintenance-** The e-Bike operators have a team of technicians who regularly monitor and maintain the fleet. When a particular e-bike get discharged or is low on battery, the technicians receive a notification to collect the bike and charge it. Typically, the process of transporting and charging the e-bikes involves the following steps:

- **Bike collection:** Operator's technicians use electric vehicles or other suitable means of transportation to collect the bikes that require charging. They may pick up multiple bikes at a time to optimize efficiency.
- **Battery swapping or plug-in charging:** depending on the bike model, the operator may also use a battery swapping mechanism or plug-in charging to recharge the bikes.

- **Redistribution:** once the bikes are fully charged, the technicians redistribute them back to popular or high-demand areas, ensuring that users can easily find available bikes in their vicinity.
- **Maintenance:** Each e-bike would undergo frequent maintenance checks along with replacement of parts as per need. In case any e-bike is damaged, it would have to be replaced by a new one.

vi. **Mobile App:** e-Bike users would be required to locate and rent e-bikes through a mobile application. It provides real-time information on the availability of nearby bikes and allows users to unlock the bikes for use.

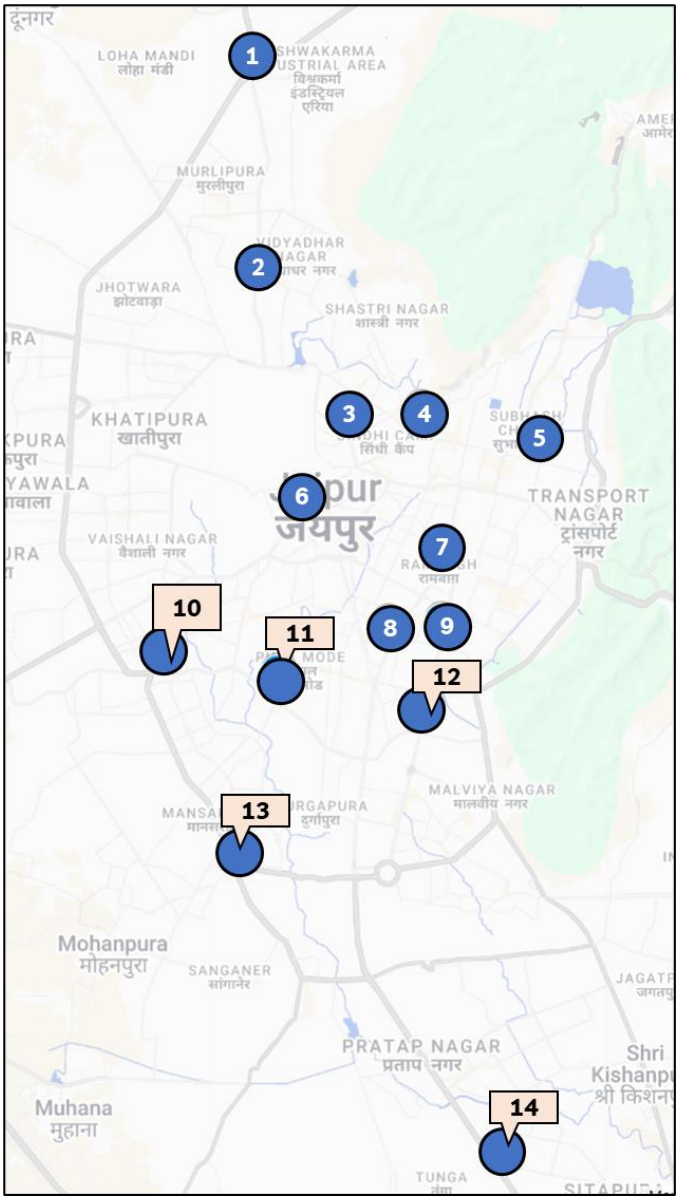
vii. **Geofencing:** To ensure responsible parking and discourage users from leaving bikes in inappropriate or obstructive locations, e-Bikes would be having the geofencing technology. Geofencing sets virtual boundaries around designated parking zones, and users may receive reminders or incentives to park within these boundaries.

PBS scheme provides last mile connectivity as well as eco-friendly travel options to the Metro users. The short trip lengths in the city can be greatly served by a new system of bicycle sharing. For that purpose, the existing and proposed metro stations and institutional and industrial areas have been identified for establishing primary docking stations. The proposed locations for PBS Docking stations are presented in **TABLE 4.15** and **FIGURE 4.27.**

TABLE 4.15: PROPOSED LOCATIONS FOR PBS DOCKING STATIONS

SN.	PROPOSED PBS DOCKING STATIONS
1	VKIA Rd 14 Metro station
2	Vidhyadhar Nagar Sec 2 Metro station
3	Collectorate Metro station
4	Chandpole Metro station
5	Civil Lines Metro station
6	Ramganj Choupar
7	Narayan Circle Metro station
8	Nehru Udhyan
9	Gandhi Circle
10	Mansarovar Metro station
11	Riddhi Siddhi Circle
12	MNIT Circle (OTS Circle)
13	Bhagat Singh Chauraha, New Sanganer Road
14	Sitapura Metro station

FIGURE 4.27 LOCATIONS OF PROPOSED PBS DOCKING STATIONS



4.5. "INTER-MODALITY" - INTEGRATED DEVELOPMENT OF ALL MODES INCLUDING NON-MOTORISED TRANSPORT

Inter-modal integration explores the coordinated use of two or more modes of transport for efficient, speedy, safe, pleasant and comfortable movement of passengers in urban areas. It provides convenient and economical connection of various modes to make complete journey from origin to destination. The concept of inter-modal integration with the modes is to provide last mile connectivity to the commuters.

All the proposals given under the Public Transport Improvement Plan i.e. Bus system, Para transit system have been proposed to be integrated with each other for efficient passenger movement. The proposals of NMT have also been integrated with other motorized modes.

4.6. FREIGHT MOVEMENT PLAN

4.6.1. Freight Flow Corridors in Jaipur

Jaipur serves as a major urban center in the economic framework of Northern India, characterized by a steadily expanding industrial base and a growing service sector. Its strategic location along the Delhi–Mumbai Industrial Corridor (DMIC), coupled with its proximity to the Western Dedicated Freight Corridor (DFC), significantly enhances the city's freight distribution capabilities and overall logistical connectivity. Jaipur sits at the intersection of regional, national, and international trade flows, acting as a logistics hub between Delhi NCR, Gujarat ports, and central/southern India. The details of major freight corridors in Jaipur are presented in **TABLE 4.16**.

TABLE 4.16 MAJOR FREIGHT CORRIDORS PASSING THROUGH OR AROUND JAIPUR

CORRIDOR	ROUTE	ROLE IN FREIGHT MOVEMENT
NH-48 (Old NH-8)	Connects Delhi to Mumbai via Jaipur	Forms part of the Golden Quadrilateral; a key freight artery linking Jaipur to major metros and ports
NH-52	Runs from Sangrur (Punjab) to Ankola (Karnataka), passing through Jaipur	Connects Jaipur to central India, critical for cement, food, FMCG, facilitates north–south freight movement; intersects with NH 48, enhancing multimodal logistics potential
NH-21	Connects Jaipur to Bareilly (U.P.) via Dausa and Bharatpur	Connects to eastern Rajasthan and UP, handles perishable/agro freight, Supports regional freight distribution and links Jaipur to eastern and northern hinterlands
Jaipur Ring Road	Six-lane expressway Intercepts NH-52, NH-48, NH-21	Bypass for long-haul freight avoiding city center
Delhi–Mumbai Industrial Corridor (DMIC)	Integrated development initiative with industrial zones, logistics hubs, and connectivity improvements between Delhi and Mumbai	Strategic freight zone with future multimodal terminals planned
Western Dedicated Freight Corridor (WDFC)	High-capacity freight corridor from Dadri (U.P.) to JNPT (Maharashtra), designed for rapid, efficient goods movement	Passes near Jaipur, boosting regional logistics and freight handling capabilities
Bharatmala Economic Corridors	Includes routes like Paniyala–Alwar–Barodameo Highway near Jaipur	Aimed at improving freight efficiency through economic corridors and feeder routes, improving regional access and freight flow

4.6.2. Production and Industrial Hubs in the City

Jaipur has a mix of traditional clusters (e.g., handicrafts, marble) and modern industrial zones (e.g., SEZs, EPIPs). (**TABLE 4.17**)

TABLE 4.17 MAJOR INDUSTRIAL CLUSTERS & ECONOMIC NODES

INDUSTRIAL HUB	KEY FEATURES	ECONOMIC SIGNIFICANCE
Mahindra World City (SEZ)	3,000-acre multi-product Special Economic Zone on NH-8 (Jaipur–Ajmer Highway)	Major hub for manufacturing, IT, and logistics; attracts global and domestic investments
Sitapura Industrial Area	Located in southern Jaipur; hosts pharma, textiles, and engineering units	One of the oldest and most developed industrial zones; strong export-oriented base
Vishwakarma Industrial Area	Northern Jaipur; home to engineering, electronics, and auto component industries	Dense cluster of MSMEs and large-scale units; significant employment generator
Bagru Industrial Area	Situated on Jaipur–Ajmer Road; mix of industrial, commercial, and residential zones	Known for traditional textile printing and emerging manufacturing units
Bindayaka Industrial Area	Located on Sirsi Road; includes plastics, pipes, and light engineering industries	Supports Jaipur's growing demand for infrastructure and construction materials
Solitaire Industrial Park	NH-8 corridor; developed by KGK Infra Group	Focus on sustainable and modern industrial development; caters to diverse business needs
Sanganer	Famous for hand block printing and handmade paper industries	Major hub for traditional crafts and small-scale manufacturing
Prahladpur Industrial Area	Small-medium scale industrial hub near Delhi Road. Close to wholesale and construction material markets.	Key for inbound logistics from Delhi side. Supports SMEs in warehousing and construction-related trade.
Mansarovar (RIICO Industrial Area)	Situated along New Sanganer Road; includes 292 RIICO plots over 109 acres	Known for garments, automobiles, IT, and warehousing; high demand for industrial leasing
Kanota	Located on Jaipur–Agra Road; emerging as a logistics and warehousing zone	Proximity to eastern freight routes; potential for logistics and agro-processing units
Kalwar	Located on Kalwar Road; mix of residential and light industrial development	Growing interest in warehousing and small-scale manufacturing
RIICO Industrial Areas (General)	Spread across Jaipur including Sitapura, VKI, Bagru, and Mansarovar	Backbone of Jaipur's industrial ecosystem; supports sectors like textiles, engineering, IT

4.6.3. Logistics Infrastructure Mapping in the City

The details of Truck terminals, parking yards, warehousing, rail based freight terminals, wholesale & commodity markets are presented in below **TABLE 4.18**, **TABLE 4.19**, **TABLE 4.20**, **TABLE 4.21**.

TABLE 4.18 DETAILS OF TRUCK TERMINALS AND PARKING YARDS

LOCATION	TYPE	DESCRIPTION	EXISTING CONDITION/ CONGESTION
Transport Nagar (Agra Road)	Truck Terminal	Major truck terminal with repair/loading facilities	High congestion due to inadequate access roads, poor internal circulation, and roadside encroachments. Lack of adequate parking facilities for trucks
Mansarovar Industrial Area	Parking & Loading	Temporary halts near industries	Moderate to high, on-street parking affects local traffic
VKIA (Vishwakarma Industrial Area)	Parking Yards	Lay-bys and loading areas	High, especially during peak hours due to mixed land use and lack of dedicated truck lanes
Sanganer Industrial Area	Parking	Mostly on-street truck parking	Moderate, worsens during peak industrial dispatch times

TABLE 4.19 DETAILS OF WAREHOUSING & COLD CHAIN

LOCATION	TYPE	DESCRIPTION	EXISTING CONDITION/ CONGESTION
Mahindra World City (Ajmer Road)	Large Warehousing	Integrated logistics with better infrastructure	Low, planned SEZ area with wide access roads
Bagru Industrial Area	Warehousing	Small-medium warehouses	Low to moderate, some congestion on NH access points
VKIA	Warehousing & Cold Chain	Storage for perishables and goods	High, warehousing trucks compete with industrial traffic
Sanganer & Sitapura	Cold Chain	Perishables, pharma, etc.	Moderate, limited last-mile infrastructure causes bottlenecks
Himmat Nagar (Tonk Road)	Private Warehouses	Mid-sized logistics hubs.	High, Tonk Road experiences frequent traffic jams due to mix of freight traffic with local traffic

TABLE 4.20 DETAILS OF RAIL BASED FREIGHT TERMINALS IN JAIPUR

LOCATION	STATION	FACILITIES	EXISTING CONDITION/ CONGESTION
Sanganer Railway Station	ICD (Proposed)	Freight terminal planned	Low currently, future risk of congestion if not planned with grade-separated access
Sambhar Lake / Phulera Junction	Freight Hub	Part of DFC network	Low, rural setting with ample space; future traffic will increase
Jaipur Junction	Minor Freight Sidings	Primarily passenger focus	Very High, city center location with severe access constraints
Kanakpura Railway Yard	Goods Yard	Basic freight handling	Moderate, localized congestion during freight movement

TABLE 4.21 DETAILS OF WHOLESALE AND COMMODITY MARKETS IN JAIPUR

LOCATION	MARKET TYPE	COMMODITIES	EXISTING CONDITION/ CONGESTION
Muhana Mandi	Fruits & Vegetables	Largest perishables hub.	Moderate to high, heavy truck movement during peak hours; entry/exit bottlenecks
Chandpole Market	Grocery/General Goods	Historic core trade area	Very High, narrow lanes, pedestrian-goods vehicle conflict
Chaura Rasta / Kishanpole	Textile Wholesale	Traditional trade hub	Very High, old city limitations on vehicle movement
Ramganj Market	Spices & Foodgrains	Dense trade zone	Very High, lacks loading bays and formalized freight hours.
Transport Nagar Godowns	FMCG, Hardware	Local distribution center	High, frequent truck stoppages and roadside operations

4.6.4. Proposed Freight Terminals

The presence of various RIICO industries and Kanakpura Dry Port results in generation of substantial amount of freight traffic. Further, Jaipur Region falls in between the busy corridor connecting Delhi and Mumbai. The timely and smooth movement of such freight is crucial to the well-being of the people and the viability of the economic activities they undertake. Considerable goods movement is observed along major highways like NH-48, NH-52, NH-21, NH-248, SH-12, SH-2C, and SH-55. However, the entry of heavy vehicles to the core city has been restricted during the daytime and is allowed only during late night hours (11 pm to 4 am).

Transport Nagar located on Agra Road is the only truck terminal in the study area due to which the on-street parking of trucks along the regional connectivity roads, bypass roads and along access roads of various industrial areas has aggregated over the years leading to traffic snarls and congestion. The roads that witness maximum on-street parking are Delhi Bypass, Tonk Road, Sikar Road, Gopalpura Bypass, Agra Road, Ajmer Road etc. only. Therefore, it is essential to develop truck terminals in the study area at the earliest.

There is an intermixing of freight and local traffic in the city. As an underlying principle, CMP proposes complete segregation of freight and local traffic by locating freight terminals at the periphery of the city (direction-oriented freight terminals). The truck terminal locations are proposed at the outskirts of the study area along the cordon roads so that the unnecessary truck movement for parking is avoided within major road network of the study area. Further, the truck terminals are proposed before the proposed ring road alignment so that the trucks can directly access the ring road without entering the core part of the study area.

The four locations have been proposed for the development of freight/ truck terminals. There is a proposal of Transport Nagar on Sikar Road near Todi which is in planning

stage by JDA. Apart from these, truck terminals have been proposed on Ajmer Road near Dahmi Kalan, Tonk Road near Prahladpura and Agra Road near Ring Road.

Freight terminals proposed at four locations (direction-oriented terminals), presented in **FIGURE 4.28**,are as follows:

- New Transport Nagar along Sikar Road near Todi (500 trucks on 15 Acre Land)
- Ajmer Road near Dahmi Kalan (500 trucks on 15 Acre Land)
- Tonk Road near Prahladpura (450 trucks on 12 Acre Land)
- Agra Road near RIICO Industrial Area (250 trucks on 7 Acre Land)

Retail and wholesale commercial activities are spread all over the core area. These activities need to be accessed not only by the buyers but also by the supply chain. Besides, the goods purchased also need to be moved from the core. The said processes require goods vehicles such as LCVs and Trucks to access the core area. As these vehicles need to be parked in and around core area, even after removal of on street parking of private vehicles, the problem of congestion will persist.

Thus, it is proposed here to restrict the entrance of Trucks in the core area during daytime i.e. from 7 a.m. to 11 p.m. All the goods transfer from and to the Core area shall be taken up during the night hours when passenger movement in the Core is minimal.

To manage freight efficiently and minimize traffic disruptions, provision of designated truck lay-bys is proposed. Truck lay-bys are planned at strategic locations along major arterial roads, city entry points, ring road corridors, and near industrial areas to facilitate short-term halting, rest, and compliance with time-based entry regulations. The lay-bys shall be designed as per applicable IRC guidelines, with adequate entry–exit tapers, pavement strength for heavy loads, lighting, signage, and basic amenities, while parking space planning shall follow URDPFI norms. The proposed lay-bys at New Transport Nagar, Kanakpura, Bagru, Mahindra SEZ are shown in **FIGURE 4.29.**

Goods transaction in Core during daytime is proposed to take place by IPT. The goods IPT vehicles will also pay on street and off-street parking charges. Though, a goods vehicle will not be allowed to be parked on the street for more than 2 hours duration. Long term goods IPT parking shall be only done on off street parking complexes.

FIGURE 4.28: PROPOSED FREIGHT TERMINALS IN JAIPUR

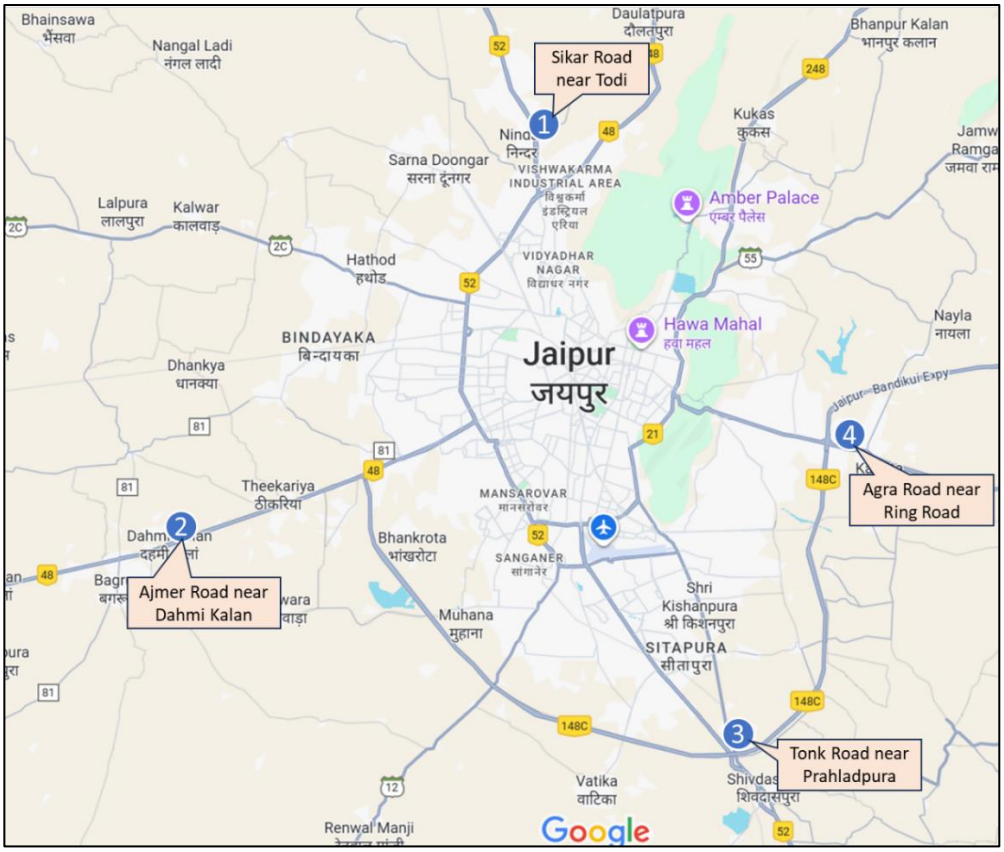
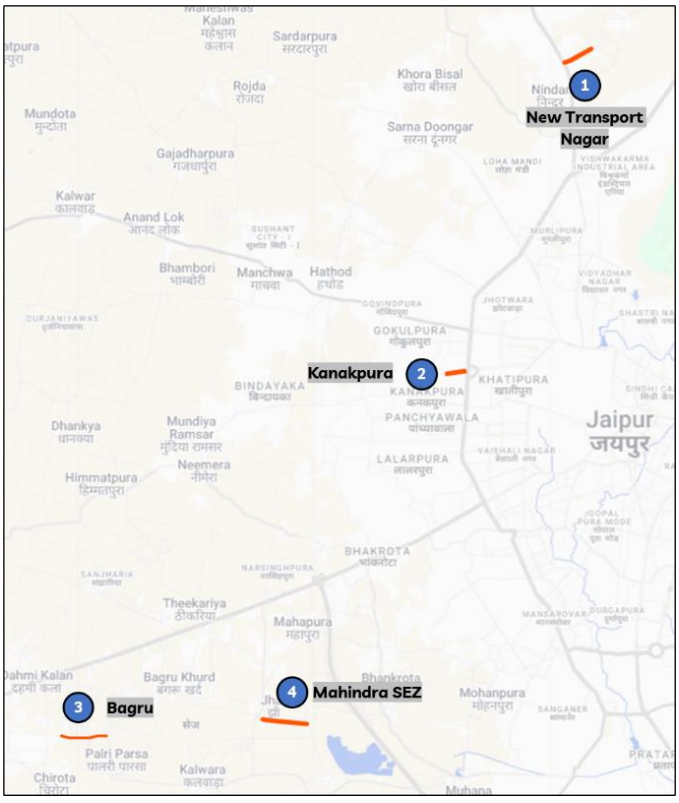


FIGURE 4.29: PROPOSED TRUCK LAY-BYES IN JAIPUR



4.7. INTELLIGENT TRANSPORT SYSTEM

4.7.1. Ticketing System

For better management and governance, pre-board and automated fare collection and verification are proposed. Smart Card is proposed along with the normal ticketing system.

4.7.2. Information System

Intelligent Transport System is proposed to be implemented with setting up of System Control Centers (SCC) for the same. ITS features such as traffic signaling, passenger information, fare collection and integration systems, operations control and communications to be in place and well-integrated. High-quality passenger information and audio announcements are proposed for the convenience of the passengers on buses and at stations. Bus stations proposed to have real-time next bus information displays. Passenger information is proposed to be centrally accessible to monitoring for better management (**FIGURE 4.30)**.

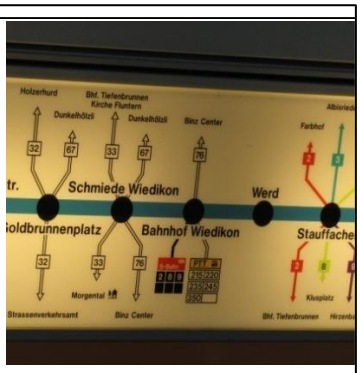
FIGURE 4.30: INFORMATION SYSTEM



Display for passenger information



Next-bus information



Route information

4.7.3. Intelligent Traffic Management System (ITMS)

Intelligent Traffic Management Systems (ITMS) apply a wide variety of technology tools to aid traffic management. ITMS measures typically aim to optimize the efficiency of the existing transport infrastructure, without having to resort to expensive infrastructure upgradation. It can open new ways of achieving sustainable mobility in this age of the information technology. ITMS tools are often deployed in combination with conventional (non-ITMS) traffic management measures.

Following are the key outcomes expected to be achieved by the proposed ITMS:

- Efficient traffic management
- Enhanced safety and security

- Better management of utilities and quantification of services
- Asset Management
- Improved visualization of ambient situation in the city and facilitation of data driven decision making

The critical sphere of ITS are given as under:

1. Automatic Fare Collection (AFCS) system

The proposed AFCS system consists of the following sub systems:

- Card Issuer Module
- AFCS backend sub-system
- Depot Stock Management System
- Point of Sale Terminal sub-system
- the interconnectivity between the above sub-systems
- Any other module which can be specified at a later stage

2. Validators (One per bus)

One Validator located at a suitable place inside a bus with a fire resistant wired interconnection is proposed in city buses. The Validators possess suitable nonvolatile memory for storing the captured AFC transactions as well as the fare structures and other necessary parameters.

3. Electronic Ticketing Machine (ETM)

The Electronic Ticketing Machine proposed will be used by the conductor on-board

- To issue paper tickets
- To validate Smart Cards for trip and passes and deduct money from the e-wallet of the AFCS card based on the concept of fare stages.

Further, the ETM possesses a GPRS interface for communication to the AFCS backend via a suitable service provider's infrastructure.

4. Security Access Modules (SAM)

In order to ensure the security of the transactions being captured, the ETM and Valida tor support the use of Security Access Modules (SAM) in slots for SIM cards.

5. Integrated Control Unit (ICU)

The primary function of the proposed ICU is to establish communication between the bus onboard AFCS equipment and the concerned backend equipment. It has the follo wing features:

- GPRS connectivity to connect to the AFCS backend through a suitable service provider's infrastructure
- USB port, as a backup, for communicating with a computer at the bus terminus/depot for uploading transactions and downloading new fare structures and other important parameters

6. Proposed Backend Sub-System

The backend sub-system typically consists of the following:

The Communication/transaction server that connects to the GPRS service provider's infrastructure for acquiring AFCS related transactions from the ETMs/ validators of all buses and sending it to the CSTC server. Sending the necessary new fare structures and parameters available on the CSTC server to the ETMs and Validators.

The components are as follows:

a) The Centralized Data Server, which holds the complete AFCS system's database.
b) The CCC workstations that are used to obtain information and generate reports rele vant for the CSTC from the AFCS server
c) The backend sub-system provides a wide variety of MIS reports.
d) The AFCS backend includes a software module, which interfaces with the backend s erver for mapping the initialized smart card data.

4.8. TRAFFIC MANAGEMENT MEASURES

4.8.1. Parking Management Measures

The CMP aims at promoting the use of public transport for sustainability. Providing more and more parking spaces does not solve the purpose of mobility, as the parking spaces get eventually exhausted with a high rate of vehicle growth. Instead, existing off-street parking spaces need to be used efficiently to promote only short-term parking. As a parking management strategy specifically for Core, long-term parking in Core is discouraged. On-street parking is proposed to be discouraged in general and it should be paid, if provided.

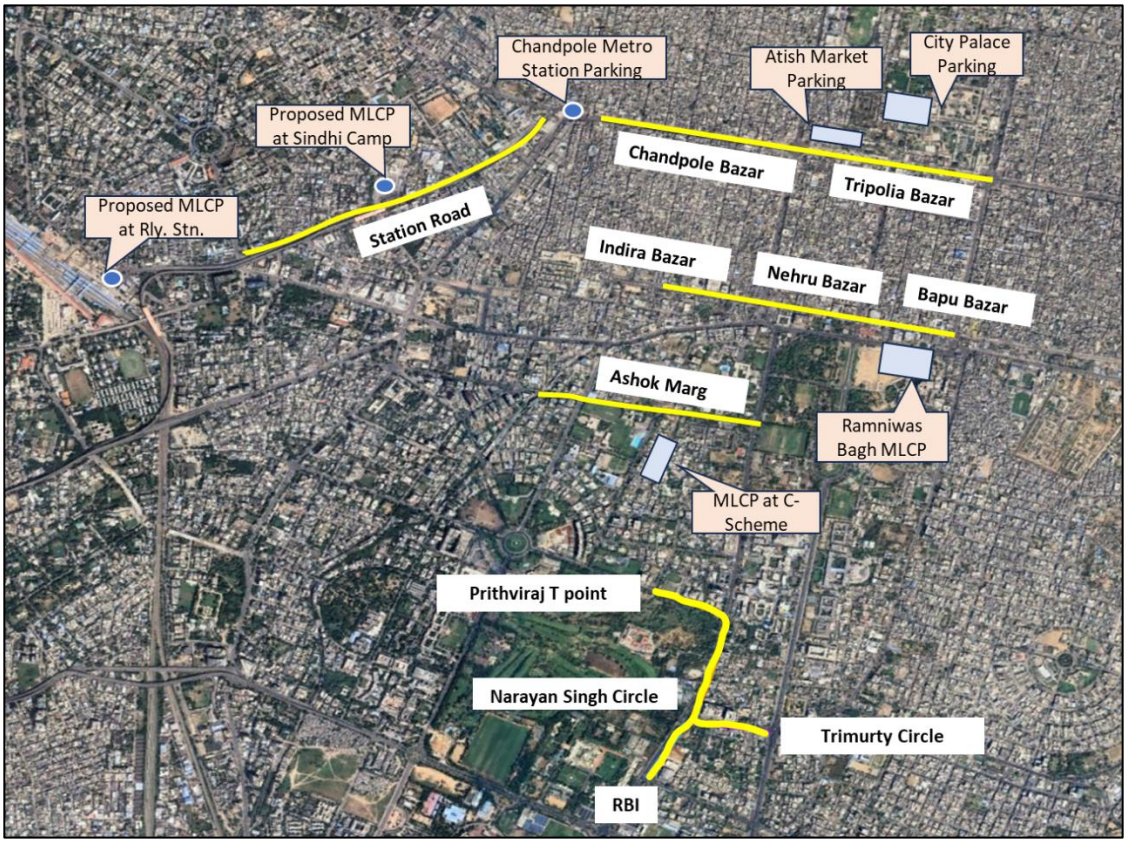
- **No Parking Zones**

Unauthorised parking areas have been identified on some important roads. These roads are narrow and lying in commercial areas and witness high degree of traffic congestion. To curb on-street parking, the following roads proposed as "No Parking zones" and imposed electronic ticketing/fining system for better enforcement and transparency if someone parks. The roads proposed for banning of on-street parking are given in **TABLE 4.22** and **FIGURE 4.31**.

TABLE 4.22 PROPOSED NO PARKING ZONES

S. NO.	NAME OF ROAD SECTION	LENGTH (KM)	Parking (ECS)
1	Bapu Bazar Road	0.4	80
2	Nehru Bazar Road	0.4	80
3	Indira Bazar Road	0.6	120
4	Chandpole Bazar Road	0.9	180
5	Tripolia Bazar Road	0.8	160
6	Station Road from Chandpole to Khasa Kothi	1.5	300
7	Ashok Marg	1.0	200
8	Narayan Singh Circle to Trimurty Circle	0.4	70
9	Prithvi Raj T Point to RBI	1.2	240
Total Length (Km)		**7.2**	**1430**

FIGURE 4.31: PROPOSED NO PARKING ZONES



There will be requirement for an additional parking facility in case of implementation of no parking zones. This additional parking facilities, as shown in **TABLE 4.23**, may be provided at the existing Multilevel parking at Ramniwas Bagh and C-scheme. Off-street parking at City Palace, Atish Market, Chandpole Metro Station Parking. There is a proposal of MLCP at Jaipur Junction Railway Station which may also be used for that purpose. In addition, Shuttle services may also be provided from parking facilities to market areas.

TABLE 4.23: AUTHORIZED PARKING SPACE NEAR NO PARKING ZONES

PARKING LOCATION	PARKING (ECS)
Existing Parking	
Ramniwas Bagh MLCP	2500
City Palace	1150
Atish Market	600
Chandpole	40
C-Scheme MLCP	400
Proposed Parking	
Railway Station MLCP (Proposed)	900
Sindhi Camp MLCP (Proposed)	1000
Total	**6590**

- **On-Street Parking**

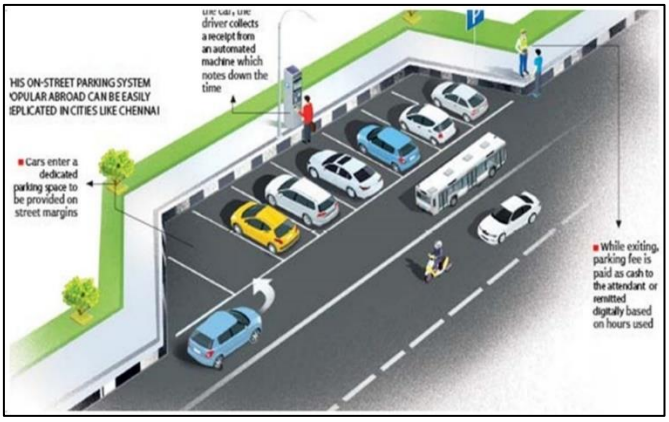
The Roads having the space between the carriageway and footpath has been used for bus bays and parking. Redesigning the roads to include these features, creating space for paid parking. If successful, this can be replicated on wide roads across the city.

In order to reduce the width of parking and leaving more space for carriageway, angular on-street parking can be proposed instead of perpendicular parking. The angular parking will also ease the drivers while parking. **(FIGURE 4.32, FIGURE 4.33)**

FIGURE 4.32: ON-STREET PARKING STRATEGY



FIGURE 4.33: ON-STREET ANGULAR PARKING

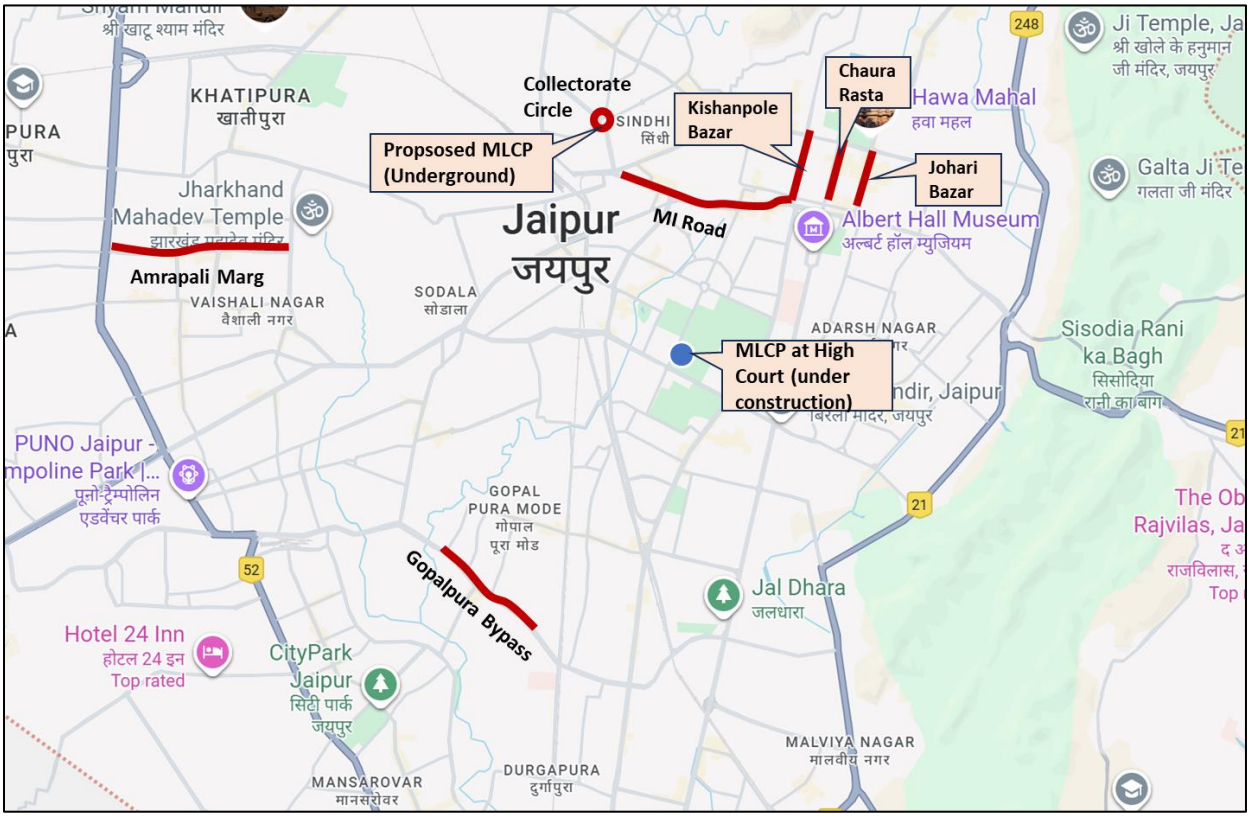


In Jaipur, on-street parking has been observed on various road sections in core areas including walled city. Considering the high parking demand along these road sections and no alternative available for off-street parking facilities, on-street paid parking has been proposed on the following road sections as presented in **TABLE 4.24**, **FIGURE 4.34**

TABLE 4.24 PROPOSED ON-STREET PAID PARKING ZONES

S. NO.	NAME OF ROAD	LENGTH (KM)	PARKING (ECS)
1	Johari Bazar Road	0.8	160
2	Chaura Rasta Road	0.8	160
3	Kishanpole Bazar Road	0.8	160
4	MI Road (Park Street to Ajmeri Gate)	2.2	440
5	Amrapali Marg	2.3	460
6	Collectorate Circle	0.5	100
7	Gopalpura Bypass (Triveni Chauraha to Mahesh Nagar)	1.5	300
Total Length (Km)		**8.9**	**1780**

FIGURE 4.34: PROPOSED ON-STREET PAID PARKING ZONES



- **Multilevel Parking**

Smart city applications are being implemented in many countries, as they improve the quality of life of their citizens and help reduce environmental pollution by optimizing time and fuel consumption. RFID Based multi-level parking is popular among smart cities, as it can be of use to transit hubs, commercial business hubs, to control access

and parking allocations. The system resolves and highlights the smart parking reduces congestion, increases revenue as applicable, has a pricing system that is adjusted based on the demand for availability on-peak hours and reinforces traffic laws by using the integrated ticket system (**FIGURE 4.35**).

FIGURE 4.35 RFID BASED AUTOMATIC MULTI-LEVEL PARKING SUGGESTION



Two locations have been identified for the development of multilevel parking in Jaipur. These locations will take care of both existing on-street parking and future demand of the core area. All multi-level or exclusive parking facilities for private vehicles shall also be provided and at least 10% of total space provision for IPT modes, NMT and feeder buses, as per local requirement along with all infrastructure facilities such as smooth vehicle circulation, signages, marking, CCTV cameras, safety, and security. However, more details shall be worked out during the DPR/ execution stage of the project. The proposed locations of multilevel parking are:

1. High Court (under construction by JDA)
2. Collectorate Circle (underground parking)

4.8.2. Traffic Circulation Plan

4.8.2.1. One Way Proposal from Khasa Kothi to Chandpole to Shaheed Smarak

Currently, at this road elevated Metro alignment goes underground before reaching Chandpole. Due to presence of Sindhi Camp bus terminal of around 31,150 sq. mt. which falls on station road, encroachment and unorganized parking create congestion. **(FIGURE 4.36)**

FIGURE 4.36: SINDHI CAMP BUS TERMINAL APPROACH



Three lane 9 m wide road is basically used for the entry/ exit of the Sindhi camp terminal, and rest of the available width is encroached by the private bus booking counters, shops, stalls, auto-rickshaws and people walking on the road **(**FIGURE 4.37**)**. A 1.5 m wide median on the road does not provide sufficient turning radius for the vehicles at the median cut due to which traffic chaos can be observed along the road.

FIGURE 4.37: CROSS SECTION OF ABUTTING ROAD



TRAFFIC ISSUES

- No designated and organized parking is available for IPTs and private vehicles outside the terminal which results in on-street parking of IPTs and private vehicles. The on-street parking reduces the effective carriageway capacity of the road as shown in **FIGURE 4.38.**

FIGURE 4.38: UNORGANIZED IPT AND CAR PARKING



- Vehicles have to turn from the median gap to enter the terminal which creates a conflict point with the existing road traffic and during peak time, they completely stall the traffic as shown in **FIGURE 4.39.**

FIGURE 4.39: SERIES OF BUSES ENTERING TO SINDHI CAMP



- Footpaths are not available for the pedestrian movement alongside the road. Jay walking is observed due to absence of pedestrian crossing facilities **(FIGURE 4.40).**

- One entry/ exit gate of the Metro is opening inside Sindhi camp terminal and other one is on the other side of the abutting road which results in heavy pedestrian crossing movement and pedestrian – vehicle conflicts**.**

FIGURE 4.40: PEDESTRIAN – VEHICULAR CONFLICTS ALONG STATION ROAD



SITE CIRCULATION PLAN

To address chronic congestion, mixed traffic conflicts, and limited right-of-way conditions in the Khasa Kothi–Sindhi Camp – Chandpole – Shaheed Smarak corridor, a loop-based one-way traffic circulation system is proposed. As per the plan, vehicular movement from Khasa Kothi Circle towards Chandpole is proposed as one-way, covering the high-intensity commercial and transit-oriented stretch around Sindhi Camp and Station Road. This arrangement is intended to streamline traffic flow, reduce opposing vehicle conflicts, improve bus operations and pedestrian safety near Sindhi Camp Metro Station and bus terminals, and enhance effective carriageway capacity through better lane discipline.

As shown in **FIGURE 4.41**, the return movement is proposed via Chandpole to Shaheed Smarak and onward to Khasa Kothi Circle, forming a continuous one-way loop supported by select two-way links for local access and emergency movements. The proposed circulation is expected to reduce intersection delays, improve junction performance at Chandpole and Shaheed Smarak, and facilitate smoother public transport operations.

- **Reversing the entry and exit gates at Sindhi Camp Bus Terminal**

  The circulation within Sindhi Camp Bus terminal is proposed to be made clockwise for a better circulation with the abutting road which will overcome the conflicts. By shifting the entry and exit points, circulation will be improved.

FIGURE 4.41: ONE WAY PROPOSAL FROM KHASA KOTHI – CHANDPOLE – SHAHEED SMARAK



4.8.2.2.One Way Proposal at Gandhinagar Railway Station

Gandhinagar Jaipur Railway Station faces significant access and circulation issues due to unorganised traffic movement and competing land-use activities in the station forecourt. Mixed traffic comprising private vehicles, autos, e-rickshaws, buses, and pedestrians operates without clear segregation, leading to frequent congestion and safety conflicts. Informal parking, encroachments, and roadside vending reduce the effective carriageway width and obstruct passenger movement, especially during peak train arrival and departure hours. The absence of a well-defined pick-up/drop-off arrangement and holding areas for intermediate public transport results in random halting of vehicles close to station entry points. Pedestrian infrastructure is inadequate, with discontinuous footpaths and unsafe crossing conditions across busy approach roads.

To improve access, reduce congestion, and enhance passenger safety on the PF–01 side of Gandhinagar Jaipur Railway Station, a one-way traffic circulation system is proposed as indicated in the **FIGURE 4.42**. The north–south corridor along the station frontage is proposed to operate as a one-way movement, facilitating smooth and conflict-free vehicular flow for passenger pick-up and drop-off activities. Key connecting roads linking Tonk Phatak, Gopalpura Bypass Road, and the internal sector roads are proposed to function as two-way corridors, ensuring area-wide connectivity and minimizing diversion

distances. This arrangement segregates through-traffic from station-oriented traffic, reduces vehicular conflicts at the station forecourt, and allows better management of autos, e-rickshaws, and private vehicles.

FIGURE 4.42: ONE WAY PROPOSAL NEAR GANDHINAGAR JAIPUR STATION



4.8.2.3. One Way Proposal within Walled City

The Walled City of Jaipur faces acute mobility challenges due to its narrow historic street network, very high pedestrian and commercial activity, and intense mixed traffic comprising private vehicles, IPT modes, goods vehicles, and non-motorised users. Unregulated on-street parking, encroachments, and street vending significantly reduce effective carriageway width, leading to frequent bottlenecks and delays. Pedestrian movement is largely unmanaged, with limited footpaths and unsafe crossings at key junctions, resulting in high vehicle–pedestrian conflicts.

To streamline traffic movement, reduce congestion, and improve safety within the Walled City area, a structured one-way circulation system is proposed as illustrated in the **FIGURE 4.43**. The proposal organizes traffic movement along a rectangular loop formed by the primary peripheral corridors and key north–south spines. The east–west movement is proposed as two-way along the outer corridors connecting Ajmeri Gate–Ghat Darwaza on the southern side and Choti Chaupar–Badi Chaupar–Ramganj Chaupar on the northern side, thereby maintaining continuity for cross-city movement and public transport operations.

Within this loop, the major north–south streets—namely Kishanpole Bazaar Road, Chandpole Bazaar Road, Johari Bazaar Road, and Ghat Darwaza Bazaar Road—are proposed to operate as one-way corridors, facilitating smoother directional flow through narrow market streets and reducing conflicts at intersections. This segregation of movement is expected to improve vehicular throughout, enhance pedestrian safety in high-footfall bazaar areas, and allow better allocation of road space for walking, vending management, and emergency access.

FIGURE 4.43: ONE WAY PROPOSAL IN WALLED CITY OF JAIPUR



4.8.3. Street Design Components

The street design components and pallets are suggested based on the available right of way (ROW) for pedestrian-friendly environment and smooth circulation. The street design components and palettes are presented in **FIGURE 4.44** and **FIGURE 4.45**.

FIGURE 4.44: STREET DESIGN COMPONENTS

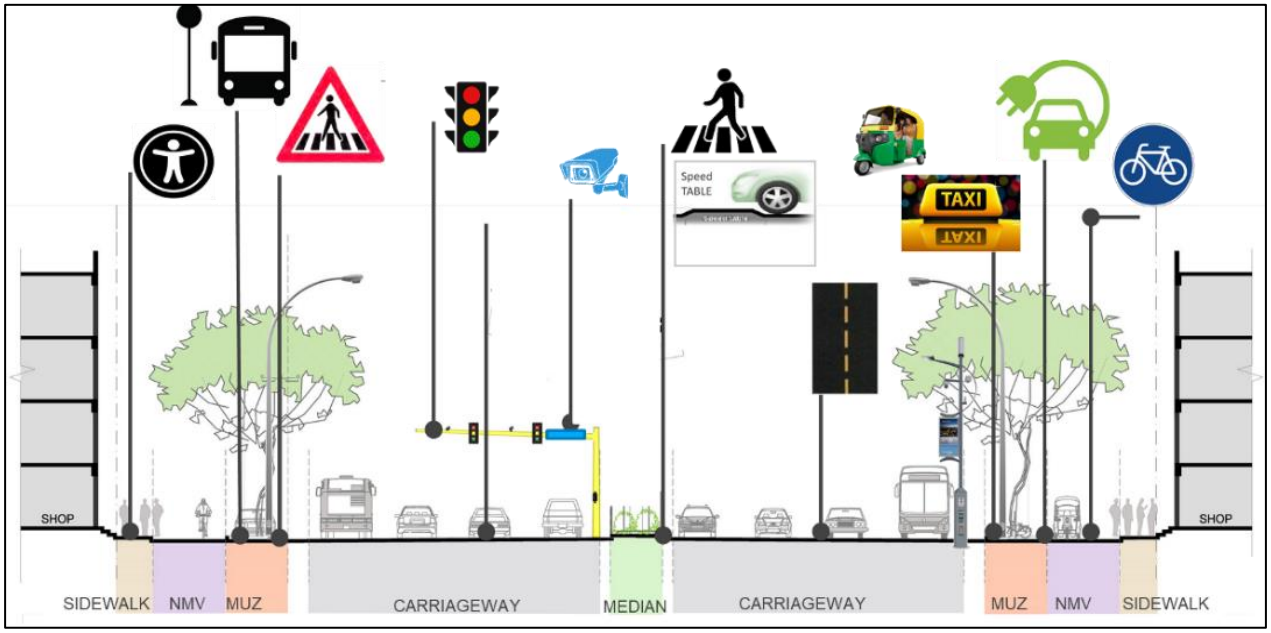


FIGURE 4.45: STREET DESIGN PALETTES



- Signages with English and Local Languages for easy understanding of the same to local people
- Stone Carved for Major Street names

	• Bollards • To prevent traffic from entering into specified area • Granite stone and steel bollard • Wrought iron with lighting in built
	• Footpath material • Locally sourced material • Flagstone (flat stones) • Grass pavers to soften texture • Patterns relevant to local culture
	• Streetlight • Traditional lamp posts • Morden streetlights as sculptural elements • Solar panel integrated in the canopy design





- Street furniture
- Use of urban street furniture
- Fixed Benches with Different Design/Forms



4.8.4. Junction Improvement Measures

Traffic congestion is a growing challenge in Jaipur and needs to be addressed through a range of traffic management interventions. At present, traffic control measures are minimal, with most of the signalized junctions being non-functional. A large number of junctions remain uncontrolled, which is a major cause of congestion, particularly in the city's core area. Several key junctions that cater to heavy traffic volumes suffer from faulty geometry and lack of proper traffic control mechanisms. These junctions have been identified for improvement through geometric redesign and introduction of appropriate traffic management measures.

To enhance efficiency and safety, the following measures are suggested:

- **Traffic Signal Upgradation:**
  - Reactivate and modernize traffic signals with adaptive/area traffic control systems.
  - Introduce pedestrian phases in the signal cycle.
  - Integrate signals with Intelligent Transport Systems (ITS) for coordinated corridor management.

- **Rotary Geometry Improvements:**
  - Reduce excessive rotary diameters (where feasible) to improve deflection and reduce high-speed weaving.
  - Modify entry and exit radii to conform to IRC standards, ensuring smoother merging and diverging movements.
  - Introduce channelizing islands to separate turning movements and guide vehicles.

- **Median Realignment:**
  - Remove or realign protruding medians that obstruct entry/exit movements.
  - Provide uniform median noses with proper end treatment for safety.

- Ensure median openings are rationalized and restricted to planned movements only.

- **Pedestrian Safety Measures:**
  - Provide zebra crossings at entry and exit arms with refuge islands.
  - Grade-separated crossings (FOBs/subways) may be considered at high pedestrian volume rotaries.
  - Introduce tactile paving, ramps, and adequate lighting for universal accessibility.

- **Traffic Calming & Safety Enhancements:**
  - Use speed calming measures at rotary approaches (rumble strips, markings).
  - Improve visibility with advance warning signage, retro-reflective markings, and street lighting.
  - Provide guard rails/barriers at pedestrian crossing points to channel safe movement.

- **Public Transport Integration:**
  - Relocate bus stops and IPT stands away from rotary mouths to avoid congestion.
  - Design designated lay-bys for public transport near, but not obstructing, rotary circulation.

- **Enforcement & Management:**
  - Deploy traffic wardens at peak hours until signalization is fully operational.
  - Introduce CCTV monitoring linked to the Integrated Command & Control Centre (ICCC).
  - Ensure regular maintenance of signals, signage, and markings.

- **Split Cycle Offset Optimization Technique (SCOOT)**

  SCOOT is a tool for managing and controlling traffic signals in urban areas. It is an adaptive system that responds automatically to fluctuations in traffic flow through the use of on-street detectors embedded in the road. This system typically reduces traffic delay by an average of 20% in urban areas. Apart from this, SCOOT also contains other traffic management facilities such as:
  - Bus priority
  - Traffic gating
  - Incident detection
  - On-line saturation occupancy measurement
  - Vehicle emissions estimates

  SCOOT based traffic management is recommended for all mobility corridors in the city.

  The locations of identified junctions proposed for junction improvement measures are presented below in **TABLE 4.25** and **FIGURE 4.46.** The following measures may be suggested at the identified junctions.

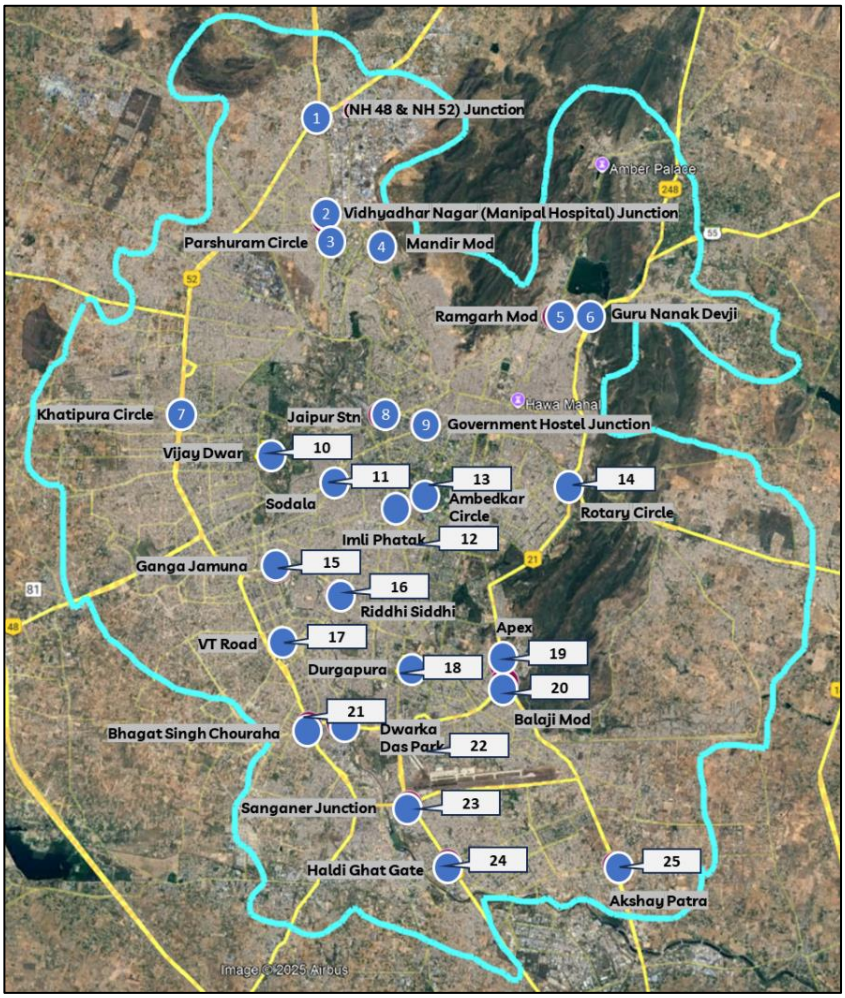
- Rotary Optimization: Reduction of rotary diameter to release an additional lane (3.5 m) for smoother circulation.
- Introduction of Pelican Signal phase in traffic signals to ensure safe pedestrian movement.
- Proposal of divided carriageway along all the arms of the junctions
- Dedicated Movement Lanes: Provision of U-turn lanes and channelized left turns through traffic islands or bollards, supported by free-left movement where feasible.
- Pedestrian Safety Measures: Raised tabletop pedestrian crossings at junction entries/exits, complemented by refuge islands and adequate markings.
- Removal of roadside encroachments near junctions to maximize effective carriageway width and improve visibility.
- Signage & Wayfinding: Installation of advance directional signage boards and road markings for better driver guidance.
- Geometric Improvements: Extension of medians, realignment of turning radii, and provision of proper entry/exit geometry as per design standards.
- Traffic Calming & Safety: Deployment of speed tracking devices with video cameras near black spots to monitor and enforce safe speeds.
- Public Transport Integration: Relocation of auto-rickshaw and bus stops away from junction influence areas to reduce bottlenecks and improve safety
- Restriping of lanes and stop lines to improve traffic discipline and visibility.

TABLE 4.25: PROPOSED LOCATIONS FOR JUNCTION IMPROVEMENT

S. NO.	PROPOSED LOCATIONS FOR JUNCTION IMPROVEMENT
1	Adarsh (NH 48 & NH 52) Junction
2	Vidhyadhar Nagar (Manipal Hospital) Junction
3	Parshuram Circle
4	Mandir Mod
5	Ramgarh Mod Junction
6	Guru Nanak Devji Circle
7	Khatipura Circle
8	Jaipur Station
9	Government Hostel Junction
10	Vijay Dwar Junction
11	Sodala Junction
12	Imli Phatak Junction
13	Ambedkar Circle

S. NO.	PROPOSED LOCATIONS FOR JUNCTION IMPROVEMENT
14	Rotary (Transport Nagar) Circle
15	Ganga Jamuna Cirlce
16	Riddhi Siddhi Circle
17	VT Road Junction
18	Durgapura Circle
19	Apex Circle
20	Balaji Mod Junction
21	Bhagat Singh Chouraha (New Sanganer)
22	Dwarka Das Park Junction
23	Sanganer Junction
24	Haldi Ghat Gate
25	Akshay Patra Circle

FIGURE 4.46: LOCATION OF JUNCTIONS PROPOSED FOR IMPROVEMENT IN JAIPUR



The junction improvement measures suggested for some of the major critical junctions have been presented as follows:

1. **Ambedkar Circle:** The proposed measures at the junction to improve traffic conditions are as follows:

   - Reduction of the rotary diameter to create an additional lane (3.5 m) around the rotary for improved circulation.
   - Activation of the junction traffic signal system and removal of temporary barricades currently used for U-turns.
   - Implementation of a dedicated pedestrian signal system to ensure safe pedestrian movement.
   - Provision of a divider for lane bifurcation in place of bollards at the Jan Path arm of the junction.
   - Realignment of the median on Bhawani Singh Road by shifting it back up to the pedestrian crossing, thereby increasing the effective carriageway width at the rotary.

   FIGURE 4.47 provides a schematic illustration of the proposed junction improvement measures at Ambedkar Circle.

2. **Apex Circle:** The proposed measures at the junction to improve traffic conditions are:

   - Removal of the existing rotary and installation of a modern traffic signal system for effective control of vehicular and pedestrian movement.
   - Shifting back of medians along Calgiri Marg and Bikaner–Agra Road by 3–3.5 m to provide additional carriageway width at the junction.
   - Provision of traffic islands/bollards to enable channelized traffic movement, including free left-turn facilities.
   - Construction of raised tabletop pedestrian crossings across all arms of the junction to ensure pedestrian safety and universal accessibility.

   FIGURE 4.48 provides a schematic illustration of the proposed junction improvement measures at Apex Circle.

3. **Mandir Mod Circle:** The proposed measures at the junction to improve traffic conditions are as follows:

   - Shifting back of the median on RPA Road and towards the bus bay by 3–3.5 m to increase the carriageway width, thereby accommodating at least one additional lane at the rotary.
   - Provision of raised tabletop pedestrian crossings across all arms of the junction to ensure safe pedestrian movement.

- Installation of a divider in front of the bus bay to segregate mainline traffic from bus traffic and reduce conflicts.

FIGURE 4.49 provides a schematic illustration of the proposed junction improvement measures at Mandir Mod Circle.

4. **Dhobi Ghat Circle:** The proposed measures at junction to improve traffic conditions are:

- Conversion of the existing elliptical rotary into a circular rotary with an 8 m diameter to streamline circulation and reduce conflict points.
- Provision of traffic islands/dividers to facilitate channelized movement and enable free left turns.
- Increasing the effective width between the rotary and adjoining medians to enhance capacity and reduce bottlenecks.
- Ensuring signal-free straight traffic flow from Delhi side towards Transport Nagar to minimize delays and improve corridor efficiency.

FIGURE 4.50 provides a schematic illustration of the proposed junction improvement measures at Dhobi Ghat Circle.

5. **Parshuram Circle:** The proposed measures at the junction to improve traffic conditions are as follows:

- Shifting of the median to increase the available width between the rotary and the median, thereby improving vehicular circulation capacity.
- Retention of the existing rotary size, as reduction in diameter is not required at this location.

FIGURE 4.51 provides a schematic illustration of the proposed junction improvement measures at Parshuram Circle.

6. **Rotary Circle:** The proposed measures at the junction to improve traffic conditions are:

- Size of rotary to be retained
- Reduction in the size of traffic islands to optimize available carriageway space.
- Provision of a dedicated bus lane along the approach arm adjacent to the bus stand.
- Closure of the direct entry/exit of roadways buses to the bus stand from the junction to minimize conflicts.
- Introduction of separate entry and exit points for buses to streamline movement.
- Prohibition of bus stoppage/halting at the junction, with designated bus bays provided at suitable locations away from the intersection.

FIGURE 4.52 provides a schematic illustration of the proposed junction improvement measures at Rotary Circle.

FIGURE 4.47: PROPOSED IMPROVEMENT MEASURES AT AMBEDKAR CIRCLE

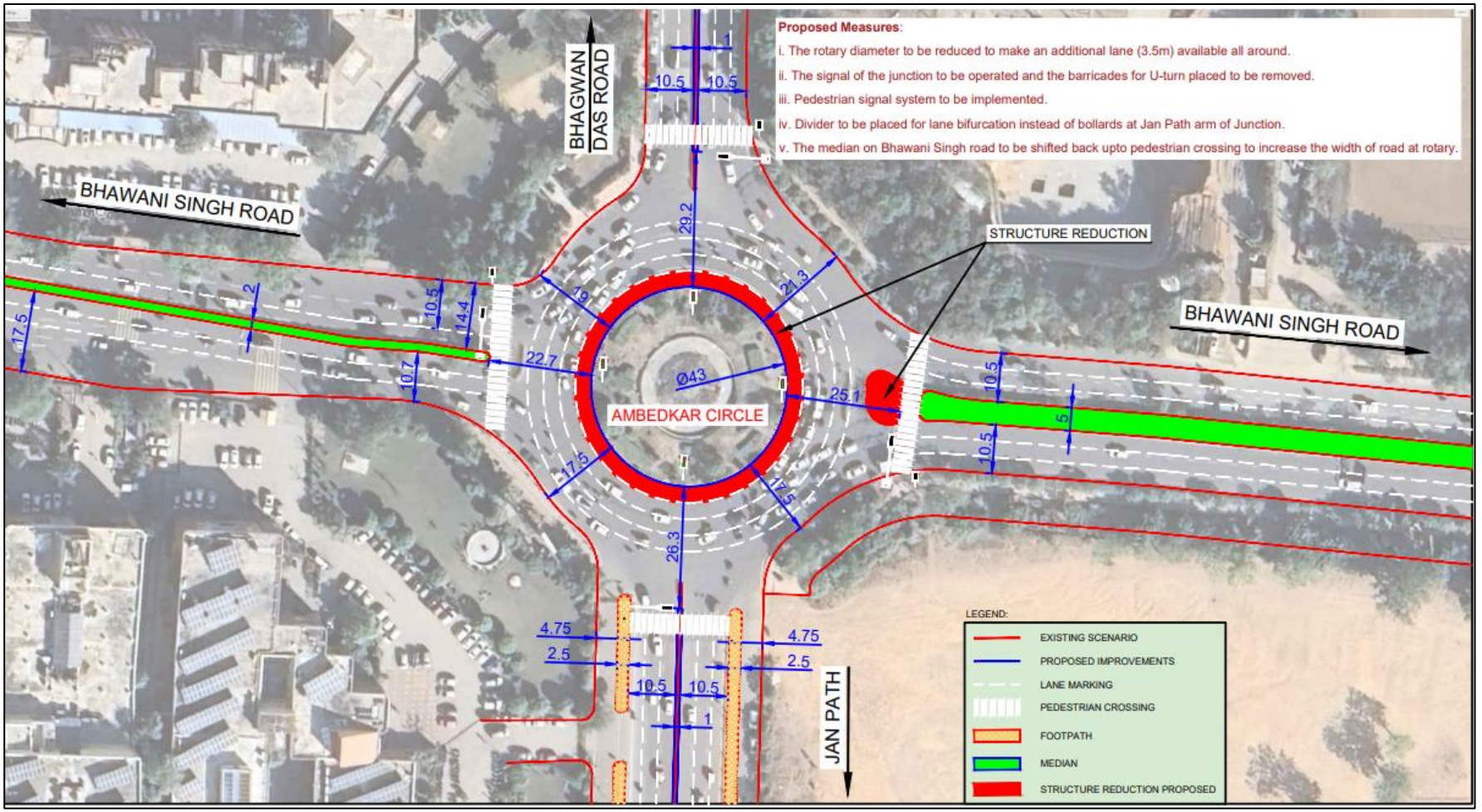


FIGURE 4.48: PROPOSED IMPROVEMENT MEASURES AT APEX CIRCLE

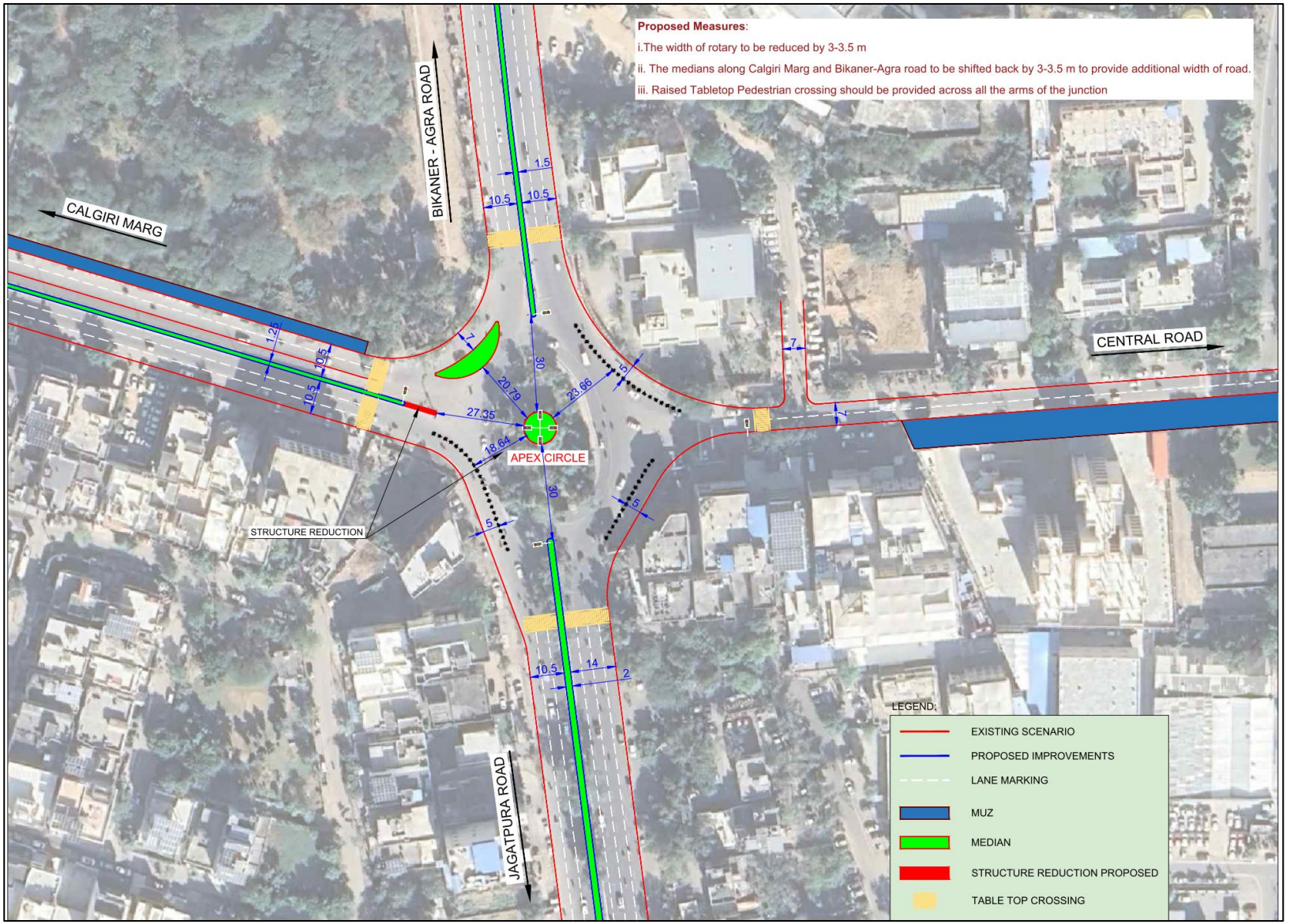


FIGURE 4.49: PROPOSED IMPROVEMENT MEASURES AT MANDIR MOD CIRCLE

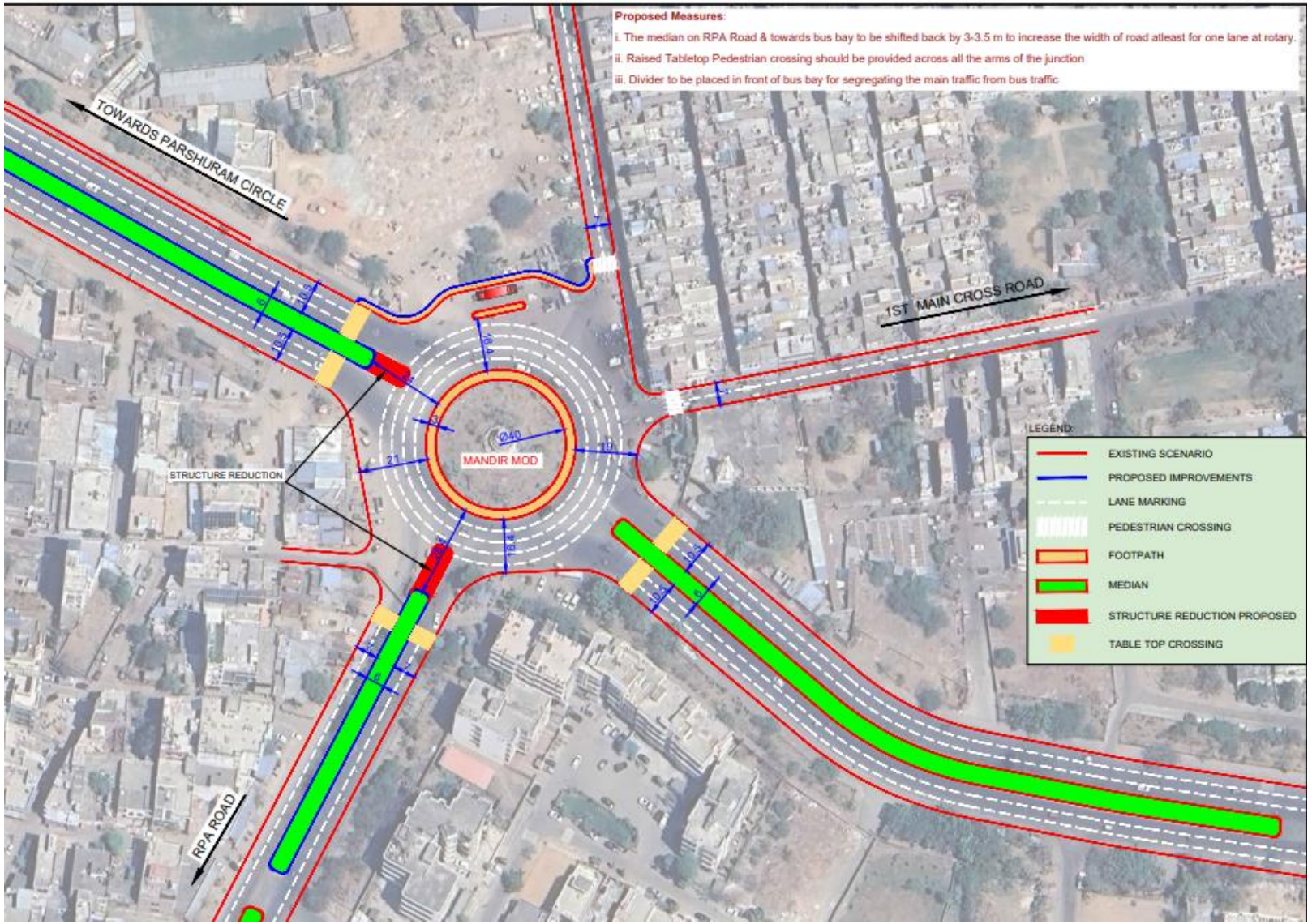


FIGURE 4.50: PROPOSED IMPROVEMENT MEASURES AT DHOBI GHAT CIRCLE

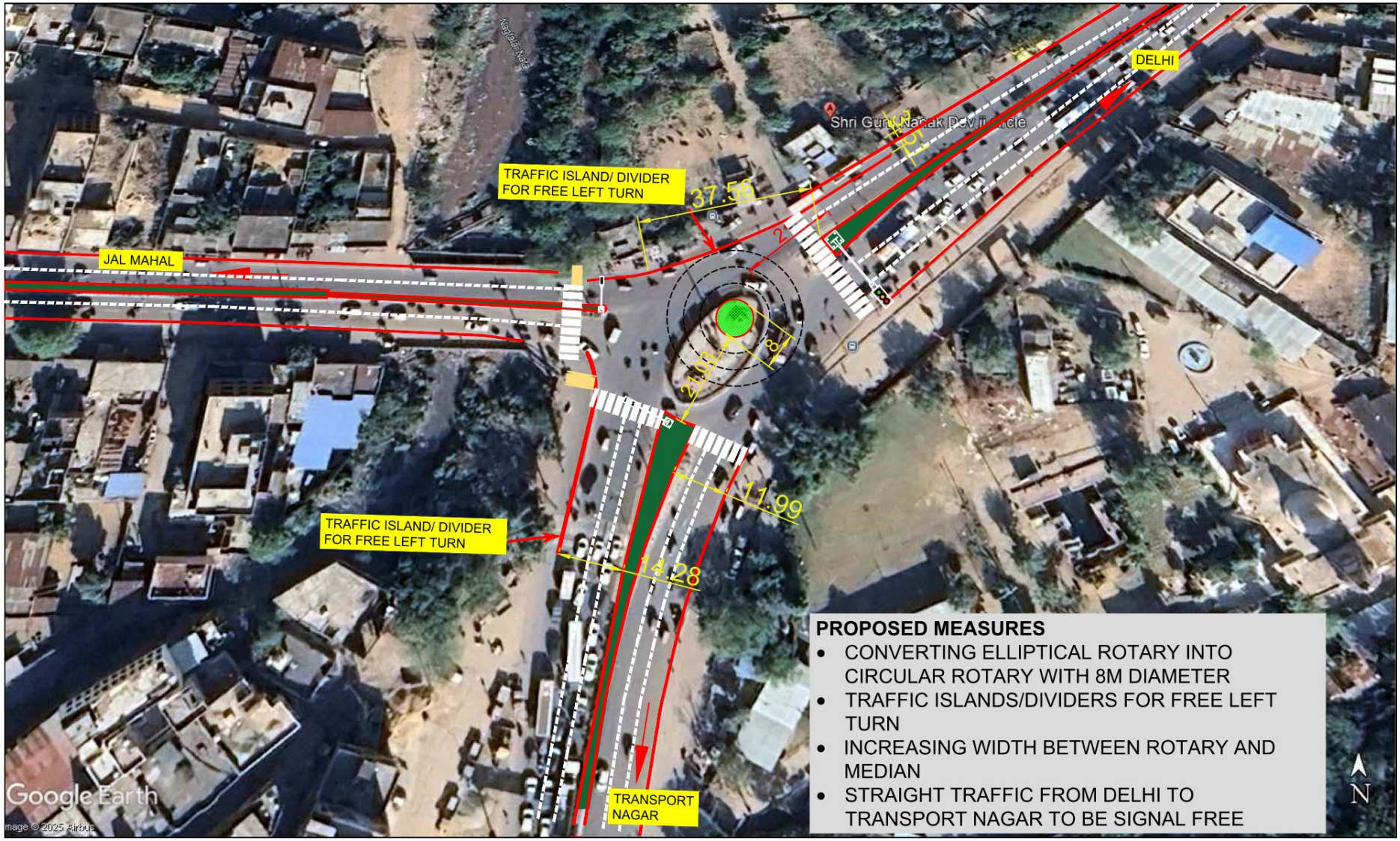
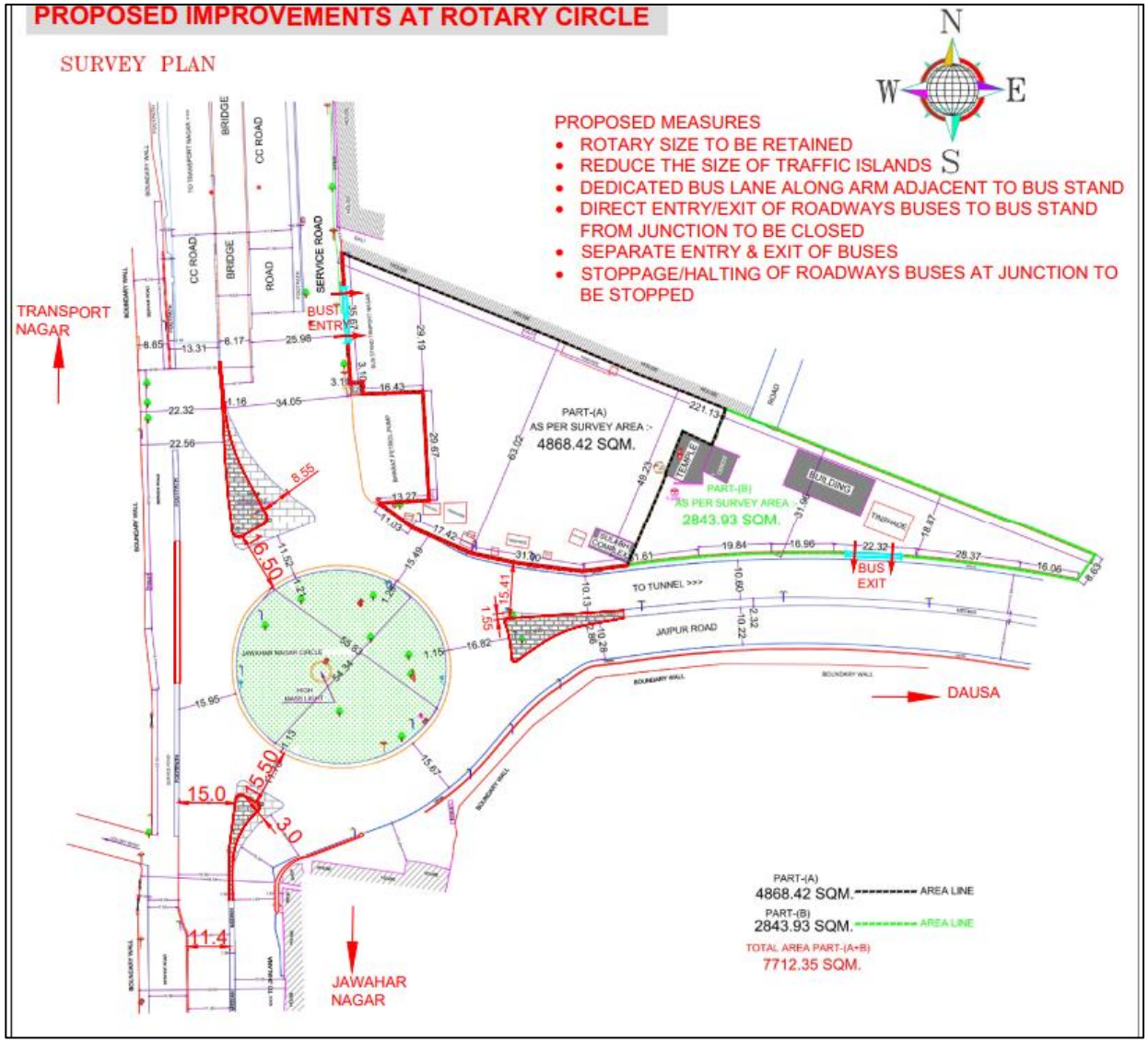


FIGURE 4.51: PROPOSED IMPROVEMENT MEASURES AT PARSHURAM CIRCLE



FIGURE 4.52: PROPOSED IMPROVEMENT MEASURES AT ROTARY CIRCLE



4.8.5. Traffic Safety Plan

With the increase in number of vehicles on roads, city is also experiencing increase in number of accidents. The rate of fatality is very high when compared to total accidents indicating almost every second accident involving fatality. Though high road accidents may be resultant of poor road geometrics and dilapidating infrastructure, a high share of road fatality indicates need of public awareness and strict enforcement of traffic rules. Serious efforts need to be made in road design and infrastructure along with traffic management and law enforcement to improve the situation.

To control the accident and fatality rates in the city, black spots or accident-prone areas need to be addressed on urgent basis. Following measures have been recommended to handle the accident-prone areas

- Installation of speed tracking devices with video cameras near black spots.
- Setting up of stationary/mobile police posts near black spots.
- Installation of traffic lights at accident prone intersections.
- Centralized emergency setup to omit delay in case of an emergency.
- Redesign of intersections to remove engineering flaws

Apart from proposals for black spots, following measures are recommended to improve safety and proposed to be implemented on priority:

- Helmets to be made compulsory for both rider and pillion
- Front row seat belts to be made compulsory.
- Cancellation of driving license at third incidence of fine.
- Active surveillance by police mobile vans/bikes.
- Strict enforcement of Pollution control measures.
- Installation of pollution control kiosks at all fuel stations.

a. Public Awareness Programs

Public Awareness Program (PAP) is an integral component of the strategy for Traffic Safety. Traffic safety should be inculcated at an early stage. To achieve this, widespread Public Awareness Programs should be carried out in educational institutes. These programs may be conducted by NGOs in close coordination of Traffic Police. PAP put into operation effectively will go long way in enabling the implementation of above proposed safety measures.

4.9. INFORM AND ENGAGE STAKEHOLDERS INCLUDING CITIZENS

The proposed measures given in previous sections have been derived with extensive Stakeholder consultations held during the course of the Study. The stakeholder consultations were carried out through one-to-one meetings held with various

stakeholders at different stages of the study. The stakeholders who gave their inputs time to time in firming up the mobility improvement measures proposed in CMP include:

- Rajasthan State Industrial Development and Investment Corporation
- Rajasthan Housing Board
- Jaipur City Transport Services Limited
- Jaipur Nagar Nigam
- Jaipur Smart City
- Traffic Police
- Rajasthan Urban Infrastructure Development Project
- Jaipur Metro Rail Corporation
- Airport Authority of India
- North Western Railway Jaipur
- National Highways Authority of India
- Rajasthan State Road Transport Corporation
- Regional Transport Office
- Transport and commercial associations of city

4.10. REGULATORY AND INSTITUTIONAL MEASURES

4.10.1. Regulatory Measures

Limited road capacity, increasing vehicle ownership and limited penetration of public transport are the main reasons for the present chaotic traffic scenario in the city. The following regulatory measures are required to bring in improvements in the present scenario.

a. Transport Demand Management

Transportation Demand Management or TDM refers to various strategies that change travel behavior (how, when and where people travel) in order to increase transport system efficiency and achieve specific objectives such as reduced traffic congestion, increased safety, improved mobility for non-drivers, energy conservation and pollution emission reductions**. TABLE 4.26** gives the TDM Measures used worldwide to manage the transport demand in the cities.

TABLE 4.26: TRANSPORT DEMAND MANAGEMENT MEASURES

TYPE OF MEASURES	MEASURES
ECONOMIC	• Road user charging
	• Parking charges
	• Public transport subsidization
	• Fuel Tax
	• Restraint on Vehicle Ownership
LAND USE	• Car-free developments and location of new developments
	• Park and Ride Facilities
	• Public transport promotion
	• Intensive development along major PT routes
INFORMATION FOR TRAVELERS	• Travel Information before a trip is undertaken
	• Car Sharing
ADMINISTRATIVE MEASURES	• Parking Controls
	• Pedestrianised Zones
	• Alternative working patterns (Flexi time etc.)
	• Different weekly offs days for various market areas

i. Park and Ride and PT Promotion

Park & Ride facilities and promotion of public transport are the key components of the strategy adopted to meet the demand in horizon years. Public transport promotion needs to be carried out through policy interventions as well as awareness programs. The mass transport system plan detailed in previous sections will promote public transport and would help to increase its targeted modal share.

ii. Preferential HOV Parking and Carpool Promotion and Coordination

Preferential HOV parking and carpool promotion and coordination provide opportunities for socializing and reduce commute times through the usage of dedicated carpool lanes. The designation of premium parking spaces for High Occupancy Vehicles (HOV) modes is an inexpensive way to encourage employees to carpool or vanpool. It is intended to make HOV spaces highly valued among employees over single occupant vehicle spaces. The priority spaces are located close to the building entrances to reduce the walk time for carpool and vanpool users. Reduced walk times yield a relative reduction of travel times for HOV users. In addition to demonstrating employer support for HOV commuting, preferential HOV parking may also reduce the demand for employee parking spaces. Parking permit fees may also be waived or reduced for HOVs as an added incentive.

Carpool promotion and coordination is successful when implemented by employers because they can efficiently market the programs at the workplace and provide matching functions based on employer records. As employees commute from areas

further away from employment centers to buy affordable housing, vanpools become increasingly attractive as a means to reduce single-occupant trips.

iii. Alternative Measures

Alternative work-hour programs offered by individual employers such as the compressed work week, flexi time, and telecommuting are TDM strategies that directly reduce the number of trips taken by employees to travel to work.

A compressed work week allows employees to work longer days in exchange for an additional day off that would normally be worked. For example, employees may work eight nine-hour days and one eight-hour day, in a 10-day (2-week) pay period, totaling 80 hours and permitting one day off each two weeks. In other cases, employees may work four ten-hour days each week, with one day off each week. This program not only reduces the amount of peak hour commute trips, but also is often attractive to employees, increasing morale and job satisfaction.

Other strategies such as “flexi time” or staggered work hours can be used to reduce peak hour trips and spread trips throughout non-peak times by allowing employees to begin and end work at a time that is different from the typical 9 A.M. to 6 P.M. work schedule. Flexi work time can be particularly attractive to employees with commutes that are congested during peak times, but do not result in the elimination of daily trips in the manner achieved by the compressed work week strategy.

All over the world, cities have adopted TDM measures to control congestion and promote public transport. The lessons learnt from the experience suggest that TDM should be sold as a part of an overall transport strategy. The public has to see the big picture. TDM is only one part of a package of measures, which included others like building roads, sophisticated traffic management, priority for bus movements, and new rail system. All the parts of the package need to be done in parallel to get the desired result.

b. Transit Oriented Development (TOD) Policy – Rajasthan (2025)

The Government of Rajasthan has notified the Transit Oriented Development (TOD) Policy, 2025 to promote compact, mixed-use, and transit-supportive urban development along major public transport corridors. The policy seeks to integrate land-use and transport planning to increase public transport ridership, reduce reliance on private vehicles, optimise infrastructure investments, and enable sustainable and efficient urban growth.

Under the policy, TOD influence zones are delineated within walkable catchments of mass transit facilities such as metro stations, railway stations and other high-capacity public transport systems. These zones are envisaged as high-density, pedestrian-

oriented areas supporting a balanced mix of residential, commercial, institutional, and recreational uses, thereby enabling shorter trip lengths and enhanced access to daily activities through public transport.

A key aspect of the policy is the provision of development incentives, including enhanced FAR/FSI and flexible land-use provisions, subject to compliance with prescribed urban design, access, and infrastructure norms. The policy encourages reduced parking standards within TOD zones to discourage private vehicle use and promote modal shift towards public transport, walking, and cycling. Strong emphasis is placed on Non-Motorised Transport (NMT) infrastructure, including wide and continuous footpaths, universal accessibility, active street frontage, and safe last-mile connectivity to transit stations.

The TOD Policy mandates integration with statutory planning instruments such as Master Plans, Development Plans, and Comprehensive Mobility Plans (CMPs), ensuring that transit investments are supported by appropriate land-use planning. Development authorities are required to identify TOD nodes, prepare area-specific TOD plans, and enable coordinated implementation through close collaboration among urban local bodies, transport agencies, and infrastructure providers. Institutionally, the policy encourages the creation of dedicated TOD cells or nodal agencies to facilitate approvals, inter-departmental coordination, and monitoring of TOD initiatives. Implementation is largely market-driven, allowing voluntary participation by landowners and developers while adhering to prescribed planning and design standards.

The policy provides a clear implementation framework through TOD Schemes, classified as Category-1 (up to 1 ha) and Category-2 (1 ha and above) based on scheme area. Category-1 schemes must be entirely located within the Intense Development Area (IDA) of a TOD node, where mixed use is permitted but not mandatory. Category-2 schemes may partially or fully fall within the IDA; however, mixed use is mandatory across the entire scheme, with at least 25% of the area within the IDA and full inclusion within the TOD Planning Area. All TOD schemes are required to have access from an existing road with a minimum Right of Way (ROW) of 18 m, and provisions are made for plot amalgamation and reconstitution to facilitate integrated and comprehensive development.

The policy prescribes mixed-use distribution and development intensity through defined Built-up Area Ratio (BAR) norms based on existing land use and scheme category. A balanced mix of residential, commercial, and public/semi-public uses is ensured, while retaining minimum proportions of the original land use. The required mix may be achieved either horizontally across plots or vertically within buildings, subject to compatibility and safety considerations. BAR for a TOD scheme is calculated as the aggregate of BAR entitlements of all constituent plots. For both Category-1 and Category-2 schemes, the base BAR is as per prevailing Building Bye-laws, with an enhanced TOD BAR of up to 3.0, subject to a minimum ROW of 12 m. Building height is

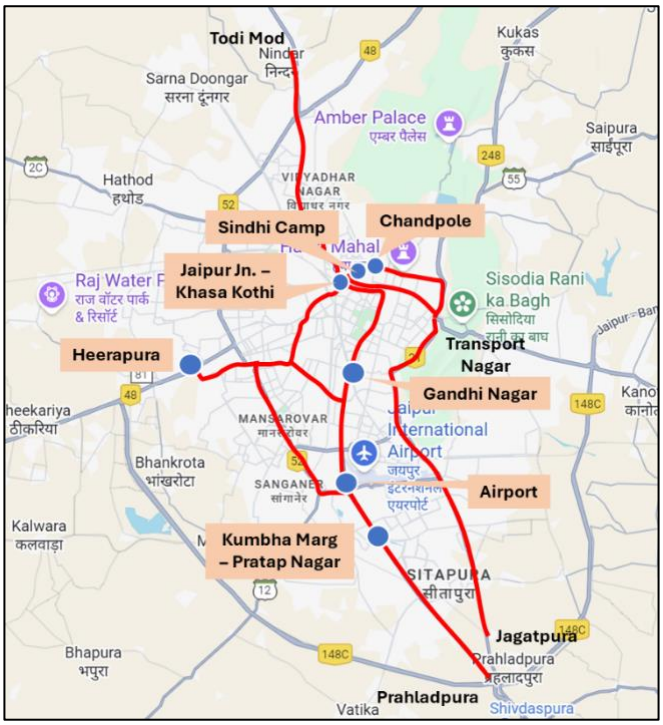
regulated in relation to ROW and front setback, capped at 1.75 times the ROW plus front setback, while maximum ground coverage is limited to 50% for schemes up to 1 ha and 45% for schemes above 1 ha. Additional purchasable BAR beyond 3.0 is permitted on payment of a betterment levy, varying by land use and BAR slab, enabling value capture from intensified development.

In line with the policy provisions, proposed TOD zones and nodes have been identified for the city and integrated into the planning framework as shown in **TABLE 4.27, FIGURE 4.53**. High densification along TOD zones has been explicitly considered under the Sustainable Urban Transport Scenarios, reinforcing the role of transit-oriented development in improving public transport viability, managing travel demand, and achieving long-term sustainable mobility outcomes.

TABLE 4.27: PROPOSED TOD ZONES AND NODES IN JAIPUR

TOD ZONES (CORRIDORS)	TOD NODES
Heerapura – Mansarovar – Badi Chaupar – Transport Nagar (Metro Ph 1)	Jaipur Junction – Khasa Kothi
Tonk Road (Prahladpura –Todi Morh) – Metro Phase 2	Sindhi Camp Bus Terminal
Transport Nagar – Balaji Morh – Jagatpura (Mahal Rd)	Chandpole
MI Road	Heerapura Bus Terminal
Mansarovar – Sanganer	Gandhi Nagar Rly. Station
Gopalpura Bypass	Airport
	Kumbha Marg – Pratap Nagar

FIGURE 4.53: PROPOSED TOD ZONES AND NODES IN JAIPUR



4.10.2. Institutional Measures

Urban transport is made up of multiple components managed by many agencies with overlapping responsibilities. There is no integrated planning or coordination between various agencies or even integration of services. Transport professionals are seldom employed. Each agency seeks its own budget and spends as per its own priorities. Urban transport thus becomes the secondary responsibility of several agencies in the city and at State and Central Government level.

a. Existing Institutional Arrangements

Jaipur Development Authority (JDA) and Jaipur Municipal Corporation (JMC) share the primary responsibility for urban transport planning, design and management with the role and responsibility demarcated for each of the organizations.

JDA's primary function is to prepare macro level development plans and strategies for 20-30 years perspective. JMC holds the responsibility of providing basic services and infrastructure and preparing the Transport Planning schemes.

Following is the list of primary institutions concerned with different facets of transport and other infrastructure in Jaipur:

- Jaipur Development Authority
- Nagar Nigam Jaipur
- Jaipur Metro Rail Corporation Limited
- Jaipur City Transport Services Limited
- Rajasthan State Road Transport Services
- Rajasthan State Bus Terminal Development Authority
- National Highways Authority of India
- Rajasthan PWD
- RTO Jaipur
- Traffic Police Jaipur
- Rajasthan Tourism Department

b. Organization of PT & IPT Operation

Public transport system in Jaipur is unorganized. Being individually dominated unorganized operation; the role played by PT modes goes unrecognized and is resulting in underutilization of resources. The government buses are being operated by Jaipur City Transport Services Limited (JCTSL) on contractual basis with RSRTC and private operators whereas minibuses are being operated by only private agencies. The existing city public transport comprises of both JCTSL buses (procured under JnNURM) and unorganized private minibuses operated by various private operators.

It is proposed to form an organized agency in charge of providing transport services in Jaipur city. For that purpose, a Special Purpose Vehicle (SPV) may be set up as a public-private partnership by way of granting route permits to private bus operators to run their buses in the city. JCTSL may also be used to function as a SPV for that purpose.

SPV may be formed with the following objectives:

- To create specialized and effective agency to monitor the intra-city public transport system.
- To establish and maintain modern high capacity means of public transport.
- To develop support system for improving transport infrastructure.

SPV will concentrate mainly on planning, implementing, setting service quality standards and monitoring performance and outsources operations, revenue collection, and so on to private companies in a transparent manner.

c. Enforcement Measures by Traffic Police

The traffic regulatory measures are looked after by the Superintendent of Police supported by the Additional Superintendent of Police and Deputy Superintendent of Police and assisted by the Circle Inspector, Sub-Inspectors and assistant Sub-Inspector.

Strict enforcement by Police is required to ensure the smooth flow of traffic and implementation of the proposals. Following measures are proposed for the same:

- Traffic education and public awareness programs on regular basis to educate the public on traffic rules and their benefits.
- It is proposed that scheme of Traffic police on motorbikes to impose on the spot fines on traffic offenders may be started to ensure traffic discipline in the city.
- Heavy fines for habitual offenders
- Scheme of mobile courts to check on encroachments on traffic infrastructure and to punish the habitual traffic offenders may also be introduced.
- To play the envisaged role in enforcement, the strengthening of Traffic Police is recommended.

d. Need for Unified Metropolitan Transport Authority (UMTA)

The above discussion suggests that there are many agencies involved in urban transport in Jaipur. As such there is nothing wrong with the multiplicity of authorities. However, currently there is no mechanism to ensure coordination among various institutions which is one of the key roadblocks affecting formulation and implementation of major schemes and initiatives to improve the traffic situation and mobility in the city.

The National Urban Transport Policy 2014 has recommended setting up of Unified Metropolitan Transport Authorities (UMTA's) in million plus cities. The policy document stipulates following on UMTA

"The current structure of governance for the transport sector is not equipped to deal with the problems of urban transport. These structures were put in place well before the problems of urban transport began to surface in India and hence do not provide for the right coordination mechanisms to deal with urban transport. The central government will, therefore, recommend the setting up of Unified Metropolitan Transport Authorities (UMTA's) in all million cities to facilitate more coordinated planning and implementation of urban transport programs & projects and integrated management of urban transport systems. Such Metropolitan Transport Authorities would need statutory backing in order to be meaningful."

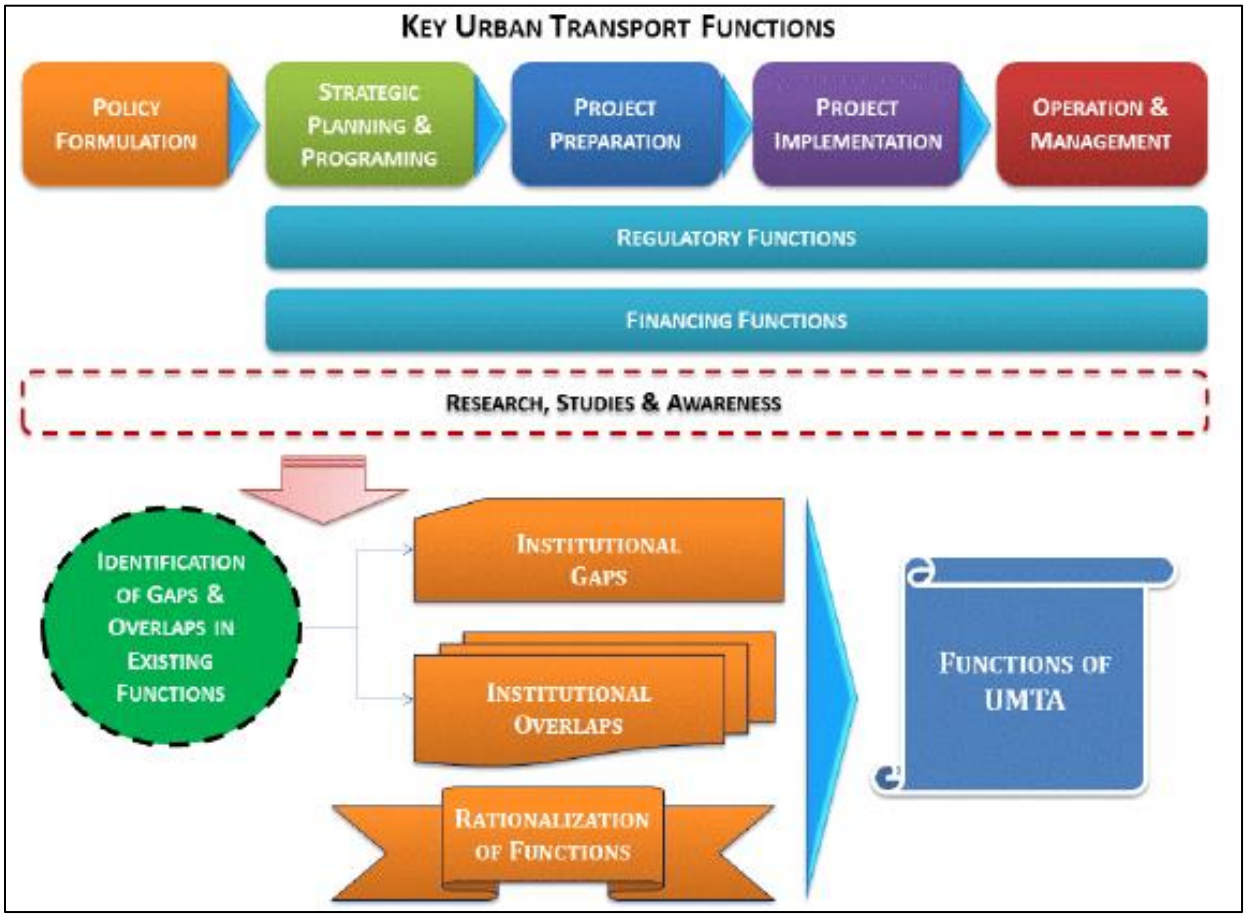
The metro rail policy - 2017 makes it mandatory for the cities which are planning to have MRTS to address their mass transport requirements to have city level UMTA. Deloitte Touche Tohmatsu India Pvt. Ltd. on behalf of MoHUA carried out a detailed study on UMTA. Major functions of UMTA as envisaged in the study are presented in the **FIGURE 4.54.**

The study proposes that UMTA could be given a larger set of functions through legislation, but be assigned these functions in stages, as the organization evolves and builds capacity, and as higher level of acceptance is achieved about UMTA's role amongst key stakeholders. UMTA could thus first take up the range of functions that today are the key gaps or overlaps and gradually it can look towards rationalizing functions of existing agencies and taking over an appropriate group of functions. In this light, UMTA may be assigned functions which lie between the aforesaid two extremes arrangements, and less complex and feasible in operationalization. The extent of functions involved under this arrangement are given below:

- Assist and advise government on urban transport matters
- Prepare, adapt and administer urban transport policies, strategies, standards and guidelines for the urban area under its jurisdiction.
- Prepare a multi-modal transport master plan integrated with land use
- Updation of Comprehensive Mobility Plan (CMP)
- Prepare a detailed multi-year program for urban transport
- Monitor and audit compliance with CMP and the Multi-year Programme
- Approve urban transport projects and activities
- Promote the development of integrated facilities and systems for urban transport
- Oversee operation of integrated facilities and systems for public transport

- Contract public transport services so as to provide mobility and integrated public transport
- License (issue permits for) public transport services
- Monitor and advise on fees and charges for roads, public transport, parking, and other public transport facilities and services and regulate fares for urban bus services
- Enforce regulations for which UMTA is responsible
- Fund, or arrange/recommend/approve funding for, urban transport infrastructure in whole or in part
- Monitor and audit the use of UMTA funding
- Maintain records relating to urban transport, including details of projects, services, funding, and public transport safety
- Develop and manage local performance indicators for urban transport
- Monitor and advise on public transport safety
- Conduct research, studies, education and awareness about good practices in urban transport

FIGURE 4.54: UMTA'S FUNCTIONS



Source: Study by Deloitte Touche Tohmatsu India Pvt. Ltd. on behalf of MoUD 2014

The proposed compositions of the governing board for UMTA in respect of Jaipur city is presented below **TABLE 4.28.**

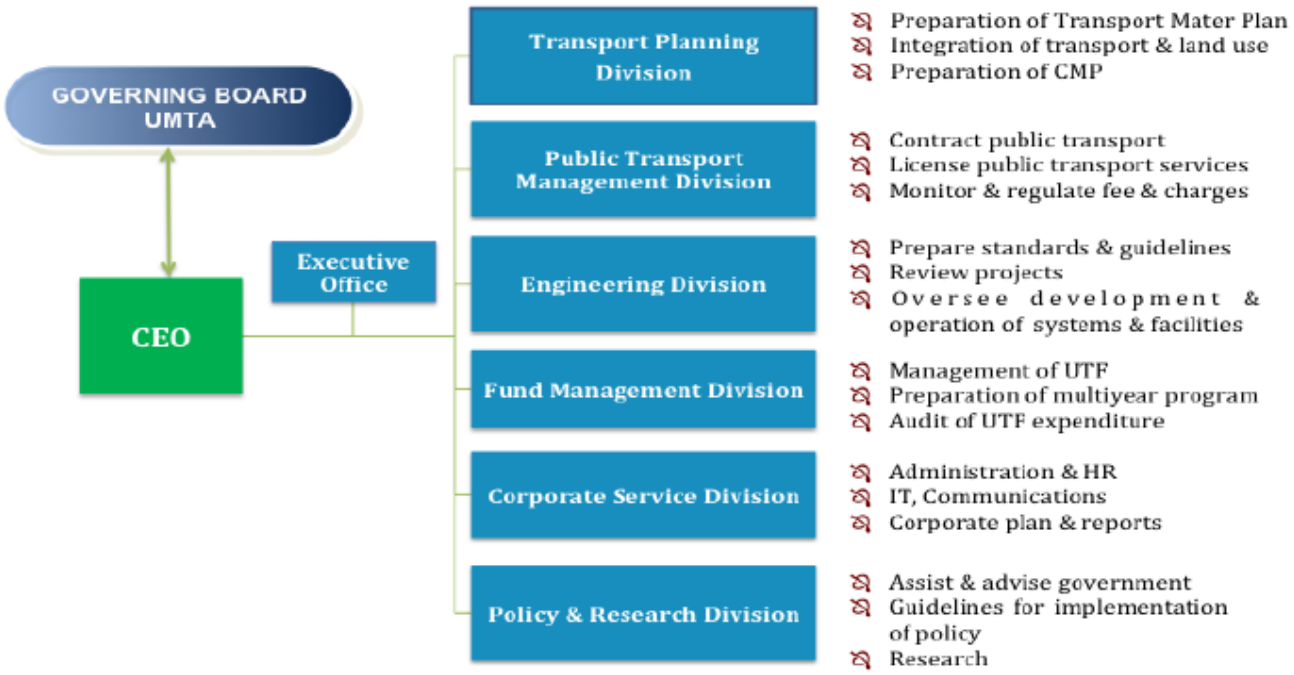
TABLE 4.28: PROPOSED COMPOSITIONS OF THE GOVERNING BOARD FOR UMTA

REPRESENTATIVES	ROLE
Representatives from Central Government	
National Highways Authority of India	Member
Indian Railways	Member
Airport Authority of India	Member
Representatives from State Government	
Transport Department (RSRTC/RSBTDA)	Member
Jaipur Metro Rail Corporation	Member
Public Works Department	Member
RIICO	Member
RUIDP	Member
Police Department	Member
Representatives from Local Government	
Jaipur Nagar Nigam	Member
Jaipur Development Commissioner	Member
RTO	Member
JCTSL	Member
Members from Private Sector	
Corporate Governance Expert	Member
Finance Expert	Member
Law Expert	Member
Urban Transport Institutions' Representative	Member
Public Transport Beneficiaries' Representative	Member
Representative of Cyclists and Pedestrians	Member
Transport Association's Representative	Member
Employers' Representative	Member

There is an urgent need to create this authority for smooth handling of the issues related to traffic and transport in the city.

The governing board of a UMTA for a particular metropolitan or urban area will be assisted by a fully-fledged organization headed by a full-time Chief Executive. The CEO will be responsible for all day-to-day activities of UMTA in accordance with the policies approved by the board and the delegations given by the board. A schematic organization structure for a UMTA with the preferred range of functions is illustrated in **FIGURE 4.55.**

FIGURE 4.55: ORGANISATION STRUCTURE FOR UMTA



Some aspects of UMTA activities, such as UTF management, accounting, IT, and communications, can be outsourced to service providers. Activities such as issuing licenses could be delegated and contracted to agents. Consultants could be employed for distinct activities such as preparation of the Transport Master Plan and the Comprehensive Mobility Plan, development of standards and guidelines, review of proposals and audit of implementation, preparation of contracts, preparation and delivery of awareness campaigns, and research. These considerations will determine the actual shape of the organization below the divisional level shown.

e. Traffic Engineering Cells (TEC)

A large number of agencies deal with roads such as JMC, JDA, Traffic Police, PWD, NHAI, etc. There are numerous issues of proper road geometrics, traffic circulation, junction design, traffic signals, road signs/markings, street furniture etc. which are properly attended to by these agencies due to lack of traffic engineering expertise. Traffic planning is a continuous affair. It is therefore important that Traffic Engineering Cells are established within JMC, JDA & Traffic Police with qualified and adequate staff such as traffic engineers. This will ensure that the traffic schemes are properly implemented with better results and fine-tuned later, if necessary. This will go a long way to improve traffic flow in Jaipur.

4.11. DEVELOPMENT OF FISCAL MEASURES

4.11.1. Fare Policy for Public Transport

a. Principles for Rational Public Transport Tariff Design

Public transport tariff design is the key for creating an enabling environment for dynamic and sustainable growth of public transport sector. The fundamental principle of tariff determination is to ensure that prices lead to an optimum level of investment, operation, and demand in the sector.

Generally, there is a conflict between the different objectives of fare. For example, to increase the share of public transport and addressing issues of social sustainability require that the fares be kept sufficiently low, while efficiency improvement and viability issues require periodic fare increases with the increase in cost of input of the service. The agencies in this sector need to balance these objectives to achieve a sustainable outcome. Similarly, to ensure environmental and social sustainability, it may be necessary to subsidize public transport operations.

b. Effect on Demand of Bus Services

An increase in public transport fares could lead to modal shift to private modes. Thus, public transport fares would have to be benchmarked on the cost of alternative modes of transport to ensure that a modal shift is checked. For addressing issues of social sustainability, it is imperative that the fares be kept sufficiently low. However, tariffs should provide incentives for efficiency improvements so as to reduce the cost of operation.

c. Subsidy Administration

Whenever the government desires that a particular class of consumers be provided public transport services at subsidized fares, it is recommended that the government to that effect make the allocation explicitly.

d. Fare Revisions

Fare Revision mechanism should be reasonable, transparent, and accepted to both, the passenger and the operator. Generally, the fare revision process is not transparent or scientific. Today the fare revisions are usually a compromise between competing pressures from operators for an enhancement in the fares and pressures from commuters for not affecting any increase. Invariably, there is a time lag between such an increase in the input costs and the increase in fares leading to delays in fleet augmentation and replacement and thus poor quality of service. However, for

improvements in the service quality fare revisions should be rationalized and made systematic

e. Integrated Ticketing and Fare Management Systems

To enable seamless, integrated, and user-friendly urban mobility in Jaipur, it is proposed the implementation of a Unified Mobility Card (UMC) across the city's public transport and allied mobility services. The UMC shall serve as a single, interoperable, and cashless payment instrument for passengers, reducing dependency on multiple tickets and payment systems.

The proposed UMC shall be aligned with the National Common Mobility Card (NCMC – One Nation, One Card) framework and shall be implemented through coordinated efforts of Jaipur Metro Rail Corporation (JMRC) and Jaipur City Transport Services Limited (JCTSL). The card shall enable seamless travel across Jaipur Metro services operated by JMRC and city bus services operated by JCTSL, with future integration of suburban rail services, parking facilities, and other mobility-related services.

Implementation of the UMC is expected to significantly reduce transaction time at ticketing counters, minimize queuing during peak hours, and improve passenger convenience and accessibility. The system will support online recharge facilities, mobile-based integration, and multiple fare products, including passes and time-based tickets, thereby improving operational efficiency and ridership experience.

The UMC will also facilitate data-driven transport planning and operations, providing valuable insights into passenger travel patterns, peak demand periods, and modal interchange behavior. Such data shall support service optimization, rush management strategies, fare integration and revisions, and capacity planning for public transport.

Phased implementation approach is recommended, with initial deployment across Jaipur Metro and city bus services, followed by expansion to parking management, park-and-ride facilities, and other urban transport services

4.11.2. Parking Pricing Strategy

The land in urban areas is limited and there is a limit to the parking space that can be created in the city. The parking demand is growing with growth of vehicles in Jaipur. The institutional, public semipublic and busy/commercial areas are major attractors to the long-term parking. This results in the vehicle parking spilling to streets (main roads or side streets). One of the important tools to control parking is Parking Pricing. This may include following measures:

- Levy incremental parking fee on on-street parking
- Off street parking charges to be less than the on-street parking charges

- Differential parking fee in the core areas and outside the core area
- Phasing out of on-street parking from major roads and development of off-street parking
- Stringent enforcement measures by way of fine and other penal actions need to be provided for violation of parking rules

a. Parking Pricing for Core Area

It is proposed to levy incremental parking charges upon on-street parking in the areas inside the core and walled city area which includes the areas of Johari Bazar, Kishanpole Bazar, Chaura Rasta, Ramganj Bazar, MI Road etc. Along with this, off street parking complexes need to be developed to accommodate private vehicles as well as to provide defined space for goods IPT vehicles facilitating goods transaction without hurdling the traffic. It is proposed that about 20% ECS shall be left reserved for goods IPT vehicles in each off-street parking complex. For an efficient utilization of available space, long-term parking shall be discouraged by levying incremental fares.

b. Parking Pricing for Area beyond Core Area

Parking pricing for areas beyond core area is proposed to be lower than that of areas inside the core area. Higher parking charges for internal areas will reduce parking demand in these congested areas. Similar to parking pricing strategy for internal areas, short-term parking is promoted for areas beyond core area as compared to long-term parking by incremental pricing for high rate of parking turnovers.

c. Other measures:

As parking is unsatiated demand, it is proposed that regulatory tools need to be adopted to cater parking demand generated by a building inside its own premises. This will cater to the parking demand, likely to be generated by upcoming developments in the city. Broad measures to ensure availability of parking inside a building premises include:

- Traffic Impact Assessment (TIA) of new developments
- Provision of ground level and basement parking for estimated parking demand in TIA
- Incremental fee at surface / lower ground level to ensure short term parking

4.12. MOBILITY IMPROVEMENT MEASURES PROPOSED IN CMP AND NUTP OBJECTIVES

The objective of National Urban Transport Policy (NUTP) of GoI is to plan for the people rather than vehicles by providing sustainable mobility and accessibility to all citizens to jobs, education, social services and recreation at affordable cost and within reasonable time. This will involve:

- Incorporating urban transportation as an important parameter at the urban planning stage rather than being a consequential requirement.
- Bringing about a more equitable allocation of road space with people, rather than vehicles, as its main focus
- PT should be citywide, safe, seamless, user friendly, reliable and should provide good ambience with well-behaved drivers and conductors.
- Walk and cycle should become safe modes of Urban Transport.
- Introducing Intelligent Transport Systems for traffic management
- Addressing concerns of road safety and trauma response
- Raising finances, through innovative mechanisms
- Establishing institutional mechanisms for enhanced coordination in the planning and management of transport systems.
- Building capacity (institutional and manpower) to plan for sustainable urban transport and establishing knowledge management system that would service the needs of all urban transport professionals, such as planners, researchers, teachers, students, etc.

The land use and transport measures proposed in the CMP will improve mobility in Jaipur and cover the critical issues addressed in the NUTP. **TABLE 4.29** summarizes the relationship between the NUTP objectives and the measures proposed in the CMP.

TABLE 4.29: SUMMARY OF MOBILITY IMPROVEMENT MEASURES PROPOSED IN CMP IN RELATION TO NUTP

S. NO.	NUTP OBJECTIVES	PROPOSED MOBILITY IMPROVEMENT MEASURES
1	Priority for Pedestrians	Footpath proposed along all major corridors Recommended cross-section includes footpaths Pedestrian signal phase at critical junctions FOBs/Subways at locations with high pedestrian footfall
2	Priority for Non-Motorized	Dedicated NMV lanes proposed along roads in industrial clusters Recommended cross sections include NMV lanes Proposal for Public E-Bike sharing scheme
3	Priority for Public Transport	• Proposed MRTS Corridors (Phase 2, 3 & 4) • Proposed City Bus Routes and Midi Bus Routes • Recommended Network for bus operation and IPT operation • Requirement of bus fleet and bus infrastructure is provided including terminals and depots
4	Parking	• Identification of corridors for on-street paid parking and no parking zones • Proposal of multilevel parking at 2 locations

S. NO.	NUTP OBJECTIVES	PROPOSED MOBILITY IMPROVEMENT MEASURES
5	Integration of Land Use and Transport Planning	• Intensive land use along major mobility corridors • High capacity public transport along major mobility corridors
6	Equitable Allocation of Road space	• Public transport system is proposed • Pedestrian and NMV lanes are recommended
7	Integrated Public Transport Systems	• Proposed feeder routes and IPT routes integrated with Metro and City Bus system • Proposed direction-oriented bus terminals integrated with various modes
8	Introduction of Para-transit Services	• Proposed Intermediate Public Transport (Shared Auto/E-Rickshaw) Routes • Recommended organization of Para-transit operation as a feeder mode to Metro and Bus corridors
9	Freight Traffic Improvement	• 4 freight terminals (direction oriented) have been proposed • Management measures such as entry and time restrictions for heavy vehicles recommended • Loading unloading by IPT during daytime in off street parking locations

4.13. IMPACT OF THE PROPOSED MEASURES ON SERVICE LEVEL BENCHMARK

Performance levels of Jaipur City were monitored against service level benchmarks (SLBs) in Chapter 2 wherein four LOS viz. 1, 2, 3, and 4 were specified, with 1 being highest LOS and 4 being lowest. Though the goal was to attain LOS 1, Jaipur fared poorly for most of the SLBs. SLBs identified for monitoring performance were:

- Public transport facilities
- Pedestrian infrastructure facilities
- Non-Motorized Transport (NMT)facilities
- Level of usage of Intelligent Transport System (ITS) facilities
- Travel speed (Motorized and Mass Transit) along major corridors
- Availability of parking spaces
- Road safety
- Pollution levels
- Integrated land use transport system
- Financial sustainability of public transport

Now, with proposals drafted for preferred sustainable transport scenario, the benchmarking against all the SLBs is again taken up to assess the benefits to be accrued in future by adopting the proposals in this report.

4.13.1. LOS of Public Transport Facilities

The city-wide LOS is being calculated for public transport systems during peak hours including organized bus-based systems. The criteria listed under SLBs are as follows:

- Presence of Organized Public Transport System in Urban Area (%)
- Extent of Supply Availability of Public Transport
- Service Coverage of Public Transport in the city
- Average waiting time for Public
- Transport users (mins)
- Level of Comfort in Public Transport
- % of Fleet as per Urban Bus Specification

With proposed MRTS network of about 138 Km, 9 city bus routes of total 254 km length, 15 Midi bus routes of 193 Km and 29 IPT routes, it is expected that Jaipur will have a widespread, accessible, comfortable and good transport system, placing it in the highest bracket of LOS 1.

4.13.2. LOS of Pedestrian Infrastructure Facilities

The SLB parameters for pedestrian infrastructure facilities include the following:

- Signalized intersection delay (%)
- Street Lighting (Lux)
- % of City Covered

These parameters cover the percentage of road length along the arterial and major road network or Public Transport corridors and at intersection that has adequate barrier free pedestrian facilities. With 16 km of road network identified for provision of NMV lanes and 25 Km of proposed footpath, proposal of at grade and grade separated pedestrian crossing facilities, and provision of on-street/Multilevel parking locations to remove encroachments from footpath, Jaipur is expected to achieve LOS 1.

4.13.3. LOS of Non-Motorized Transport Facilities

The SLB parameters for NMT facilities include:

- % of network covered
- Encroachment on NMT roads by Vehicle Parking (%)
- NMT Parking facilities at Interchanges (%)

These parameters indicate the percentage of dedicated cycle track / lane along the arterial & sub arterial road network or public transport corridors with a minimum of 2.5 m width. The service level is characterized by continuous length of NMT lanes, encroachment on NMT lanes, and parking facilities. With 16 km of road network

identified for provision of NMV lanes and 25 Km of proposed footpath, Jaipur is expected to achieve LOS 1.

4.13.4. LOS of Level of Usage of Intelligent Transport System (ITS)

ITS refers to efforts to add information and communications technology to transport infrastructure and vehicles to manage factors that typically are at odds with each other, such as vehicles, loads, and routes to improve safety and reduce vehicle wear, transportation times and fuel consumption. GPS/GPRS systems are required so as to cover all the public transport and intermediate public transport vehicles on the "National public transport helpline" besides the use for operational efficiencies. The parameters identified to assess the level of service for level of usage of ITS are:

- Availability of Traffic Surveillance (%)
- Passenger Information System (PIS) (in %)
- Global Positioning System (GPS)/ General Packet Radio Service (GPRS) (%)
- Signal Synchronization (%)
- Integrated Ticketing System (%)

Public transport services have been recommended for installation of GPS, security cameras and panic buttons along with linking with traffic control center for incident detection and response. ITMIS project has been proposed for smart mobility of buses. Also, all major junctions in the city are recommended to be installed with security cameras. Fare integration has also been recommended between different modes.

With the above interventions, Jaipur will be placed in the LOS 1 for ITS.

4.13.5. LOS for Travel Speeds along Major corridors

This level of service provides an indication of effective travel time or speed of Public / private vehicles by taking into account indications of congestion or traffic density. This level of service is along corridors, and not indicative of overall level of service from origin to destination. The parameters identified to assess the level of service include:

- Average Travel speed of Personal vehicles (KMPH)
- Average Travel speed of Public Transport (KMPH)

With an extensive network of MRTS corridors, Outer Ring Road and Arterials identified for the city, along with footpath and NMV network to avoid vehicular – pedestrian conflict, it is expected that Jaipur will be placed in the LOS 1 for Travel Speeds.

4.13.6. LOS of Availability of Parking Spaces

All parking locations (on and off street) have been proposed to be available on chargeable basis. 2 multi-level parking locations have been proposed. The corridors

have been identified for on-street paid parking. Also, parking pricing strategy has been recommended for the city with varying parking charges. This will place Jaipur in the LOS of 1.

4.13.7. LOS of Road Safety

Recommendations for road design (cross sections) to avoid conflict between different modes, strict enforcement to avoid traffic rules violations and extensive incident monitoring and response system are expected to reduce the fatalities to minimum. However, as responsibility for road safety also rests in the hands of users, conduct of public awareness campaigns have also been recommended in the CMP. It is expected that Jaipur will achieve zero tolerance against road fatalities.

4.13.8. LOS of Pollution Levels

This indicates the Level of air Pollutants in the city i.e. average level of pollution in urban areas. The indicator to calculate the pollution levels is Annual Mean Concentration Range (µg/m3). Parameters to assess the LOS for this SLB are:

- Level of SO2
- Level of Oxides of Nitrogen
- Level of RSPM (Size less than 10 microns)

CMP recommends the Technology Scenario for Jaipur. The CO_2 emissions are expected to decrease to 10,764 Tonnes per day under this scenario, bringing the city in the LOS 1 category.

4.13.9. LOS of Integrated Land Use Transport System

It Indicates the effectiveness of land use-transport arrangements and identify the level of integrated land use transport system expected to result in overall trip reduction and mode shift in favor of public transit.

As indicated in the public transport proposals, the major travel corridors have been identified on the basis of major trip generation which is a function of land use. As such, the city fares at LOS 1 for this SLB.

4.13.10. LOS of Financial Sustainability of Public Transport

The financial sustainability of the public transport system is a very important parameter for continual services. To ensure financial sustainability, high travel demand corridors have been selected for mass rapid transit system. All the secondary corridors are left for demand-oriented city bus and midi bus services. It is expected that Jaipur will be placed at LOS 1 in this SLB.

CHAPTER – 5
IMPLEMENTATION PLAN

5. IMPLEMENTATION PLAN

5.1. PREPARATION OF IMPLEMENTATION PROGRAM

5.1.1. Unit Rates Adopted

The CMP recommends proposals for public transport system improvement, road network development, pedestrian facilities, non-motorised transport improvement, junction improvement etc. to cater to expected passenger travel demand up to the horizon year 2055. Broad cost estimates have been worked out to assess the requirement for funds for these proposals. Unit rates of different components have been adopted from previous CMPs/ other studies (**Table 5.1)**.

The proposals of other agencies like NHAI, JDA, Railways etc. have been integrated in the CMP proposals and the costing of these proposals, taken from respective agencies, have been included in CMP costing.

TABLE 5.1 UNIT RATES CONSIDERED IN CMP

S. NO.	PROPOSALS	UNITS	UNIT RATE (Rs. IN CRORE)
1	**Public Transport Improvement Proposals**		
a	Mass Rapid Transit (MRT) Corridors	per Km	**350**
b	Electric Buses - Standard	per Bus	1.75
c	Electric Buses - Midi	per Bus	1.0
d	Bus Terminal and Depot	per terminal	50.0
e	Bus E-charging stations	per location	3.0
f	Bus shelters development and upgradation	per location	0.6
g	Auto e-charging stations	per location	1.0
h	Battery swapping stations	per location	1.5
2	**Terminals**		
a	Freight Terminals	per terminal	60.0
b	Truck LayByes	per location	5.0
3	**Road Improvement Projects**		
a	Outer Ring Road (6 lane c/w) (NHAI Proposal)	sq. m	0.0005
b	Road Widening	sq. m	0.0008
c	Rail Over Bridge/ Under Bridge (4 lane c/w)	per location	70.0
d	Flyovers/underpasses	per Km	120.0
4	**NMT Infrastructure**		
a	Footpath (1.5-2.5 m wide)	Per sqm	0.0001
b	NMV Lane (2-3 m wide)	Per sqm	0.00012

c	Pedestrian Crossing Facilities	per sqm	0.3
d	Pedestrian Grade Separated Facilities	per location	2.0
e	Public Bike Sharing	per location	0.3
5	**Geometric Improvement of Junctions**	Per location	0.9
6	**Parking**		
a	Multilevel Parking (RITES Proposal)	ECS	800000.0
b	Parking Zones (mandatory signages)	per no.	0.3
c	On-street Parking	per no.	0.4
7	**Integrated Command & Control Centre and SCOOT**	per location	50.0
a	Adaptive Traffic Signal Junction	per location	1.0

Source: Tentative Per Unit Rate based on previous CMP/ other studies, cost of land not included

Based on the above unit rates, with reference to the Integrated Schedule of Rates (SoR), Government of Rajasthan; Rates shared by Jaipur Development Authority (JDA) and the Consultants' experience in various similar kinds of past studies, cost estimates of proposal schemes have been worked out and are given in **Table 5.3** respectively. As the proposals would be implemented in phases, the requirement of funds is also given phase-wise. The requirement of funds has been suggested in three phases (2025-31, 2031-41 & 2041-55) in accordance with the implementation plan of proposals.

5.2. PRIORITIZATION OF SUB-PROJECTS

5.2.1. Public Transport Projects

The Public Transport projects have been identified and detailed in Chapter 4. The proposals include MRTS corridors, city bus & feeder bus routes, IPT/Paratransit system requirement. Apart from these, supporting infrastructure such as bus terminals and depots are also proposed which need to be developed in synchronization with the public transport network. **Table 5.2** gives the phasing of sub-projects under public transport.

5.2.2. Road Infrastructure Improvement Projects

Road infrastructure improvement includes improvement & augmentation of rail over/ under bridge, new road construction, flyovers/elevated roads, Outer Ring Road. Junctions have also been identified for geometric improvements. NMT infrastructure shall also be developed which includes footpaths, NMV lanes, pedestrian crossing facilities, and public e-bike sharing facilities. **Table 5.2** gives the phasing of sub projects under road infrastructure improvement.

5.2.3. Parking

CMP proposes parking locations in the city for development of Multilevel Parking, on street parking. **Table 5.2** gives the phasing of Parking projects.

5.2.4. Freight Terminals

The freight terminals/ truck terminals have been proposed at the periphery of the city in different locations. **Table 5.2** gives the phasing of subprojects under Freight terminals.

TABLE 5.2 PHASING OF CMP PROJECTS FOR JAIPUR CITY

S. No.	Proposals	Quantity (Total)	Quantity		
			Phase I (2025-31)	Phase II (2031-41)	Phase III (2041-55)
1	Public Transport Improvement Proposals				
a	Mass Rapid Transit (MRT) Corridors	138.1	42.8	57.8	37.5
b	Electric Buses - Standard	650.0	325.0	180.0	145.0
c	Electric Buses - Midi	550.0	225.0	200.0	125.0
d	Bus Terminal and Depot	10.0	6.0	4.0	0.0
e	Bus E-charging stations	11.0	5.0	3.0	3.0
f	Bus shelters development and upgradation	300.0	150.0	100.0	50.0
g	Auto e-charging stations	14.0	8.0	3.0	3.0
h	Battery swapping stations	14.0	5.0	5.0	4.0
2	Terminals				
a	Freight Terminals	4.0	2.0	2.0	0.0
b	Truck LayByes	8.0	4.0	4.0	
3	Road Improvement Projects				
a	Outer Ring Road (6 lane c/w) (NHAI Proposal)	2079000	2079000		
b	Road Widening	1082500	625000.0	457500.0	0.0
c	Rail Over Bridge/ Under Bridge (4 lane c/w)	9.0	5.0	4.0	0.0
d	Flyovers/underpasses	10.0	5.0	2.5	2.5
4	NMT Infrastructure				
a	Footpath (1.5-2.5 m wide)	51000.0	30000.0	21000.0	
b	NMV Lane (2-3 m wide)	32000.0	11000.0	21000.0	
c	Pedestrian Crossing Facilities	17.0	17.0		
d	Pedestrian Grade Separated Facilities	19.0	11.0	8.0	
e	Public Bike Sharing	14.0	8.0	6.0	
5	Geometric Improvement of Junctions	25.0	25.0		
6	Parking				
a	Multilevel Parking (RITES Proposal)	600.0	600.0		
b	Parking Zones (mandatory signages)	100.0	75.000	25.00	
c	On-street Parking	7.0	7.00		
7	Integrated Command Control Centre & SCOOT	1.0	1.00		
	Adaptive Traffic Signal Junction	50.0	25.00	25.00	

The broad cost estimates of all the projects are given in **Table 5.3**.

5.3. LIMITATIONS OF COST ESTIMATES

The investment and cost details presented in this report are preliminary in nature and are intended to be used as **reference information only**. The following limitations apply to these estimates:

- Land Acquisition (LA) costs are not included.
- Rehabilitation and Resettlement (R&R) costs and utility shifting costs have not been considered.
- The unit rates adopted are based on a macro-level assessment and should be treated as indicative estimates only.
- Detailed cost estimates may be undertaken separately during the Feasibility Study, Detailed Project Report (DPR), or Detailed Design stage, as applicable.

5.4. FUNDING OF PROJECTS & MONITORING OF CMP

To meet the transport needs of the future, investment requirements will increase to levels three to four times higher in real terms from the present levels. The financing of this level will be a massive task. While the government will continue to be a major source of funds for infrastructure, internal generation of resources by the sector itself will have to increase. Pricing of transport services and reduction in the costs will have to play a much bigger role than in the past.

A larger role of the private sector is also visualized. In a maze of subsidies and social service obligations, public sector transport has lost the importance of commercial operations. Urban transport Policy of the Ministry of Housing & Urban Affairs, GoI clearly indicates the areas and levels of possible government support in 'planning to implementation of urban transport components'. There are certain areas of urban transport components that different stakeholders can participate so that the required funding and responsibilities can be shared with suitable coordination and regulation mechanism. Considering the funding pattern, legal aspects, implementation capacity, return potential, risks associated etc., urban transport components can be grouped for implementation. Projects in the study area can be implemented by:

i. Local bodies
ii. Local bodies with the fund support of State and Central governments
iii. Local bodies with the fund/technical support of multilateral funding agencies
iv. State or Central governments
v. Local bodies with the support of private participation
vi. Private participation

TABLE 5.3 PHASEWISE BROAD COSTING OF CMP PROJECTS FOR JAIPUR CITY

S. No.	Proposals	Units	Quantity (Total)	Quantity			Cost (In Cr)			Total Cost (Rs in Crore)
				Phase I (2025-31)	Phase II (2031-41)	Phase III (2041-55)	Phase I (2025-31)	Phase II (2031-41)	Phase III (2041-55)	
1	**Public Transport Improvement Proposals**									
a	Mass Rapid Transit (MRT) Corridors	per Km	138.1	42.8	57.8	37.5	14980.0	20230.0	13125.0	48335.0
b	Electric Buses - Standard	per Bus	650.0	325.0	180.0	145.0	568.8	315.0	253.8	1137.5
c	Electric Buses - Midi	per Bus	550.0	225.0	200.0	125.0	225.0	200.0	125.0	550.0
d	Bus Terminal and Depot	per terminal	10.0	6.0	4.0	0.0	300.0	200.0	0.0	500.0
e	Bus E-charging stations	per location	11.0	5.0	3.0	3.0	15.0	9.0	9.0	33.0
f	Bus shelters development and upgradation	per location	300.0	150.0	100.0	50.0	90.0	60.0	30.0	180.0
g	Auto e-charging stations	per location	14.0	8.0	3.0	3.0	8.0	3.0	3.0	14.0
h	Battery swapping stations	per location	14.0	5.0	5.0	4.0	7.5	7.5	6.0	21.0
2	**Terminals**									
a	Freight Terminals	per terminal	4.0	2.0	2.0	0.0	120.0	120.0	0.0	240.0
b	Truck LayByes	per location	8.0	4.0	4.0		20.0	20.0	0.0	40.0
3	**Road Improvement Projects**									
a	Outer Ring Road (6 lane c/w) (NHAI Proposal)	sq. m	2079000	2079000			1040.0	0.0		1040.0
b	Road Widening	sq. m	1082500	625000	457500	0.0	500.0	366.0	0.0	866.0
c	Rail Over Bridge/ Under Bridge (4 lane c/w)	per location	9.0	5.0	4.0	0.0	350.0	280.0	0.0	630.0
d	Flyovers/underpasses	per Km	10.0	5.0	2.5	2.5	600.0	300.0	300.0	1200.0
4	**NMT Infrastructure**									0.0
a	Footpath (1.5-2.5 m wide)	Per sqm	51000.0	30000.0	21000.0		30.0	21.0	0.0	51.0
b	NMV Lane (2-3 m wide)	Per sqm	32000.0	11000.0	21000.0		11.0	21.0	0.0	32.0
c	Pedestrian Crossing Facilities	per sqm	17.0	17.0			5.1	0.0	0.0	5.1
d	Pedestrian Grade Separated Facilities	per location	19.0	11.0	8.0		22.0	16.0		38.0
e	Public Bike Sharing	per location	14.0	8.0	6.0		2.0	1.5		3.5
5	**Geometric Improvement of Junctions**	Per location	25.0	25.0			22.5	0.0		22.5
6	**Parking**									0.0
a	Multilevel Parking (RITES Proposal)	ECS	600.0	600.0			48.0			48.0
b	Parking Zones (mandatory signages)	per no.	100.0	75.000	25.00		18.8	6.3		25.0
c	On-street Parking	per no.	7.0	7.00			2.8			2.8
7	**Integrated Command Control Centre & SCOOT**	per location	1.0	1.00			50.0			50.0
	Adaptive Traffic Signal Junction	per location	50.0	25.00	25.00		25.0	25.0		50.0
	Total						**19035.9**	**22176.3**	**13851.8**	**55063.9**

5.4.1. Implementation Mechanism

The possible areas of the urban transport projects for various implementation agencies are presented in **Table 5.4**. Low capital intensive with moderate technical requirements and high social responsibility projects can be taken up by ULBs. High capital intensive and more technical required projects like High-Capacity Bus System and structural projects shall be through the co-operation of State and Central governments on SPV format with loan from multilateral funding agencies. Projects with overlapping responsibilities but with high return potentials with less risk and less gestation period shall be through private sector by BOT/Annuity formats. Private sector participation will be in the areas of high profitability with less/medium risks. Hence it is necessary to identify the appropriate areas for different types of private sector participation for implementing urban transport components. Private sector involvement in urban transport components can be in following forms:

- Projects with social responsibility on sponsorship pattern (eg: improvement and maintenance of junctions).
- Annuity format of BOT projects which have less return potentials and high capital intensive (e.g. Development and maintenance of City Roads in Trivandrum City).
- Commercial projects BOT projects (e.g. Coimbatore Bypass in Tamil Nadu, Bridge connecting Wellington Island and Mattancherry in Kochi in Kerala).
- PPP for urban bus services (e.g. AICTSL for Indore city bus operation for the bus services proposed for the Study Area)

5.4.2. Funding Models for Projects Implementation

- **Metro system**

The financing option for Metro implementation depends upon selection of the dedicated agency created to implement the project. As per Metro Rail Policy, 2017, the prominent models are:

  - Equity Sharing Model – Special Purpose Vehicle fully under Government Control: Under this arrangement Government of India and State Government make equal equity contribution and run SPV as a commercial enterprise. As per the prevalent practice, Central Government contributes 20% of the project cost as their equity contribution. An equal amount can be contributed by State Government aggregating the total equity to 40%. Remaining 60% is arranged as soft loan from funding agencies.

  - Public Private Partnership – Design, Build, Finance, Operate & Transfer with Viability Gap Funding (VGF): The fundamental principle underlying Public

Private Partnerships (PPP's) as a development option for any infrastructure project is to combine the strengths of the private sector with those of the public sector in order to overcome challenges faced during construction & operation and to achieve better outcomes.

- Grant by the Central Government with Private Participation during Implementation - Supply, Operate & Transfer with Fixed Fee: Under this option Central Government would fund 10% of the project completion cost excluding private investment Land, R&R and state taxes. Remaining cost is to be borne by state with Private sector participation

It has been observed that the contribution of Governments under SPV model is least. Moreover, in VGF model, the entire revenues for the Concession Period accrues to the Private Partner with no return on Government's contribution. Hence, Equity Sharing Model is preferred for MRTS funding model for project implementation.

- **Bus Routes Operation**

PPP in bus services in India have been prevalent for many years now, but they have gained momentum in the last two decades. Concept of PPP in Bus services started when several small and medium sized cities that lacked technical and financial resources, initiated Bus services for the first time. PPPs emerged a way to combine Authority's expertise in planning and managing a bus service with Service Provider's capabilities to access the finance and introduce cost effectiveness in bus operation and maintenance (O&M). Between the two extremes of public monopoly and complete private sector licensing, two broad forms of contracting mechanism under PPP are identified as:

- Gross Cost Contract Model and Net Cost Contract Model.

With pursuant to the above specific envisaged features, Models for operation of buses under PPP are shortlisted and analyzed below:

GROSS COST CONTRACT (GCC)	NET COST CONTRACT (NCC)
• Service Provider is responsible for procurement, operation, management and maintenance of Buses. • Authority keeps the right to collect the fare and non-fare revenue from buses. • Authority pays a payment to the private party based on fixed hourly or per km fee.	• Service Provider is responsible for procurement, operation, management and maintenance of Buses. • Right to collect the Fare and Non-Fare Revenue from Buses is entrusted to the Service Provider. • Service Provider pays a premium or receive a grant per km from Authority.

Out of the two model GCC is preferrable funding model.

- **Development of Terminals (Bus/Freight)**

The development of bus and freight terminals may be undertaken through suitable Public–Private Partnership (PPP) frameworks to ensure efficient delivery, optimal risk sharing, and long-term operational sustainability. Among the commonly adopted PPP models are:

- Engineering, Procurement and Construction (EPC) model, wherein the public authority retains responsibility for financing and operations
- Build–Operate–Transfer (BOT) model, which involves private sector participation in construction and operation for a defined concession period;
- Design–Build–Finance–Operate–Transfer (DBFOT) model.

The DBFOT model is generally preferred for terminal development, as it integrates design, construction, financing, and operations under a single concessionaire, promotes innovation and efficiency, and reduces lifecycle costs while ensuring improved service quality and asset maintenance over the concession period.

- **Development of Multilevel Parking and Public Bike Sharing**

The development of multilevel parking facilities may be undertaken through appropriate Public–Private Partnership (PPP) models to address urban parking demand in an efficient and financially viable manner. Commonly adopted models include the EPC model, wherein construction is carried out by a private contractor with public funding and subsequent operation by the authority, and the Build–Operate–Transfer (BOT) model. The BOT model is generally preferred for multilevel parking projects, as it enables private sector participation in financing, construction, and operation, ensures better asset management during the concession period, and reduces the financial burden on the public authority.

- **Development of Public Bike Sharing**

Public Bike Sharing (PBS) systems are typically implemented through a hybrid PPP model, combining public support in the form of Viability Gap Funding (VGF) with private sector participation in operations and maintenance. Under this model, the public authority supports initial capital expenditure and system rollout, while the private operator is responsible for day-to-day operations, maintenance, and service quality. This approach has been widely adopted, as it ensures financial sustainability, operational efficiency, and scalability of the bike-sharing system while promoting non-motorized and sustainable urban mobility

TABLE 5.4 POSSIBLE AREAS OF URBAN TRANSPORT PROJECT COMPONENTS FOR IMPLEMENTATION BY VARIOUS AGENCIES

Urban Transport Component	Potential Role Players /Agencies						
	ULB	State	Central Govt.	Multilateral Funding Agencies	Private Sector Sponsorship	Private Sector (Annuity)	Private Sector (BOT)
i. Urban Roads							
1. Road Construction and improvement		■	■				
2. Development of Ring Road		■	■				■
3. Road Over Bridge/River Over Bridge		■	■				
4. Elevated Roads/Flyovers/Underpass		■	■				
ii Traffic Improvements							
1. Junction improvements	■	■	■		■		
2. Parking (On-street/Multilevel)	■				■		
3. Road Information System	■				■		■
4. Bus Stops	■						■
iii Public Transport System							
1. Bus transport system (Intra -city)	■	■					■
2. Bus transport system (Inter -city)		■					■
3. MRTS	■	■	■	■			
iv. IPT							
1.Regulations (licensing, parking, routing, etc)	■	■					
2.Terminals	■	■		■			■
v. Pedestrian Facilities							
1. Footpaths & Cycle Tracks	■	■		■			
2. Pedestrian facilities (FOBs)	■	■					
3. Public e-bike sharing	■	■			■		
vi. Terminals							
1. Bus	■	■					■
2. IPT	■						
vii. Freight		■	■				■
vii. Multilevel Parking	■	■					■

5.4.3. Indirect sources for funding Urban Transport infrastructure

A number of reports by various organizations have drawn attention to the indirect values created by transportation projects, suggesting that these could be tapped for potential funding of the projects themselves. Among the indirect benefits identified in these reports, the two most important are:

Transit Oriented Development and Land Value Capture: Investments in urban transport lead to higher property values in developed areas (and to higher municipal rates linked to those properties), to greater orientation of development along transit directions, to better anchors for land use planning, etc. Not only do private property owners gain indirectly from higher values of their holdings around new infrastructure, sometimes their rights to develop their properties are also gifted freely by cities and transit systems hoping to boost ridership.

According to various studies, the value is estimated at between 5% - 10% for residential properties, and between 10% - 30% for commercial properties. To generate funding from the value created in the proximity zones, a 'Betterment Levy' or 'Land Value Tax' can be imposed. This tax is aimed at landowners as it focuses on land value rather than property value. The tax is designed to capture the value created by the provision of public services surrounding the areas in which the services have been provisioned.

Revenue estimation investigates and assesses the potential revenue generation that may be derived from the transit-oriented development planning initiatives along the high-capacity bus corridor through various value capture techniques. Revenue from TOD planning initiatives may be generated through various ways like sale of additional FSI, revenue from stamp duty, property tax, sale of premium towards ancillaries, development charges etc.

Property development is the key factor in determining success of a High-Capacity Bus system. Evidence continues to mount that transit can generate tremendous value by concentrating development and activity around stations, and that this value can be captured and used to fund station area improvements and community benefits. Process of property development requires land, labour, capital, entrepreneurship and management as major inputs.

Development Rights granted by cities to the areas near the transportation project, either at very low cost to owners or in some cases free. These benefits could instead be held in escrow by the transport project itself and made available to property owners on a paid basis, with the money earned through such transactions available to under-write a portion of the project costs.

Fuel Cess: Another source of income is from private vehicles through taxes levied on their consumption of fuel. Typically, cities can add taxes or cess applicable within their jurisdiction, collecting money for use in making improvements to public transport schemes. Given the rising use of private vehicles, and the large amounts of money that can be collected by even a small cess on fuel purchases, this could be an important source of money for cities.

Urban Transport Tax: Urban Transport Tax or Cess may be levied on the purchase of new cars and two wheelers.

Carbon Credits: Another source of funds that has emerged in recent years is carbon credits, typically traded between industrialized countries that operate at high levels of per-capita pollution, and less industrialized economies where the per-capita climate impacts are much smaller. In the short run, these credits allow richer economies to phase out their shift from carbon-intensive production, and also allow poorer countries to source funds for their project needs. Credits are also available for countries' willingness to choose less carbon-intensive choices for their own industries, and some Indian entities (e.g. bus operators in some states) are examining ways of seeking such credits for the use of biodiesel in their vehicles. However, the overall trading scenario around such credits is full of uncertainty and is likely to be determined by global climate talks. Wherever they are available, however, they can be tapped to augment other sources of funds.

Unified Mobility Card (UMC): The Unified Mobility Card (UMC) presents significant opportunities for generating non-fare revenue while strengthening integrated urban mobility in Jaipur. Revenue can be generated through partnerships with banks and financial institutions for card issuance, co-branding, and revenue sharing on transaction fees. The UMC ecosystem also enables float income from stored-value balances, interest earnings, and settlement efficiencies. Additional revenue streams may be realized through merchant integrations, allowing the card to be used for parking, retail outlets, last-mile services, and civic amenities, with a share of transaction commissions accruing to the implementing agencies. Advertising and branding rights on physical cards, mobile applications, and associated infrastructure further provide monetization opportunities.

EV Charging and Battery Swapping Stations: Electric vehicle (EV) charging and battery swapping infrastructure offers multiple direct revenue opportunities through user-based charges such as pay-per-use tariffs (per kWh or time-based), per-swap fees, and subscription or leasing models for commercial fleets including e-buses, e-autos, taxis, and last-mile delivery vehicles. Battery swapping, in particular, enables predictable and recurring revenue due to high utilization by fleet operators. Public agencies can further monetize these facilities through PPP or concession models, wherein private operators invest, operate, and share revenues via license fees, fixed annuities, or

revenue-sharing mechanisms. In addition, ancillary and indirect revenue streams, such as land monetization at depots, terminals, parking areas, and transit hubs through leasing space for charging equipment and allied infrastructure, can significantly enhance financial viability.

Urban Transport Fund (UTF): As recommended in the NUTP, states and cities are being encouraged to set up UTFs in order to receive dedicated revenues to be used exclusively for meeting the needs of urban transport. The NUTP mentions some of the potential revenue sources for such UTFs, which include a supplement to the petrol and diesel taxes, a betterment levy on landowners, and tax on employers etc.

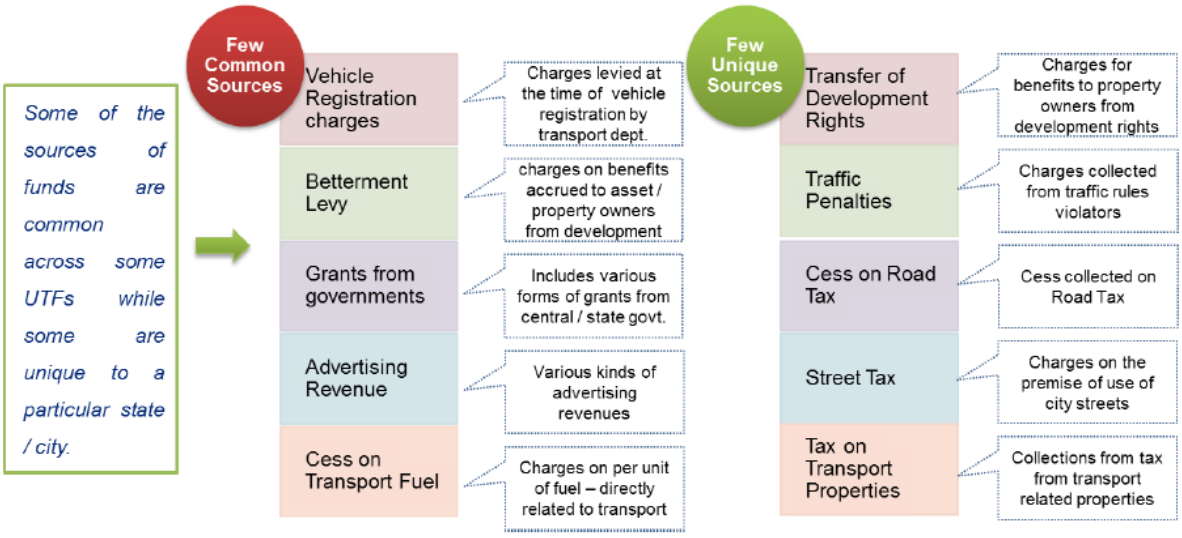
Four options for geographical coverage of an UTF have been identified: UTF at the state level for the whole state; UTF for a particular municipal / urban area; UTF at the state level for urban areas that do not have their own UTF or UTF for UMTA jurisdiction.

There are multiple advantages of having UTF at municipal / urban area level. One is that the funds are specifically available for meeting the urban transport needs of a single city. Another is that the amount of funding is better known at the local level than at the state level and therefore a UTF at a municipal / urban area will allow for better planning. Third is that the use of the funds can better be prioritised according to the local needs. Since it is envisaged that UMTA should be established at municipal levels, the preferred option is to have UTF with jurisdiction similar to UMTA jurisdiction.

Different sources of funds have been identified by different states while setting up UTFs. In most of the UTFs, a major source of funding is from the Government. This has taken different forms such as budgetary allocations, government grants, grants through schemes etc. Several other sources of funds have been identified to supplement funding from government resources.

Some of these sources of funds are common across various UTFs while others are less common. For example, cess on vehicle registration is used as a common source of funding in many of the UTFs. Similarly, betterment levy (which is also a suggested source of fund in the NUTP) is one of the common sources in some of the UTFs. An example of a less common source of funding is a premium charged on Transfer of Development Rights (TDR) which is used by Pimpri Chinchwad Municipal Corporation. In some of the UTFs, there are provisions of receiving funds from international funding agencies such as World Bank, ADB etc.

Sources of funds are summarised below.



5.5. ACTION PLAN AND BUDGET PLAN

The implementation of all the proposals made under Transport System Plan require number of activities to be undertaken by Jaipur Development Authority, State Government and other concerned organizations. It is important that a multi-pronged effort is initiated on all fronts to enable speedy, concerted and coordinated action. The following agenda for action is suggested:

- Approval of CMP by Development Authority; and other concerned state government departments / agencies and MoHUA, GOI
- Preparation of Detailed Project Reports for all projects recommended, tendering, and award of contract, construction and project management
- Mobilization of resources from various sources
- Set up of Jaipur Transport Development Fund
- Budget allocation for projects
- Identification and selection of Private Sector enterprise for projects to be developed under PPP model.
- Identification of land for the various components of the Plan (road widening, parking areas, terminals, depots, etc.)
- Establishment of Unified Metropolitan Transport Authority (UMTA).
- Strengthening logistics support to Traffic Police
- Review and revision of Transport Policies and Transport Plan on a periodic basis (every 5 years)
- Promotion and facilitation of private sector participation in all components of Transport Plan (Roads, Parking Facilities, Terminals, Public Transport, etc.)
- Private sector Involvement in development, operation and management of parking areas (both on street and off-street).
- Wide publicity and public education programs

ANNEXURES

ANNEXURE 1.1

LIST OF PROPOSED JCTSL BUS SHELTERS

प्रस्तावित 150 नवीन बस क्यू शैल्टर्स सूची (नगरीय क्षेत्र)					
Sr.N	बस स्टॉप का नाम	वांछित संख्या	मार्ग का नाम	जेसीटीएसएल वर्त्तमान संचालित मार्ग	Urban/ Sub Urban
1	टोडी मोड	2	सीकर रोड	1	Urban
2	हरमाडा	2	सीकर रोड	1	Urban
3	नींदड मोड	2	सीकर रोड	1	Urban
4	अनोखा गांव	2	सीकर रोड	1	Urban
5	चौमू पुलिया	1	सीकर रोड	1,1A,Ac-2	Urban
6	पानीपेच	2	सीकर रोड से स्टेशन रोड की तरफ	1,1A,Ac-2	Urban
7	पीतल फैक्ट्री	2	पानीपेच से चांदपोल की तरफ	1A,15,9A,24	Urban
8	चिंकारा कैंटीन	2	सीकर रोड से स्टेशन रोड की तरफ	1,Ac-2	Urban
9	चांदपोल	2	संसार चन्द रोड एवं पावर हाउस रोड	1,1A,24.15,9A	Urban
10	ट्रांसपोर्ट नगर	2	फ्लाईओवर के पास एवं शांति पथ रोड के पास,आगरा रोड	3,7,1A,14,27,32	Urban
11	रामबाग सर्किल	1	टोंक रोड	3,3A,16,27,14,23A,25A,25B,11,Ac-1,Ac-2,7,9A,28,34,Ac-7,6A,32	Urban
12	लालकोठी नगर निगम	1	टोंक रोड	3,3A,16,27,23A,25A,25B,11,Ac-1,Ac-2,7,9A,28,34,Ac-7,6A,32	Urban
13	गांधीनगर मोड	2	टोंक रोड	3,3A,16,27,23A,25A,25B,11,Ac-1,Ac-2,7,9A,28,34,Ac-7,6A,32	Urban
14	टोंक फाटक	1	टोंक रोड, दुर्गापुरा जाने की तरफ	3,3A,16,27,23A,25A,25B,11,Ac-1,Ac-2,7,9A,28,34,6A,32	Urban
15	सैयद का गटटा	1	टोंक रोड,अजमेरी गेट जाने की तरफ	3,3A,16,27,23A,25A,25B,11,Ac-1,Ac-2,7,9A,28,34,32	Urban
16	गोपालपुरा	2	टोंक रोड	3,3A,16,27,23A,25A,25B,11,Ac-1,Ac-2,7,9A,28,34,32	Urban
17	महावीर नगर	2	टोंक रोड	3,3A,16,27,,25A,25B,11,Ac-1,Ac-2,,9A,28	Urban
18	दुर्गापुरा	2	टोंक रोड	3,3A,16,27,,25A,25B,11,Ac-1,Ac-2,,9A,28	Urban
19	बी2बाईपास जंक्शन	2	टोंक रोड	3,3A,16,27,,25A,25B,11,Ac-1,Ac-2,28	Urban
20	राम मंदिर	1	टोंक रोड	3,3A,16,27,,25A,25B,11,Ac-1,Ac-2,28	Urban

21	कल्याण नगर	1	टोंक रोड	3,3A,16,27,,25A,25B,11,Ac-1,Ac-2,28	Urban
22	गौशाला	1	टोंक रोड	3,16,27,25A,25B,11,Ac-2	Urban
23	सैक्टर 3 प्रताप नगर	2	टोंक रोड	3,16,27,25A,25B,11,Ac-2	Urban
24	सैक्टर 5 प्रताप नगर	1	टोंक रोड	3,16,27,25A,25B,11,Ac-2	Urban
25	गोनेर	1	गोनेर	16,27,25A,25B,11,Ac-2	Urban
26	द्वारिकापुरी	2	प्रताप नगर,टोंक रोड	27	Urban
27	महात्मा गांधी अस्पताल	2	सीतापुरा,टोंक रोड	11,AC-2	Urban
28	विधानी चौराहा	2	सीतापुरा,महल रोड	11,AC-2	Urban
29	पूर्णिमा यूनिवर्सिटी	2	सीतापुरा,गोनेर रोड	11	Urban
30	टोल टैक्स,बंबाला पुलिया	2	टोंक रोड	16,27,25A,25B,11,Ac-2	Urban
31	बारह मील	2	टोंक रोड	16,27,25A,25B,11	Urban
32	गोनेर मोड	2	टोंक रोड	16,27,25A,25B,11	Urban
33	कैलगिरी मोड	2	मालवीय नगर	6A	Urban
34	जीपीओ	2	एम.आई.रोड	6A,1A,Ac-2,9A,Ac-7	Urban
35	झोटवाडा	2	खिरणी फाटक रोड	14,Ac-2	Urban
36	सोडाला	2	अजमेर रोड	14,26	Urban
37	खिरणी फाटक पुलिया	2	अजमेर रोड,रेलवे लाइन के दोनो तरफ	6A,7	Urban
38	पांच्यावाला	2	अजमेर रोड,सिरसी रोड	7,Ac-8	Urban
39	बजरी मंडी पुलिया	2	अजमेर रोड	7	Urban
40	करणी पैलेस	2	अजमेर रोड	7	Urban
41	चित्रकूट पुलिया	2	अजमेर रोड	7	Urban
42	हीरापुरा	2	अजमेर रोड	7,26	Urban

43	मानसरोवर मैट्रो स्टेशन	2	बदरवास चौराहे से गुर्जर की थडी की तरफ	7,32	Urban
44	गुर्जर की थडी	2	अण्डरपास के आगे	7,32	Urban
45	महेश नगर मोड	2	गोपालपुरा बाईपास रोड	7,32	Urban
46	रिद्धी सिद्धी चौराहा	2	गोपालपुरा बाईपास रोड	7,32	Urban
47	त्रिवेणी नगर	2	गोपालपुरा बाईपास रोड	7,32	Urban
48	त्रिमूर्ति सर्किल	1	गोविंद मार्ग	7	Urban
49	राजापार्क	1	गोविंद मार्ग	7	Urban
50	गुरुद्वारा मोड	1	गोविंद मार्ग	7	Urban
51	प्रेम नगर	2	आगरा रोड	14,32	Urban
52	पुरानी चूंगी	2	आगरा रोड	14,32	Urban
53	52 फीट हनुमान जी	2	आगरा रोड	14,32	Urban
54	बगराना डिपो	2	आगरा रोड	14,32	Urban
55	दादी का फाटक	2	दादी का फाटक	9A	Urban
56	मुरलीपुरा	2	केडिया पैलेस रोड	9A	Urban
57	विद्याधर नगर	2	विद्याधर नगर रोड	9A	Urban
58	शास्त्री नगर	2	विद्याधर नगर रोड	9A	Urban
59	पानी की टंकी	2	विद्याधर नगर रोड	9A	Urban
60	महारानी फार्म	2	विद्याधर नगर रोड	9A	Urban
61	कमला नेहरु नगर	2	अजमेर रोड	26,32	Urban
62	रामनगरिया चोराहा	2	महल रोड, जगतपुरा	New Route	Urban
63	हल्दीघाटी चौराहा(महल रोड)	2	महल रोड	11A	Urban
64	अक्षयपात्र चौराहा	2	महल रोड	11A	Urban

65	निवारू	2	निवारू रोड	10 B	Urban
66	पन्नाधाय सर्किल	2	हल्दीघाटी मार्ग	11A	Urban
67	बैनाड स्टेशन	2	बैनाड	New Route	Urban
68	चुगी, दिल्ली रोड	2	दिल्ली रोड	34,30	Urban
69	मुहाना मंण्डी, मुहाना	2	मुहाना रोड	23	Urban
70	पत्रकार कॉलोनी	2	पत्रकार कॉलोनी	23	Urban
71	केसर चौराहा	2	केसर चौराहा	23	Urban
72	हल्दीघाटी सेक्टर–3	2	टोंक रोड	16,27,25A,25B,11,Ac-2	Urban
73	कांटा चौराहा,झौटवाडा	2	कालवाड रोड	Ac-2,Ac-7, 24	Urban
74	जोशी मार्ग	1	कालवाड रोड	Ac-2,Ac-7, 24	Urban
75	रावण गेट	1	कालवाड रोड	Ac-2, 24	Urban
76	गोविन्दपुरा	2	कालवाड रोड	Ac-2, 24	Urban
77	हाथोज	2	कालवाड रोड	24	Urban
78	वी.के. आई रोड न. 14	2	सीकर रोड	15,1	Urban
79	वी.के. आई रोड न. 09	2	सीकर रोड	15,1,1A	Urban
80	वी.के. आई रोड न. 5	2	सीकर रोड	15,1,1A	Urban
81	अल्का सिनेमा	2	सीकर रोड	15,1,1A, 9A	Urban
82	अम्बाबाडी	1	सीकर रोड	Ac-2,Ac-7, 24,15	Urban
83	राममंदिर, रेल्वे स्टेशन	2	स्टेशन रोड	Ac-2,Ac-7, 1	Urban
		150			

ANNEXURE 2.1

JCTSL BUS ROUTES & FLEET DATA

Buses Operated from 2 depots(Todi Depot,Sikar Road & Bagrana Depot,Agra Road , Total Buses = 200, Alloted Schedule= 190 , Total Routes=26 All buses are Diesel Fuel Based											
S. No.	Route No.	Route Name (Operating Depot-TODI)	Type Of Bus	Bus Type	No. of Buses	Route Length (Km)	No. of Bus Stops	Freuency (In Minutes)	Bus size(meter)	Seating Capacity	passenger per day/ per bus
1	1	**Bheru khejda to Khole ke hanumanji** : Vai Harmada, Chomu Puliaralway,sindhicamp, Chandpole , Choti Chopar	NON AC	MIDI	6	27	30	28	9	24	422
2	AC 1	**Sanganer to Kukas:** Via - Sanganer Police Station, Tonk Fatak, Rambag, Ajmeri Gate, Sanganeri Gate, Badi Chopar, Ramgarh Mode, Jal Mahal, Amber Fort,kunda	AC	Low floor	9	32	25	24	12	39	416
3	9A	**Dadi Ka phatak to Agarwal Form :** Via - Vijay Path, Sipra Path, Maharani Form, Durgapura, Tonk Fatak, Rambag, Ajmeri Gate, Sanganeri Gate, Badi Chopar, Chandpole, Pital Factory, Shastri Nagar, Vidhyadhar Nagar, Alka Cinema, Road No. 1, Murlipura	NON AC	Low floor	16	28	35	12	12	39	775
4	7	**Khirni Phatak to Transport Nagar:** Via - Heerapura (New T.P. Nagar), Gaj Singh Pura, Kisan Dharm Kanta, Gurjar Ki Thadi, Triveni Nagar, Gopalpura, Rambhag, Narayan Singh Circle, Moti Dungri, Govind Marg, Mental Hospital	NON AC	Low floor	14	21	32	12	12	39	958
5	15	**Chandpole to Chomu:** Via - Chomu pulia', Khaitan, Road no 14, Rampura, Jetpura	NON AC	MIDI	6	32	20	30	9	24	467
6	32	**Bhankrota to vinayak Campus,Nayla**: Via - Gaj Singh Pura, Kisan Dharm Kanta, Gurjar Ki Thadi, Triveni Nagar, Gopalpura, Rambag, Narayan Singh Circle, kanota	NON AC	Low floor	6	42	40	44	12	39	587
7	28	**Ajmeri Gate to Renwal**: Via -Tonk Fatak, Durgapura, Sanganer Thana, muhana mode, balawala ,banyawali	NON AC	MIDI	8	31	32	22	9	24	498
8	14	**Chomu pulia to Bassi:** Via - Khatipura, Vaishali Nagar, Sodala, Rambagh, Ajmeri Gate, Transport Nagar, Kanota	NON AC	Low floor	13	47	33	20	12	39	702
9	26	**Chandpole to Bagru**: Via - Sodala, Purani Chungi, DCM, Heerapura, Bhankrota, Bad Ke Balaji, Dahmi Kala/Sanjhariya/ Toll plaja	NON AC	Low floor	8	34	25	23	12	39	597
10	24	**Chandpole to Kalwad :** Via - panipech, chomu puliya, jhotwada, Hathos	NON AC	MIDI	5	25	28	30	9	24	448
11	10B	**Niwaru to Galta Gate** : Via - T.P. Nagar, Jawahar Nagar Shanti Path, Tilak Nagar, JDA Circle, Rambag Circle, Shakar Bhawan, Sodala, ESI No. 4, Hasanpura, Chandpoul, Panipech, Jhotwara	NON AC	MIDI	2	28	32	80	9	24	315
12	23A	**Ajmeri gate to patrakar colony**;rambag,gopalpura,gurjar ki thadi,mansarovar, vt road ,baba paradise	NON AC	MIDI	1	17	18	120	9	24	304
					94						

S. No.	Route No.	Route Name (Operating Depot-Bagrana)	Type Of Bus	Bus Type	No. of Buses	Route Length (Km)	No. of Bus Stops	Freuency (In Minutes)	Bus size(meter)	Seating Capacity	passenger per day/ per bus
13	1A	**VKI (Road No. 17) toTransport Nagar:** Vai - nanda canteen, vki 9 no.,alka,Chomu Pulia, Amba Badi, Pani Pech, Pital Factory, Chandpole, Ajmeri gate	NON AC	MIDI	4	21	25	35	9	32	514
14	3A	**Sanganer to Choti Chopar :** Via - Sanganer Police Station, Durgapura, Tonk Fatak, Rambag, Ajmeri Gate	NON AC	MIDI	14	15	21	9	9	32	676
15	AC 2	**Joshi Marg to Mahatma Gandhi Hospital:** Via - Jhotwara, Choumu Pulia, Panipech, Railway Station, Chandpole, Badi Chopar, Ajmeri Gate, Rambag, Tonk Fatak, Durgapura, Sanganer Police Station, Pratap Nagar, Sitapura.	AC	MIDI	16	32	36	15	9	32	506
16	11	**Ajmeri gate to Goner**:- Durgapura , Sanganer, Goner mod,Vidhani	NON AC	MIDI	4	27	29	45	9	32	510
17	6A	**Khirni Phatak to Airport**:- Jhotwada, chomu pulia, Collectry, ajmerti gate , Tonk Phatak, Malviya nagar,Airport	NON AC	MIDI	4	26	38	48	9	32	429
18	3	**Dwarkapuri to Transport Nagar**: Via - Sanganer Police Station, Durgapura, Tonk Fatak, Rambhag, Ajmeri Gate , Sanganeri gate,	NON AC	MIDI	12	21	32	13	9	32	673
19	34	**JDA Colony to Aananda manglam city:** Via - Ramgarh Mode, Badi Chopar, Sanganeri Gate, Ajmeri Gate,Rambag,Tonk Fatak,, Gopalpura, Triveni pulia, Annanda Manglam City	NON AC	MIDI	7	28	30	30	9	32	630
20	AC 8	**Choti chopad to Mundiya ramsar**: Via - Chandpole, Railway Station,Hasanpura ,Khatipura, Bindayaka, Mundiya ramsar	AC	MIDI	5	23	23	28	9	32	462
21	AC 7	**Chomu puliya to Dantli Phatak**: Via - Sanganeri Gate,Ajmeri Gate,Gandhi Nagar Mode, rambag, jahalana, jagtpura, Dantli Phatak	AC	MIDI	8	25	29	22	9	32	454
22	30	**Badi Chopad to Ramgarh** : Via - Sobhash chok, Ramgad mode, Nai ki thadi, lali,	NON AC	MIDI	4	25	19	35	9	32	542
23	16	**Ajmeri Gate to Chaksu:** Via - rambag,durga pura,Sanganer Police Station, 12 Meel, Bilwa, Shivdas Pura, Sheetla	NON AC	MIDI	12	41	28	17	9	32	538
24	27	**Goner to Vatika**: Via - Luniyawas ,TP Nagar, Ghategate, Ajmeri Gate, Tonk Fatak, Durgapura, Sanganer Thana, Pratap Nagar, India Gate, 12 Meel, Ashawala, Bhatawala	NON AC	MIDI	4	47	48	60	9	32	571
25	25A	**Ajmeri Gate to Padampura**: SMS, Tonk Phatak,Sanganer thana, Bilwa, Shivdaspura, Padampura	NON AC	MIDI	1	34	29	180	9	32	483
26	25 B	**Ajmeri Gate to Titariya**: SMS, Tonk Phatak,Sanganer thana, Bilwa, Shivdaspura, Titriya	NON AC	MIDI	1	38	31	180	9	32	434
					96						
Total Operating Buses					190						
No of Spare buses= 10											
Total buses=200											

ANNEXURE 2.2

INTENSITY AND DIRECTIONAL DISTRIBUTION OF TRAFFIC AT SCREENLINE LOCATIONS

S. No.	LOCATION		FAST MOVING PASSENGER VEHICLES												GOODS VEHICLES					SLOW MOVING VEHICLES				Grand Total (Nos.)	Grand Total (PCU's)
			Car/Jeep/ Van	Taxi	2-Whlr	Auto	E-Auto	S. Auto	E-Rickshaw	Mini Bus	Intercity Bus	City Bus	School Bus	Total Fast	LCV	Truck	MAV	Tractor	Total Goods	Cycles	Rickshaw	Others	Total Slow		
	MB_01 -Khirni Phatak																								
1	16Hrs. Volume Count	AJMER To DELHI	8780	38	5971	198	5	73	15	58	17	22	24	15201	4129	1494	2608	193	8424	11	0	2	13	23638	35747
		DELHI To AJMER	8173	47	5640	155	1	81	13	61	13	27	10	14221	4209	1660	2614	171	8654	12	4	3	19	22894	35476
		Both Direction	16953	85	11611	353	6	154	28	119	30	49	34	29422	8338	3154	5222	364	17078	23	4	5	32	46532	71223
		Composition%	36.43	0.18	24.95	0.76	0.01	0.33	0.06	0.26	0.06	0.11	0.07	63.23	17.92	6.78	11.22	0.78	36.70	0.05	0.01	0.01	0.07	100.00	
	Morning Peak	Both Direction	1244	9	629	28	1	19	3	8	1	3	1	1946	715	204	334	29	1253	0	0	0	0	3199	4975
	1300 - 1400	Composition%	38.89	0.28	19.66	0.88	0.03	0.59	0.09	0.25	0.03	0.09	0.03	60.83	22.35	6.38	10.44	0.91	39.17	0.00	0.00	0.00	0.00	100.00	
	Evening Peak	Both Direction	1132	7	611	23	0	26	2	8	4	4	5	1822	779	217	387	12	1383	0	0	0	0	3205	5174
	1430 - 1530	Composition%	35.32	0.22	19.06	0.72	0.00	0.81	0.06	0.25	0.12	0.12	0.16	56.85	24.31	6.77	12.07	0.37	43.15	0.00	0.00	0.00	0.00	100.00	
	MB_02 SC-1 Jaipur Ajmer Road																								
2	16Hrs. Volume Count	AJMER To JAIPUR	17642	405	33185	3531	136	1240	1495	380	225	18	98	58355	1746	27	0	50	1823	526	42	23	591	60769	46444
		JAIPUR To AJMER	16626	458	33645	3516	115	935	1319	369	244	53	92	57372	1811	13	1	54	1879	584	83	2	669	59920	45421
		Both Direction	34268	863	66830	7047	251	2175	2814	749	469	71	190	115727	3557	40	1	104	3702	1110	125	25	1260	120689	91865
		Composition%	28.39	0.72	55.37	5.84	0.21	1.80	2.33	0.62	0.39	0.06	0.16	95.89	2.95	0.03	0.00	0.09	3.07	0.92	0.10	0.02	1.04	100.00	
	Morning Peak	Both Direction	2779	89	7013	437	12	155	230	63	29	8	12	10827	185	3	0	11	188	136	11	0	147	11162	7959
	0945 - 1045	Composition%	24.90	0.80	62.83	3.92	0.11	1.39	2.06	0.56	0.26	0.07	0.11	97.00	1.66	0.03	0.00	0.10	1.68	1.22	0.10	0.00	1.32	100.00	
	Evening Peak	Both Direction	2807	32	5053	548	16	156	251	60	39	0	10	8972	260	2	0	2	262	48	5	0	53	9287	7087
	1730 - 1830	Composition%	30.23	0.34	54.41	5.90	0.17	1.68	2.70	0.65	0.42	0.00	0.11	96.61	2.80	0.02	0.00	0.02	2.82	0.52	0.05	0.00	0.57	100.00	
	MB_03 SC-1 Tonk Road																								
3	16Hrs. Volume Count	BAJAJ NAGAR To SARASWATI COLONY	17867	1637	30465	3122	108	1636	1521	461	319	737	138	58011	1150	17	0	17	1184	160	0	17	177	59372	47990
		SARASWATI COLONY To BAJAJ NAGAR	19842	1963	31070	3759	115	1696	1451	387	275	792	108	61458	1289	13	5	15	1322	186	9	21	216	62996	51200
		Both Direction	37709	3600	61535	6881	223	3332	2972	848	594	1529	246	119469	2439	30	5	32	2506	346	9	38	393	122368	99190
		Composition%	30.82	2.94	50.29	5.62	0.18	2.72	2.43	0.69	0.49	1.25	0.20	97.63	1.99	0.02	0.00	0.03	2.05	0.28	0.01	0.03	0.32	100.00	
	Morning Peak	Both Direction	2526	366	5625	521	19	290	277	73	49	97	9	9852	140	1	0	4	141	37	0	2	39	10032	7735
	1000 - 1100	Composition%	25.18	3.65	56.07	5.19	0.19	2.89	2.76	0.73	0.49	0.97	0.09	98.21	1.40	0.01	0.00	0.04	1.41	0.37	0.00	0.02	0.39	100.00	
	Evening Peak	Both Direction	2843	311	4922	549	16	254	222	43	38	105	18	9321	178	2	0	3	180	32	0	3	35	9536	7568
	1700 - 1800	Composition%	29.81	3.26	51.61	5.76	0.17	2.66	2.33	0.45	0.40	1.10	0.19	97.75	1.87	0.02	0.00	0.03	1.89	0.34	0.00	0.03	0.37	100.00	
	MB_04 Dalda Factory Road																								
4	16Hrs. Volume Count	DURGAPUR To GREEN APARTMENT	7717	832	18084	1539	65	919	330	37	23	65	67	29678	627	0	0	36	663	210	14	16	240	30581	22263
		GREEN APARTMENT To DURGAPUR	8617	754	19872	1643	71	807	354	30	10	68	59	32285	654	0	0	45	699	292	20	10	322	33306	24027
		Both Direction	16334	1586	37956	3182	136	1726	684	67	33	133	126	61963	1281	0	0	81	1362	502	34	26	562	63887	46289
		Composition%	25.57	2.48	59.41	4.98	0.21	2.70	1.07	0.10	0.05	0.21	0.20	96.99	2.01	0.00	0.00	0.13	2.13	0.79	0.05	0.04	0.88	100.00	
	Morning Peak	Both Direction	1257	156	3540	236	9	109	39	5	3	11	5	5370	100	0	0	11	100	66	4	2	72	5542	3889
	0915 - 1015	Composition%	22.68	2.81	63.88	4.26	0.16	1.97	0.70	0.09	0.05	0.20	0.09	96.90	1.80	0.00	0.00	0.20	1.80	1.19	0.07	0.04	1.30	100.00	
	Evening Peak	Both Direction	1026	92	2756	258	10	129	48	1	0	12	14	4346	73	0	0	2	73	33	1	2	36	4455	3158
	1645 - 1745	Composition%	23.03	2.07	61.86	5.79	0.22	2.90	1.08	0.02	0.00	0.27	0.31	97.55	1.64	0.00	0.00	0.04	1.64	0.74	0.02	0.04	0.81	100.00	
	MB_05 SC1 Jagatpur Road																								
5	16Hrs. Volume Count	MALVIYA NAGAR To ROHINI NAGAR	19510	2252	28219	2496	33	854	131	156	36	33	193	53913	1260	128	55	52	1495	86	23	51	160	55568	43681
		ROHINI NAGAR To MALVIYA NAGAR	19982	2188	27833	2585	44	456	124	147	11	28	181	53579	1161	120	42	32	1355	85	0	16	101	55035	42902
		Both Direction	39492	4440	56052	5081	77	1310	255	303	47	61	374	107492	2421	248	97	84	2850	171	23	67	261	110603	86582
		Composition%	35.71	4.01	50.68	4.59	0.07	1.18	0.23	0.27	0.04	0.06	0.34	97.19	2.19	0.22	0.09	0.08	2.58	0.15	0.02	0.06	0.24	100.00	
	Morning Peak	Both Direction	2899	442	6507	327	4	127	18	22	0	6	16	10368	129	20	5	9	154	17	0	2	19	10541	7533
	0930 - 1030	Composition%	27.50	4.19	61.73	3.10	0.04	1.20	0.17	0.21	0.00	0.06	0.15	98.36	1.22	0.19	0.05	0.09	1.46	0.16	0.00	0.02	0.18	100.00	
	Evening Peak	Both Direction	3329	275	4391	438	10	92	30	11	3	6	9	8594	224	12	5	6	241	19	2	8	29	8864	6918
	1715 - 1815	Composition%	37.56	3.10	49.54	4.94	0.11	1.04	0.34	0.12	0.03	0.07	0.10	96.95	2.53	0.14	0.06	0.07	2.72	0.21	0.02	0.09	0.33	100.00	
	MB_06 MB_06 Sitapura Railway																								
6	16Hrs. Volume	CHOKHI DHANI To BEDWA KALAN	9362	1366	25009	840	57	353	602	246	189	374	94	38492	1160	107	297	81	1645	89	55	22	166	40303	31752

S. No.	LOCATION		FAST MOVING PASSENGER VEHICLES												GOODS VEHICLES					SLOW MOVING VEHICLES				Grand Total (Nos.)	Grand Total (PCU's)
			Car/Jeep/ Van	Taxi	2-Whlr	Auto	E-Auto	S. Auto	E-Rickshaw	Mini Bus	Intercity Bus	City Bus	School Bus	Total Fast	LCV	Truck	MAV	Tractor	Total Goods	Cycles	Rickshaw	Others	Total Slow		
	Count	BEDWA KALAN To CHOKHI DHANI	9447	1588	26719	659	43	553	578	368	149	271	85	40460	1123	84	253	73	1533	55	74	32	161	42154	32527
		Both Direction	18809	2954	51728	1499	100	906	1180	614	338	645	179	78952	2283	191	550	154	3178	144	129	54	327	82457	64279
		Composition%	22.81	3.58	62.73	1.82	0.12	1.10	1.43	0.74	0.41	0.78	0.22	95.75	2.77	0.23	0.67	0.19	3.85	0.17	0.16	0.07	0.40	100.00	
	Morning Peak	Both Direction	1159	236	8022	129	7	90	130	46	22	46	17	9904	118	8	23	15	149	15	13	6	34	10087	6581
	0845 - 0945	Composition%	11.49	2.34	79.53	1.28	0.07	0.89	1.29	0.46	0.22	0.46	0.17	98.19	1.17	0.08	0.23	0.15	1.48	0.15	0.13	0.06	0.34	100.00	
	Evening Peak	Both Direction	1539	176	5479	143	12	53	112	51	29	48	7	7649	161	10	24	6	195	21	1	1	23	7867	5591
	1800 - 1900	Composition%	19.56	2.24	69.65	1.82	0.15	0.67	1.42	0.65	0.37	0.61	0.09	97.23	2.05	0.13	0.31	0.08	2.48	0.27	0.01	0.01	0.29	100.00	

* Source: RITES Primary Survey 2025

ANNEXURE 2.3

INTENSITY AND DIRECTIONAL DISTRIBUTION OF TRAFFIC AT MID BLOCK LOCATIONS

S. No.			Fast Moving Passenger Vehicles													Total Goods Vehicles	otal Slow	Total	
			Car	TW	Auto/E-Rickshaw	Buses									Total Fast Passenger Vehicles			Vehicles	PCU's
						Long Distance Buses				Other Buses					Total Buses				
						Roadways Bus	RLPS	Pvt Buses	Total Long-Distance Buses	Total Mini Bus	Tempo Traveller	JCTSL	School Bus	Total Other Buses					
1	MB-01 Agra Jaipur Road																		
	24 Hrs.	From Jaipur	9243	6058	2910	265	72	371	708	77	79	0	10	166	874	19084	1384	199	20668	21866
	Volume Count	Towards Jaipur	11654	6726	5179	265	62	385	712	99	49	0	2	150	862	24421	1584	203	26208	27698
		Both Direction	20897	12784	8089	531	134	756	1420	176	128	0	12	316	1736	43505	2968	402	46876	49564
		Composition%	44.58	27.27	17.26	1.13	0.29	1.61	3.03	0.37	0.27	0.00	0.02	0.67	3.70	92.81	6.33	0.86	100.00	
	Morning Peak	Both Direction	1256	1826	741	30	8	49	87	17	13	0	0	29	116	3940	92	36	4068	3725
	0845 - 0945	Composition%	30.88	44.89	18.23	0.73	0.19	1.21	2.14	0.41	0.31	0.00	0.00	0.72	2.86	96.85	2.27	0.88	100.00	
	Evening Peak	Both Direction	1286	1047	584	27	6	39	73	14	9	0	1	24	97	3014	110	25	3150	3129
	1800 - 1900	Composition%	40.83	33.24	18.54	0.87	0.20	1.25	2.31	0.43	0.30	0.00	0.04	0.77	3.09	95.70	3.50	0.79	100.00	
2	MB -02 Alwar Jaipur Road																		
	24 Hrs.	From Alwar	1498	10445	2131	0	16	14	30	9	3	0	7	19	50	14124	852	151	15126	11517
	Volume Count	Towards Alwar	1551	10072	1870	0	15	22	37	10	2	2	8	22	59	13551	745	189	14485	11103
		Both Direction	3049	20517	4000	0	31	36	67	19	5	2	15	41	108	27675	1596	340	29611	22620
		Composition%	10.30	69.29	13.51	0.00	0.10	0.12	0.23	0.06	0.02	0.01	0.05	0.14	0.37	93.46	5.39	1.15	100.00	
	Morning Peak	Both Direction	239	1595	334	0	1	1	2	1	0	0	0	2	4	2172	99	26	2298	1744
	1030 - 1130	Composition%	10.42	69.40	14.55	0.00	0.06	0.04	0.10	0.06	0.01	0.00	0.00	0.07	0.17	94.55	4.32	1.13	100.00	
	Evening Peak	Both Direction	194	2119	302	0	2	4	6	2	0	0	0	2	8	2623	94	21	2738	1917
	1800 - 1900	Composition%	7.10	77.39	11.02	0.00	0.07	0.13	0.21	0.06	0.01	0.00	0.01	0.09	0.29	95.80	3.43	0.77	100.00	
3	MB -03 NH-248 Near Hotal Taj Amer																		
	24 Hrs.	From Jaipur	5353	6070	326	282	65	178	526	180	48	0	44	272	798	12548	1362	49	13959	13398
	Volume Count	Towards Jaipur	5175	6180	313	246	59	231	536	138	40	0	43	222	758	12426	1405	44	13875	13459
		Both Direction	10528	12250	639	529	124	410	1062	318	89	0	88	494	1557	24974	2767	92	27834	26856
		Composition%	37.83	44.01	2.30	1.90	0.45	1.47	3.82	1.14	0.32	0.00	0.31	1.78	5.59	89.73	9.94	0.33	100.00	
	Morning Peak	Both Direction	793	942	59	63	6	22	91	18	3	0	10	31	123	1916	143	10	2069	1958
	1100 - 1200	Composition%	38.31	45.53	2.84	3.03	0.31	1.08	4.42	0.85	0.16	0.00	0.50	1.51	5.93	92.61	6.91	0.48	100.00	
	Evening Peak	Both Direction	759	920	52	34	7	24	66	23	7	0	7	36	102	1833	137	19	1989	1810
	1700 - 1800	Composition%	38.17	46.23	2.63	1.73	0.36	1.22	3.31	1.16	0.34	0.00	0.34	1.83	5.13	92.17	6.87	0.96	100.00	
4	MB -04 Delhi Jaipur Expressway																		
	24 Hrs.	From Jaipur	2913	2283	35	0	6	33	40	1	12	0	8	22	62	5293	8972	45	14310	33008
	Volume Count	Towards Jaipur	3122	2584	50	0	15	36	51	5	13	0	2	20	71	5827	7686	24	13537	29811
		Both Direction	6035	4867	84	0	22	69	91	6	26	0	10	42	133	11120	16658	68	27846	62819
		Composition%	21.67	17.48	0.30	0.00	0.08	0.25	0.33	0.02	0.09	0.00	0.04	0.15	0.48	39.93	59.82	0.25	100.00	
	Morning Peak	Both Direction	423	449	9	0	0	6	6	0	1	0	1	3	9	889	875	5	1768	3468
	1030 - 1130	Composition%	23.90	25.37	0.49	0.00	0.00	0.32	0.32	0.02	0.08	0.00	0.08	0.17	0.49	50.25	49.48	0.26	100.00	
	Evening Peak	Both Direction	158	117	1	0	1	2	3	0	0	0	0	1	4	280	951	1	1231	3461
	2200 - 2300	Composition%	12.83	9.53	0.08	0.00	0.05	0.19	0.24	0.03	0.00	0.00	0.03	0.05	0.30	22.74	77.21	0.05	100.00	
5	MB -05 Jaipur Siker Road																		
	24 Hrs.	From Jaipur	15767	13621	275	306	119	400	825	137	0	84	30	252	1077	30740	2865	233	33838	32345
	Volume Count	Towards Jaipur	13719	11481	277	255	126	365	747	92	0	5	32	130	876	26353	2787	211	29351	28128
		Both Direction	29486	25101	552	561	246	765	1572	230	0	90	62	382	1953	57093	5652	444	63189	60473
		Composition%	46.66	39.72	0.87	0.89	0.39	1.21	2.49	0.36	0.00	0.14	0.10	0.60	3.09	90.35	8.94	0.70	100.00	
	Morning Peak	Both Direction	1720	2544	30	33	20	22	74	15	0	3	12	30	104	4399	277	23	4699	3875
	0830 - 0930	Composition%	36.60	54.15	0.64	0.69	0.42	0.47	1.58	0.32	0.00	0.06	0.26	0.64	2.22	93.61	5.90	0.49	100.00	
	Evening Peak	Both Direction	2081	2002	46	15	13	44	72	12	0	1	0	14	85	4214	233	33	4480	3933
	1800 - 1900	Composition%	46.45	44.69	1.03	0.33	0.28	0.98	1.60	0.28	0.00	0.02	0.01	0.31	1.90	94.07	5.19	0.74	100.00	

S. No.			Fast Moving Passenger Vehicles													Total Goods Vehicles	otal Slow	Total	
						Buses									Total Fast Passenger Vehicles			Vehicles	PCU's
						Long Distance Buses				Other Buses									
			Car	TW	Auto/E-Rickshaw	Roadways Bus	RLPS	Pvt Buses	Total Long-Distance Buses	Total Mini Bus	Tempo Traveller	JCTSL	School Bus	Total Other Buses	Total Buses				
6	MB_06 Gokulpura Kalwar Road																		
	24 Hrs.	From Jaipur	13085	11810	2183	8	55	170	234	207	12	40	72	331	564	27643	1502	420	29565	26524
	Volume Count	Towards Jaipur	7804	16824	2168	9	48	132	189	195	14	32	67	308	497	27293	1448	317	29058	23491
		Both Direction	20890	28633	4352	17	103	303	422	402	26	72	139	639	1061	54936	2951	737	58624	50014
		Composition%	35.63	48.84	7.42	0.03	0.18	0.52	0.72	0.69	0.04	0.12	0.24	1.09	1.81	93.71	5.03	1.26	100.00	
	Morning Peak	Both Direction	1534	1715	300	2	7	19	28	34	1	5	5	45	72	3621	184	56	3860	3398
	1100 - 1200	Composition%	39.73	44.43	7.76	0.04	0.18	0.49	0.72	0.87	0.03	0.13	0.13	1.16	1.87	93.79	4.77	1.44	100.00	
	Evening Peak	Both Direction	1426	2533	349	1	8	23	32	15	1	5	5	27	58	4367	95	48	4510	3558
	1800 - 1900	Composition%	31.62	56.18	7.74	0.01	0.18	0.51	0.70	0.34	0.02	0.11	0.12	0.59	1.29	96.83	2.10	1.07	100.00	
7	MB_07 Jaipur Jodhpur Highway																		
	24 Hrs.	From Jaipur	9237	5096	288	304	33	390	726	120	68	37	33	258	985	15605	9948	83	25636	47854
	Volume Count	Towards Jaipur	9535	4658	288	256	72	382	710	67	75	40	25	207	916	15397	8850	62	24309	42781
		Both Direction	18772	9754	575	559	105	772	1436	187	143	77	58	465	1901	31003	18798	145	49945	90635
		Composition%	37.59	19.53	1.15	1.12	0.21	1.55	2.87	0.38	0.29	0.15	0.12	0.93	3.81	62.07	37.64	0.29	100.00	
	Morning Peak	Both Direction	1240	534	34	35	10	29	73	9	7	5	2	23	96	1904	843	13	2760	4527
	1245 - 1345	Composition%	44.91	19.35	1.24	1.26	0.35	1.04	2.65	0.34	0.24	0.19	0.07	0.85	3.50	69.00	30.54	0.46	100.00	
	Evening Peak	Both Direction	1212	417	34	23	5	26	53	4	4	5	1	13	66	1729	1121	6	2855	4872
	1830 - 1930	Composition%	42.44	14.62	1.19	0.80	0.16	0.90	1.86	0.13	0.13	0.16	0.02	0.44	2.30	60.55	39.25	0.20	100.00	
8	MB_08 Diggi Malpura Road																		
	24 Hrs.	From Jaipur	3249	3256	943	70	0	45	115	272	66	145	6	490	605	8053	500	68	8621	8817
	Volume Count	Towards Jaipur	3496	3085	877	85	0	62	146	242	68	134	10	454	601	8059	517	64	8640	9028
		Both Direction	6745	6341	1820	155	0	107	262	514	134	279	16	944	1206	16112	1017	132	17261	17845
		Composition%	39.08	36.74	10.55	0.90	0.00	0.62	1.52	2.98	0.78	1.62	0.09	5.47	6.98	93.35	5.89	0.76	100.00	
	Morning Peak	Both Direction	470	443	113	12	0	5	17	29	8	22	1	60	77	1103	28	3	1134	1088
	0645 - 0745	Composition%	41.49	39.05	10.00	1.03	0.00	0.44	1.47	2.53	0.71	1.97	0.12	5.32	6.79	97.32	2.44	0.24	100.00	
	Evening Peak	Both Direction	443	264	133	9	0	5	15	33	10	13	0	55	70	909	22	7	938	949
	1415 - 1515	Composition%	47.18	28.13	14.14	0.99	0.00	0.57	1.56	3.48	1.03	1.35	0.04	5.90	7.46	96.91	2.38	0.71	100.00	
9	MB_09 Vatika Road																		
	24 Hrs.	From Jaipur	2696	1948	487	0	0	22	22	13	1	17	8	39	61	5192	1230	261	6683	7489
	Volume Count	Towards Jaipur	2797	2119	538	0	0	31	31	13	1	15	12	40	71	5525	1260	248	7034	7877
		Both Direction	5493	4067	1025	0	0	53	53	26	2	32	20	79	132	10717	2491	509	13717	15367
		Composition%	40.04	29.65	7.47	0.00	0.00	0.38	0.38	0.19	0.01	0.23	0.15	0.58	0.96	78.13	18.16	3.71	100.00	
	Morning Peak	Both Direction	356	275	89	0	0	0	0	1	0	0	6	7	8	728	128	39	895	920
	0800 - 0900	Composition%	39.75	30.77	9.95	0.00	0.00	0.04	0.04	0.15	0.00	0.00	0.67	0.82	0.86	81.33	14.31	4.36	100.00	
	Evening Peak	Both Direction	363	270	80	0	0	4	4	1	0	3	0	4	8	721	138	30	889	928
	1900 - 2000	Composition%	40.85	30.35	9.00	0.00	0.00	0.45	0.45	0.11	0.04	0.30	0.00	0.45	0.90	81.10	15.53	3.38	100.00	
10	MB -10 Jaipur Kota Road																		
	24 Hrs.	From Jaipur	5644	8665	169	169	77	131	378	120	0	87	6	213	591	15068	2769	226	18063	20157
	Volume Count	Towards Jaipur	5832	9123	177	166	86	145	396	115	0	84	3	202	598	15730	2728	215	18673	20415
		Both Direction	11476	17788	345	335	163	276	774	235	0	171	9	415	1189	30798	5496	441	36735	40573
		Composition%	31.24	48.42	0.94	0.91	0.44	0.75	2.11	0.64	0.00	0.47	0.03	1.13	3.24	83.84	14.96	1.20	100.00	
	Morning Peak	Both Direction	1026	1842	22	16	7	6	29	13	0	14	1	29	58	2948	208	36	3192	2892
	0900 - 1000	Composition%	32.15	57.71	0.70	0.50	0.22	0.20	0.92	0.42	0.00	0.45	0.03	0.90	1.82	92.38	6.51	1.12	100.00	
	Evening Peak	Both Direction	661	1747	29	25	12	12	49	19	0	11	0	30	79	2516	282	23	2821	2611
	1800 - 1900	Composition%	23.45	61.95	1.02	0.88	0.43	0.41	1.72	0.69	0.00	0.39	0.00	1.08	2.80	89.21	9.99	0.80	100.00	

* Source: RITES Primary Survey 2025

ANNEXURE 2.4

INTENSITY AND DIRECTIONAL DISTRIBUTION OF TRAFFIC AT OUTER CORDON LOCATIONS

Sr. No.	LOCATION		FAST MOVING PASSENGER VEHICLES												GOODS VEHICLES					SLOW MOVING VEHICLES				Grand Total (Nos.)	Grand Total (PCU's)
			Car/Jeep/ Van	Taxi	2-Whlr	Auto	E-Auto	S. Auto	E-Rickshaw	Mini Bus	Intercity Bus	City Bus	School Bus	Total Fast	LCV	Truck	MAV	Tractor	Total Goods	Cycles	Rickshaw	Others	Total Slow		
1	OC-01_Tankarda																								
	24Hrs. Volume Count	KALADERA To CHOMU (JAIPUR)	6646	221	5930	392	14	52	51	8	16	1	0	13331	1310	93	73	55	1531	115	0	6	121	14983	13309
		CHOMU (JAIPUR) To KALADERA	6212	226	6397	355	19	63	128	7	7	0	0	13414	865	100	22	67	1054	60	0	6	66	14534	12288
		Both Direction	12858	447	12327	747	33	115	179	15	23	1	0	26745	2175	193	95	122	2585	175	0	12	187	29517	25597
		Composition%	43.56	1.51	41.76	2.53	0.11	0.39	0.61	0.05	0.08	0.00	0.00	90.61	7.37	0.65	0.32	0.41	8.76	0.59	0.00	0.04	0.63	100.00	
	Morning Peak	Both Direction	852	30	856	56	6	6	8	2	0	0	0	1816	180	15	6	7	201	5	0	1	6	2023	1770
	1245 - 1345	Composition%	42.12	1.48	42.31	2.77	0.30	0.30	0.40	0.10	0.00	0.00	0.00	89.77	8.90	0.74	0.30	0.35	9.94	0.25	0.00	0.05	0.30	100.00	
	Evening Peak	Both Direction	985	47	1318	54	0	16	12	0	1	0	0	2433	111	15	6	6	132	15	0	1	16	2581	2054
	1730 - 1830	Composition%	38.16	1.82	51.07	2.09	0.00	0.62	0.46	0.00	0.04	0.00	0.00	94.27	4.30	0.58	0.23	0.23	5.11	0.58	0.00	0.04	0.62	100.00	
2	OC-02_Chomu																								
	24Hrs. Volume Count	JAITPURA (JAIPUR) To GOVINDGARH	14882	374	10405	928	63	197	145	206	986	20	93	28299	4402	4495	3660	189	12746	23	3	5	31	41076	62843
		GOVINDGARH To JAITPURA (JAIPUR)	12073	176	9815	816	89	82	56	89	736	28	47	24007	3182	3022	2772	79	9055	10	0	1	11	33073	47444
		Both Direction	26955	550	20220	1744	152	279	201	295	1722	48	140	52306	7584	7517	6432	268	21801	33	3	6	42	74149	110287
		Composition%	36.35	0.74	27.27	2.35	0.20	0.38	0.27	0.40	2.32	0.06	0.19	70.54	10.23	10.14	8.67	0.36	29.40	0.04	0.00	0.01	0.06	100.00	
	Morning Peak	Both Direction	2041	76	2052	111	6	21	20	29	87	1	5	4449	591	516	526	42	1633	2	0	1	3	6085	8619.5
	0915 - 1015	Composition%	33.54	1.25	33.72	1.82	0.10	0.35	0.33	0.48	1.43	0.02	0.08	73.11	9.71	8.48	8.64	0.69	26.84	0.03	0.00	0.02	0.05	100.00	
	Evening Peak	Both Direction	1561	7	1388	90	20	29	10	19	92	0	0	3216	300	533	349	2	1182	1	0	1	2	4400	6349
	1845 - 1945	Composition%	35.48	0.16	31.55	2.05	0.45	0.66	0.23	0.43	2.09	0.00	0.00	73.09	6.82	12.11	7.93	0.05	26.86	0.02	0.00	0.02	0.05	100.00	
3	OC-03_Nawalpura																								
	24Hrs. Volume Count	JAIPUR To SHIVPURI	10518	395	1933	33	0	3	10	55	487	0	2	13436	2473	2378	2734	87	7672	4	0	6	10	21118	37042
		SHIVPURI To JAIPUR	3298	142	1301	8	1	2	9	34	598	1	3	5397	499	227	118	22	866	1	0	0	1	6264	8028
		Both Direction	13816	537	3234	41	1	5	19	89	1085	1	5	18833	2972	2605	2852	109	8538	5	0	6	11	27382	45070
		Composition%	50.46	1.96	11.81	0.15	0.00	0.02	0.07	0.33	3.96	0.00	0.02	68.78	10.85	9.51	10.42	0.40	31.18	0.02	0.00	0.02	0.04	100.00	
	Morning Peak	Both Direction	949	39	284	1	0	0	2	8	69	0	0	1352	202	131	183	9	516	0	0	0	0	1868	2912
	1245 - 1345	Composition%	50.80	2.09	15.20	0.05	0.00	0.00	0.11	0.43	3.69	0.00	0.00	72.38	10.81	7.01	9.80	0.48	27.62	0.00	0.00	0.00	0.00	100.00	
	Evening Peak	Both Direction	1027	39	380	5	0	1	1	6	37	0	0	1496	210	114	191	17	515	0	0	0	0	2011	2976
	1700 - 1800	Composition%	51.07	1.94	18.90	0.25	0.00	0.05	0.05	0.30	1.84	0.00	0.00	74.39	10.44	5.67	9.50	0.85	25.61	0.00	0.00	0.00	0.00	100.00	
4	OC-04_Achrol																								
	24Hrs. Volume Count	JAIPUR To ALWAR	767	13	1229	1	0	0	2	6	15	2	1	2036	241	4	5	19	269	16	0	1	17	2322	1955
		ALWAR To JAIPUR	800	32	1461	21	0	0	6	9	27	3	1	2360	191	24	0	21	236	4	0	0	4	2600	2151
		Both Direction	1567	45	2690	22	0	0	8	15	42	5	2	4396	432	28	5	40	505	20	0	1	21	4922	4106
		Composition%	31.84	0.91	54.65	0.45	0.00	0.00	0.16	0.30	0.85	0.10	0.04	89.31	8.78	0.57	0.10	0.81	10.26	0.41	0.00	0.02	0.43	100.00	
	Morning Peak	Both Direction	118	5	220	2	0	0	1	2	6	0	0	354	36	0	1	9	37	0	0	0	0	391	356
	1000 - 1100	Composition%	30.18	1.28	56.27	0.51	0.00	0.00	0.26	0.51	1.53	0.00	0.00	90.54	9.21	0.00	0.26	2.30	9.46	0.00	0.00	0.00	0.00	100.00	
	Evening Peak	Both Direction	123	4	289	2	0	0	1	0	4	1	1	425	25	2	0	2	27	1	0	1	2	454	350
	1700 - 1800	Composition%	27.09	0.88	63.66	0.44	0.00	0.00	0.22	0.00	0.88	0.22	0.22	93.61	5.51	0.44	0.00	0.44	5.95	0.22	0.00	0.22	0.44	100.00	
5	OC-05_Nayabans																								
	24Hrs. Volume Count	JAIPUR To ALWAR	804	6	1759	16	0	0	7	2	41	44	0	2679	196	38	9	19	262	7	0	3	10	2951	2522
		ALWAR To JAIPUR	912	18	1769	12	0	0	10	4	60	22	4	2811	181	35	12	28	256	14	0	1	15	3082	2669
		Both Direction	1716	24	3528	28	0	0	17	6	101	66	4	5490	377	73	21	47	518	21	0	4	25	6033	5190
		Composition%	28.44	0.40	58.48	0.46	0.00	0.00	0.28	0.10	1.67	1.09	0.07	91.00	6.25	1.21	0.35	0.78	8.59	0.35	0.00	0.07	0.41	100.00	
	Morning Peak	Both Direction	128	1	375	1	0	0	1	1	12	5	0	524	30	2	2	3	34	0	0	0	0	558	445
	0830 - 0930	Composition%	22.94	0.18	67.20	0.18	0.00	0.00	0.18	0.18	2.15	0.90	0.00	93.91	5.38	0.36	0.36	0.54	6.09	0.00	0.00	0.00	0.00	100.00	
	Evening Peak	Both Direction	142	3	353	5	0	0	2	1	8	2	0	516	22	5	2	6	29	2	0	0	2	547	445
	1700 - 1800	Composition%	25.96	0.55	64.53	0.91	0.00	0.00	0.37	0.18	1.46	0.37	0.00	94.33	4.02	0.91	0.37	1.10	5.30	0.37	0.00	0.00	0.37	100.00	
6	OC-06_Chain Pura																								
	24Hrs. Volume	JAIPUR To AJMER	11952	528	10273	355	22	1	225	301	1107	10	26	24800	2132	697	2256	160	5245	125	16	3	144	30189	38361

Sr. No.	LOCATION		FAST MOVING PASSENGER VEHICLES												GOODS VEHICLES					SLOW MOVING VEHICLES				Grand Total (Nos.)	Grand Total (PCU's)
			Car/Jeep/ Van	Taxi	2-Whlr	Auto	E-Auto	S. Auto	E-Rickshaw	Mini Bus	Intercity Bus	City Bus	School Bus	Total Fast	LCV	Truck	MAV	Tractor	Total Goods	Cycles	Rickshaw	Others	Total Slow		
	Count	AJMER To JAIPUR	12136	911	13375	599	111	18	416	70	865	2	18	28521	2192	722	662	27	3603	14	3	0	17	32141	32205
		Both Direction	24088	1439	23648	954	133	19	641	371	1972	12	44	53321	4324	1419	2918	187	8848	139	19	3	161	62330	70566
		Composition%	38.65	2.31	37.94	1.53	0.21	0.03	1.03	0.60	3.16	0.02	0.07	85.55	6.94	2.28	4.68	0.30	14.20	0.22	0.03	0.00	0.26	100.00	
	Morning Peak 0830 - 0930	Both Direction	1513	128	3096	61	33	0	38	29	130	1	8	5037	249	98	104	16	451	7	1	0	8	5496	4994
		Composition%	27.53	2.33	56.33	1.11	0.60	0.00	0.69	0.53	2.37	0.02	0.15	91.65	4.53	1.78	1.89	0.29	8.21	0.13	0.02	0.00	0.15	100.00	
	Evening Peak 1530 - 1630	Both Direction	1586	157	1775	71	0	0	63	15	127	0	3	3797	216	59	104	26	379	4	2	0	6	4182	4268
		Composition%	37.92	3.75	42.44	1.70	0.00	0.00	1.51	0.36	3.04	0.00	0.07	90.79	5.16	1.41	2.49	0.62	9.06	0.10	0.05	0.00	0.14	100.00	
7	OC-07_Dhindhol																								
	24Hrs. Volume Count	JAIPUR To DIDWANA	3898	74	8655	67	5	7	449	27	70	30	10	13292	771	68	142	43	1024	47	0	1	48	14364	11419
		DIDWANA To JAIPUR	3090	83	9077	57	0	1	358	18	86	5	3	12778	456	55	102	65	678	19	1	1	21	13477	10053
		Both Direction	6988	157	17732	124	5	8	807	45	156	35	13	26070	1227	123	244	108	1702	66	1	2	69	27841	21472
		Composition%	25.10	0.56	63.69	0.45	0.02	0.03	2.90	0.16	0.56	0.13	0.05	93.64	4.41	0.44	0.88	0.39	6.11	0.24	0.00	0.01	0.25	100.00	
	Morning Peak 0930 - 1030	Both Direction	513	13	1552	8	0	2	80	3	14	2	1	2188	97	5	6	9	108	13	0	0	13	2309	1682
		Composition%	22.22	0.56	67.22	0.35	0.00	0.09	3.46	0.13	0.61	0.09	0.04	94.76	4.20	0.22	0.26	0.39	4.68	0.56	0.00	0.00	0.56	100.00	
	Evening Peak 1530 - 1630	Both Direction	520	15	1410	7	0	0	88	2	5	3	1	2051	72	7	15	11	94	6	0	0	6	2151	1614
		Composition%	24.17	0.70	65.55	0.33	0.00	0.00	4.09	0.09	0.23	0.14	0.05	95.35	3.35	0.33	0.70	0.51	4.37	0.28	0.00	0.00	0.28	100.00	
8	OC-08_Kathawal																								
	24Hrs. Volume Count	CHAKSHU To JAIPUR	1781	151	1908	122	6	15	15	14	5	0	9	4026	331	77	67	16	491	25	13	0	38	4555	4240
		JAIPUR To CHAKSHU	880	61	1933	147	3	18	22	4	3	0	8	3079	278	15	16	26	335	35	1	0	36	3450	2807
		Both Direction	2661	212	3841	269	9	33	37	18	8	0	17	7105	609	92	83	42	826	60	14	0	74	8005	7047
		Composition%	33.24	2.65	47.98	3.36	0.11	0.41	0.46	0.22	0.10	0.00	0.21	88.76	7.61	1.15	1.04	0.52	10.32	0.75	0.17	0.00	0.92	100.00	
	Morning Peak 1130 - 1230	Both Direction	219	18	228	20	0	0	0	2	1	0	0	488	43	7	8	3	58	1	2	0	3	549	516
		Composition%	39.89	3.28	41.53	3.64	0.00	0.00	0.00	0.36	0.18	0.00	0.00	88.89	7.83	1.28	1.46	0.55	10.56	0.18	0.36	0.00	0.55	100.00	
	Evening Peak 1800 - 1900	Both Direction	213	20	450	25	0	2	1	2	2	0	0	715	47	4	8	2	59	6	0	0	6	780	625.5
		Composition%	27.31	2.56	57.69	3.21	0.00	0.26	0.13	0.26	0.26	0.00	0.00	91.67	6.03	0.51	1.03	0.26	7.56	0.77	0.00	0.00	0.77	100.00	
9	OC-09_Harsooliya																								
	24Hrs. Volume Count	JAIPUR To DUDU	1910	7	3090	28	11	10	2	6	97	2	4	5167	311	158	193	71	733	4	6	0	10	5910	5971
		DUDU To JAIPUR	1838	10	2864	18	1	4	11	10	75	35	1	4867	371	171	160	92	794	8	0	6	14	5675	5897
		Both Direction	3748	17	5954	46	12	14	13	16	172	37	5	10034	682	329	353	163	1527	12	6	6	24	11585	11867
		Composition%	32.35	0.15	51.39	0.40	0.10	0.12	0.11	0.14	1.48	0.32	0.04	86.61	5.89	2.84	3.05	1.41	13.18	0.10	0.05	0.05	0.21	100.00	
	Morning Peak 1215 - 1315	Both Direction	298	6	515	3	2	1	2	0	11	3	0	841	49	8	16	14	73	2	0	0	2	916	845
		Composition%	32.53	0.66	56.22	0.33	0.22	0.11	0.22	0.00	1.20	0.33	0.00	91.81	5.35	0.87	1.75	1.53	7.97	0.22	0.00	0.00	0.22	100.00	
	Evening Peak 1500 - 1600	Both Direction	346	3	573	2	0	0	1	1	14	2	0	942	56	16	23	21	95	0	0	0	0	1037	1018
		Composition%	33.37	0.29	55.26	0.19	0.00	0.00	0.10	0.10	1.35	0.19	0.00	90.84	5.40	1.54	2.22	2.03	9.16	0.00	0.00	0.00	0.00	100.00	
10	OC-10_Mokhampura																								
	24Hrs. Volume Count	JAIPUR To DUDU	9712	436	5214	51	1	6	14	73	773	20	26	16326	2283	3274	5108	234	10899	5	0	7	12	27237	52713
		DUDU To JAIPUR	10044	401	5402	76	10	28	29	188	619	28	15	16840	2239	3442	5594	258	11533	11	3	8	22	28395	55622
		Both Direction	19756	837	10616	127	11	34	43	261	1392	48	41	33166	4522	6716	10702	492	22432	16	3	15	34	55632	108335
		Composition%	35.51	1.50	19.08	0.23	0.02	0.06	0.08	0.47	2.50	0.09	0.07	59.62	8.13	12.07	19.24	0.88	40.32	0.03	0.01	0.03	0.06	100.00	
	Morning Peak 1000 - 1100	Both Direction	1257	83	777	5	0	5	3	9	61	0	5	2205	289	273	403	49	965	3	0	1	4	3174	5246
		Composition%	39.60	2.61	24.48	0.16	0.00	0.16	0.09	0.28	1.92	0.00	0.16	69.47	9.11	8.60	12.70	1.54	30.40	0.09	0.00	0.03	0.13	100.00	
	Evening Peak 1715 - 1815	Both Direction	1359	97	1142	17	0	3	2	13	59	1	1	2694	268	312	631	29	1211	1	0	1	2	3907	6564.5
		Composition%	34.78	2.48	29.23	0.44	0.00	0.08	0.05	0.33	1.51	0.03	0.03	68.95	6.86	7.99	16.15	0.74	31.00	0.03	0.00	0.03	0.05	100.00	
11	OC-11_Bassi Naga																								
	24Hrs. Volume Count	KALWAR To JOBNER	3609	52	3861	27	0	2	12	11	123	24	19	7740	487	201	94	114	896	2	0	3	5	8641	8431
		JOBNER To KALWAR	3775	49	3931	29	0	6	10	12	47	112	14	7985	465	177	55	111	808	1	0	5	6	8799	8370
		Both Direction	7384	101	7792	56	0	8	22	23	170	136	33	15725	952	378	149	225	1704	3	0	8	11	17440	16801
		Composition%	42.34	0.58	44.68	0.32	0.00	0.05	0.13	0.13	0.97	0.78	0.19	90.17	5.46	2.17	0.85	1.29	9.77	0.02	0.00	0.05	0.06	100.00	
	Morning Peak 0830 - 0930	Both Direction	491	9	865	2	0	0	3	4	15	15	6	1410	52	15	9	11	76	0	0	1	1	1487	1269
		Composition%	33.02	0.61	58.17	0.13	0.00	0.00	0.20	0.27	1.01	1.01	0.40	94.82	3.50	1.01	0.61	0.74	5.11	0.00	0.00	0.07	0.07	100.00	
	Evening Peak 1730 - 1830	Both Direction	639	10	879	3	0	0	2	1	29	4	0	1567	62	19	6	22	87	2	0	0	2	1656	1471
		Composition%	38.59	0.60	53.08	0.18	0.00	0.00	0.12	0.06	1.75	0.24	0.00	94.63	3.74	1.15	0.36	1.33	5.25	0.12	0.00	0.00	0.12	100.00	

ANNEXURE 2.5

MODE WISE DISTRIBUTION FOR PARKING DURATION

S. No.	Name of Location	Mode	Duration (Hours)				Total
			0-2 (Hrs)	2-4 (Hrs)	4-8 (Hrs)	>8 (Hrs)	
1	TONK ROAD	Car	697	98	82	29	906
		%	76.93	10.82	9.05	3.2	100
		2-Whlr.	337	64	32	3	436
		%	77.29	14.68	7.34	0.69	100
		Auto	101	16	2	0	119
		%	84.87	13.45	1.68	0	100
2	HOSPITAL ROAD	Car	772	32	21	5	830
		%	93.01	3.86	2.53	0.6	100
		2-Whlr.	708	72	47	8	835
		%	84.79	8.62	5.63	0.96	100
		Auto	248	12	6	0	266
		%	93.23	4.51	2.26	0	100
3	JOHARI BAZAR ROAD	Car	856	45	26	2	929
		%	92.14	4.84	2.8	0.22	100
		2-Whlr.	1308	111	94	16	1529
		%	85.55	7.26	6.15	1.05	100
		Auto	447	16	0	0	463
		%	96.54	3.46	0	0	100
4	MOTI DONGRI ROAD	Car	987	78	34	8	1107
		%	89.16	7.05	3.07	0.72	100
		2-Whlr.	1504	125	163	38	1830
		%	82.19	6.83	8.91	2.08	100
		Auto	598	16	0	0	614
		%	97.39	2.61	0	0	100
5	AGRA ROAD	Car	639	12	11	3	665
		%	96.09	1.8	1.65	0.45	100
		2-Whlr.	1124	109	86	14	1333
		%	84.32	8.18	6.45	1.05	100
		Auto	234	6	2	0	242
		%	96.69	2.48	0.83	0	100

S. No.	Name of Location	Mode	Duration (Hours)				Total
			0-2 (Hrs)	2-4 (Hrs)	4-8 (Hrs)	>8 (Hrs)	
6	ACP TOUR TO JAIPUR JUNCTION	Car/Taxi	167	22	1	2	192
		%	86.98	11.46	0.52	1.04	100
		TW	168	19	1	0	188
		%	89.36	10.11	0.53	0	100
		Auto	140	10	3	0	153
		%	91.5	6.54	1.96	0	100
7	ACP TOUR TO POLICE STATION	Car/Taxi	181	18	2	0	201
		%	90.05	8.96	1	0	100
		TW	126	12	4	0	142
		%	88.73	8.45	2.82	0	100
		Auto	82	9	0	0	91
		%	90.11	9.89	0	0	100
8	HOTEL DIAMOND TO CHANDPOLE	Car/Taxi	123	20	4	0	147
		%	83.67	13.61	2.72	0	100
		TW	123	10	7	2	142
		%	86.62	7.04	4.93	1.41	100
		Auto	72	0	0	0	72
		%	100	0	0	0	100
9	MIRZA ISMAIL ROAD	Car/Taxi	201	5	0	0	206
		%	97.57	2.43	0	0	100
		TW	97	0	0	0	97
		%	100	0	0	0	100
		Auto	69	0	0	0	69
		%	100	0	0	0	100
10	MOTILAL ATAL ROAD	Car/Taxi	191	0	0	0	191
		%	100	0	0	0	100
		TW	172	0	0	0	172
		%	100	0	0	0	100
		Auto	81	5	1	0	87
		%	93.1	5.75	1.15	0	100
11	PARIVAHAN ROAD	Car/Taxi	294	0	0	0	294
		%	100	0	0	0	100

S. No.	Name of Location	Mode	Duration (Hours)				Total
			0-2 (Hrs)	2-4 (Hrs)	4-8 (Hrs)	>8 (Hrs)	
		TW	303	0	0	0	303
		%	100	0	0	0	100
		Auto	172	1	0	0	173
		%	99.42	0.58	0	0	100
12	VANSTHALI ROAD	Car/Taxi	237	0	0	0	237
		%	100	0	0	0	100
		TW	211	0	0	0	211
		%	100	0	0	0	100
		Auto	21	0	0	0	21
		%	100	0	0	0	100
13	TRANSPORT NAGAR LEFT SIDE	Car/Taxi	212	0	0	0	212
		%	100	0	0	0	100
		TW	36	0	0	0	36
		%	100	0	0	0	100
		Auto	92	0	0	0	92
		%	100	0	0	0	100
14	TRANSPORT NAGAR RIGHT SIDE	Car/Taxi	164	0	0	0	164
		%	100	0	0	0	100
		TW	122	0	0	0	122
		%	100	0	0	0	100
		Auto	88	0	0	0	88
		%	100	0	0	0	100
15	NEAR KALPANA TRAVELS	Car/Taxi	38	9	27	2	76
		%	50	11.84	35.52	2.63	100
		TW	18	8	24	0	50
		%	36	16	48	0	100
16	NEAR ROYAL TRADING COMPANY	Car/Taxi	1	0	0	1	2
		%	50	0	0	50	100
		TW	11	22	23	1	57
		%	19.3	38.6	40.35	1.75	100
17	High Court (Bhagwan Das Road)	Car	1844	3	1847	0	1847

S. No.	Name of Location	Mode	Duration (Hours)				Total
			0-2 (Hrs)	2-4 (Hrs)	4-8 (Hrs)	>8 (Hrs)	
		%	0.998376	0.001624	1	0	1
		2-Whlr.	404	2	406	0	406
		%	0.995074	0.004926	1	0	1
		Auto	34	0	34	0	34
		%	1	0	1	0	1
18	Gandhi Nagar Railway Station Parking	Car	5	0	5	0	5
		%	1	0	1	0	1
		2-Whlr.	534	1	535	0	535
		%	0.998131	0.001869	1	0	1
		Auto	1	0	1	0	1
		%	1	0	1	0	1
19	Jaipur Railway Station Parking-Gate No-01	Car	246	0	246	0	246
		%	1	0	1	0	1
		2-Whlr.	519	0	519	0	519
		%	0.970093	0	0.970093	0	0.970093
		Auto	0	0	0	0	0
		%	0	0	0	0	0
20	Jaipur Railway Station Parking-Gate No-02	Car	283	0	283	0	283
		%	1.150407	0	1.150407	0	1.150407
		2-Whlr.	1556	0	1556	0	1556
		%	1	0	1	0	1
		Auto	0	0	0	0	0
		%	0	0	0	0	0
21	City Palace Parking	Car	247	0	247	0	247
		%	1	0	1	0	1
		2-Whlr.	554	6	560	0	560
		%	0.356041	0.003856	0.359897	0	0.359897
		Auto	0	0	0	0	0
		%	0	0	0	0	0
22	Chandpole Metro Station Parking	Car	28	0	28	0	28
		%	0.11336	0	0.11336	0	0.11336

S. No.	Name of Location	Mode	Duration (Hours)				Total
			0-2 (Hrs)	2-4 (Hrs)	4-8 (Hrs)	>8 (Hrs)	
		2-Whlr.	204	0	204	0	204
		%	0.131105	0	0.131105	0	0.131105
		Auto	8	0	8	0	8
		%	8	0	8	0	8
23	Barkat Nagar Market	Car	439	5	444	0	444
		%	0.988739	0.011261	1	0	1
		2-Whlr.	7305	31	7336	0	7336
		%	0.995774	0.004226	1	0	1
		Auto	8	0	8	0	8
		%	1	0	1	0	1
24	Bapu Bazaar Road	Car	1762	12	1774	0	1774
		%	0.993236	0.006764	1	0	1
		2-Whlr.	7281	160	7441	0	7441
		%	0.978498	0.021502	1	0	1
		Auto	70	0	70	0	70
		%	1	0	1	0	1
25	Chandpole Bazaar Road	Car	2374	19	2393	0	2393
		%	0.99206	0.00794	1	0	1
		2-Whlr.	8534	223	8757	0	8757
		%	0.974535	0.025465	1	0	1
		Auto	124	0	124	0	124
		%	1	0	1	0	1
26	Tripolia Bazaar Road	Car	2269	18	2287	0	2287
		%	0.992129	0.007871	1	0	1
		2-Whlr.	8408	221	8629	0	8629
		%	0.974389	0.025611	1	0	1
		Auto	75	1	76	0	76
		%	0.986842	0.013158	1	0	1
27	JDA Vaishali Marg Parking	Car	16	0	16	0	16
		%	1	0	1	0	1
		2-Whlr.	7	0	7	0	7
		%	1	0	1	0	1
		Auto	1	0	1	0	1
		%	1	0	1	0	1

* Source: RITES Primary Survey 2025

ANNEXURE 3.1

POPULATION DISTRIBUTION IN STUDY AREA

TAZ	2024	2031	2041	2051	2055
1	41380	51274	64196	73928	78222
2	65619	81309	101799	117232	124041
3	80562	99824	124980	143927	152286
4	41280	51151	64041	73749	78033
5	38360	47532	59511	68532	72513
6	45921	56900	71240	82039	86805
7	54038	66958	83832	96540	102148
8	49337	61133	76539	88143	93262
9	61859	76650	95966	110514	116934
10	58508	72497	90767	104527	110599
11	59648	73910	92536	106564	112754
12	38654	44523	55743	64194	67923
13	60718	75235	94195	108475	114775
14	49741	61633	77165	88864	94025
15	46260	57320	71766	82645	87446
16	50246	62260	77950	89767	94981
17	50546	66964	83839	96549	102157
18	44629	55299	69235	79731	84362
19	66268	87793	109917	126580	133932
20	53417	66189	82869	95432	100975
21	51980	64409	80640	92865	98259
22	51821	59689	74732	86061	91059
23	42054	48440	60647	69841	73897
24	48685	60326	75528	86978	92030
25	48592	52097	65226	75114	79477
26	59956	64281	80480	92681	98064
27	42188	45231	56629	65214	69002
28	34956	40264	50411	58053	61425
29	51956	55704	69742	80314	84979
30	49585	53161	66558	76648	81101
31	46010	52997	66352	76411	80850
32	51430	63727	79787	91883	97220
33	45673	60508	75756	87241	92308
34	45992	56989	71350	82167	86939
35	59628	68682	85991	99027	104779
36	58621	67522	84538	97354	103008
37	72214	89480	112029	129013	136506

TAZ	2024	2031	2041	2051	2055
38	50488	62560	78326	90200	95439
39	56706	70264	87971	101308	107192
40	42087	52149	65291	75189	79557
41	44773	55479	69460	79990	84636
42	22989	28485	35664	41070	43456
43	42580	49046	61406	70714	74822
44	57119	70776	88612	102045	107972
45	59209	73365	91854	105779	111923
46	64612	80060	100236	115431	122136
47	38307	47466	59427	68436	72411
48	43074	53372	66823	76953	81423
49	45101	51949	65041	74901	79251
50	52848	65483	81986	94414	99898
51	47856	59298	74242	85497	90463
52	48816	56229	70399	81071	85780
53	37825	43568	54548	62817	66466
54	69421	86020	107697	124024	131228
55	49771	61672	77213	88919	94083
56	48988	56427	70647	81357	86082
57	47722	54968	68820	79254	83857
58	50309	62338	78048	89880	95100
59	63592	78797	98655	113611	120210
60	41157	50998	63849	73529	77800
61	46754	57932	72532	83527	88379
62	41487	51406	64361	74118	78423
63	44843	55565	69568	80114	84768
64	43671	50302	62979	72527	76739
65	37540	40248	50390	58030	61400
66	13988	14997	18776	21623	22879
67	41754	44766	56048	64544	68293
68	49361	61163	76576	88185	93307
69	34759	37267	46658	53732	56853
70	36929	42536	53256	61329	64892
71	35111	37644	47131	54276	57428
72	30818	33041	41367	47639	50406
73	31631	33912	42458	48895	51735
74	30754	32973	41282	47541	50302
75	30444	35067	43904	50560	53497
76	39768	42637	53381	61474	65044
77	30990	35696	44692	51467	54457
78	31434	33701	42194	48591	51413

TAZ	2024	2031	2041	2051	2055
79	41461	44452	55654	64091	67814
80	44842	51651	64667	74470	78796
81	52709	60713	76013	87536	92621
82	56947	65594	82125	94575	100068
83	35734	41160	51533	59346	62793
84	26473	28383	35536	40923	43300
85	32552	34900	43695	50319	53242
86	30122	37324	46730	53814	56940
87	35146	40482	50684	58368	61758
88	37110	45983	57571	66298	70149
89	41067	50886	63710	73368	77630
90	40807	47004	58849	67770	71707
91	65441	81088	101522	116913	123704
92	16140	18591	23276	26804	28361
93	21451	24708	30935	35625	37694
94	9664	11132	13937	16050	16982
95	8290	9549	11955	13768	14568
96	16767	19313	24180	27846	29463
97	9694	11166	13980	16100	17035
98	15604	17973	22502	25913	27419
99	11955	13771	17241	19855	21008
100	37506	43201	54088	62288	65906
101	8083	9311	11657	13424	14204
102	8723	10048	12580	14487	15329
103	8647	9960	12470	14360	15194
104	6868	7911	9904	11406	12068
105	7126	8209	10277	11835	12523
106	10730	12360	15474	17820	18855
107	7625	8782	10995	12662	13398
108	13579	15640	19582	22550	23860
109	6946	8001	10017	11536	12206
110	3319	3823	4786	5512	5832
111	5981	6889	8625	9932	10509
112	4972	5726	7169	8256	8736
113	4238	4882	6112	7039	7448
114	6716	7735	9685	11153	11801
115	15806	18206	22794	26249	27774
116	6192	7133	8930	10284	10881
117	8525	9820	12294	14158	14980
118	14438	16630	20821	23978	25370
119	7757	8935	11187	12882	13631

TAZ	2024	2031	2041	2051	2055
120	4051	4666	5842	6727	7118
121	8356	9625	12050	13877	14683
122	10076	11606	14531	16734	17705
123	13552	15609	19543	22506	23813
124	7418	8544	10697	12319	13034
125	10771	13346	16710	19243	20360
126	11413	14141	17705	20389	21573
127	7452	9234	11561	13313	14087
128	14733	18255	22856	26321	27850
129	21674	26856	33624	38721	40970
130	16185	18642	23341	26879	28440
131	10006	11526	14430	16618	17583
132	8801	10137	12692	14616	15465
133	19430	22380	28020	32268	34142
134	16313	18790	23525	27092	28665
135	10300	11864	14853	17105	18098
136	15218	20161	25241	29068	30756
137	11043	12720	15925	18340	19405
138	5167	5951	7451	8581	9079
139	11364	13089	16388	18872	19968
140	6867	7909	9902	11403	12066
141	44999	51831	64893	74731	79072
142	6577	7575	9484	10922	11557
143	12032	13859	17351	19982	21143
144	11656	13426	16809	19357	20482
145	15240	17555	21978	25310	26781
146	6863	7905	9897	11398	12060
147	12544	14448	18089	20832	22042
148	8638	9949	12457	14345	15178
149	7912	10482	13124	15113	15991
150	13640	15711	19670	22652	23967
151	7493	8631	10806	12445	13167
152	12834	14783	18509	21315	22553
153	23761	27368	34265	39460	41752
154	11066	12746	15959	18378	19445
155	9085	10465	13102	15088	15965
156	11074	12755	15970	18391	19459
157	12038	13866	17361	19993	21154
158	19160	22069	27631	31819	33668
159	15587	17954	22478	25886	27390
160	42022	48402	60600	69787	73841

TAZ	2024	2031	2041	2051	2055
161	10761	12396	15519	17872	18910
162	22888	26363	33007	38011	40218
163	20564	23687	29656	34152	36135
164	7873	9069	11354	13075	13835
165	89231	110566	138429	159415	168674
166	13227	16389	20519	23630	25003
167	20921	24098	30171	34745	36763
168	12433	15406	19289	22213	23503
169	14448	16642	20835	23994	25388
170	12445	15421	19307	22234	23526
171	13692	16965	21241	24461	25882
172	17140	19742	24718	28465	30118
173	8049	9272	11608	13368	14144
174	6135	7067	8848	10189	10781
175	5198	5987	7496	8633	9134
176	11036	12712	15916	18328	19393
177	11450	13189	16512	19016	20120
178	19431	22382	28022	32270	34144
179	19550	22518	28193	32467	34352
180	13560	15618	19554	22519	23827
181	8399	9674	12112	13949	14759
182	19879	22898	28668	33014	34932
183	7918	9120	11418	13149	13913
184	5885	6778	8487	9773	10341
185	6547	7541	9441	10872	11504
186	16950	19524	24444	28150	29785
187	13486	15534	19449	22397	23698
188	18928	21802	27296	31434	33260
189	20559	23681	29649	34144	36127
190	33716	41777	52305	60235	63734
Total	**5586180**	**6641159**	**8314777**	**9575283**	**10131463**

EMPLOYMENT DISTRIBUTION IN STUDY AREA

TAZ	2024	2031	2041	2051	2055
1	14483	18459	24394	28832	30507
2	22967	29271	38684	45720	48376
3	28197	35936	47492	56131	59392
4	14448	18414	24336	28762	30433
5	13426	17112	22614	26728	28280
6	16072	20484	27071	31995	33854
7	18913	24105	31856	37651	39838
8	17268	22008	29085	34376	36372
9	21651	27594	36467	43101	45604
10	20478	26099	34492	40766	43134
11	20877	26608	35164	41560	43974
12	13529	16028	21182	25036	26490
13	21251	27085	35794	42305	44762
14	17409	22188	29323	34657	36670
15	16191	20635	27271	32232	34104
16	17586	22413	29621	35009	37043
17	17691	24107	31859	37654	39841
18	15620	19908	26309	31095	32901
19	23194	31605	41768	49366	52233
20	18696	23828	31490	37218	39380
21	18193	23187	30643	36217	38321
22	18137	21488	28398	33564	35513
23	14719	17438	23046	27238	28820
24	17040	21717	28701	33921	35892
25	17007	18755	24786	29294	30996
26	20985	23141	30582	36145	38245
27	14766	16283	21519	25434	26911
28	12235	14495	19156	22641	23956
29	18185	20053	26502	31323	33142
30	17355	19138	25292	29893	31629
31	16104	19079	25214	29800	31532
32	18001	22942	30319	35834	37916
33	15985	21783	28787	34024	36000
34	16097	20516	27113	32045	33906
35	20870	24726	32676	38620	40864
36	20517	24308	32124	37968	40173
37	25275	32213	42571	50315	53237
38	17671	22522	29764	35178	37221
39	19847	25295	33429	39510	41805
40	14730	18774	24811	29324	31027

TAZ	2024	2031	2041	2051	2055
41	15671	19972	26395	31196	33008
42	8046	10255	13552	16017	16948
43	14903	17656	23334	27579	29181
44	19992	25479	33672	39797	42109
45	20723	26411	34904	41254	43650
46	22614	28822	38090	45018	47633
47	13407	17088	22582	26690	28240
48	15076	19214	25393	30012	31755
49	15785	18702	24715	29211	30908
50	18497	23574	31155	36822	38960
51	16750	21347	28212	33344	35281
52	17086	20242	26752	31618	33454
53	13239	15685	20728	24499	25922
54	24297	30967	40925	48369	51179
55	17420	22202	29341	34678	36692
56	17146	20314	26846	31729	33572
57	16703	19789	26152	30909	32704
58	17608	22442	29658	35053	37089
59	22257	28367	37489	44308	46882
60	14405	18359	24263	28676	30342
61	16364	20856	27562	32576	34468
62	14520	18506	24457	28906	30585
63	15695	20003	26436	31245	33060
64	15285	18109	23932	28285	29928
65	13139	14489	19148	22632	23946
66	4896	5399	7135	8433	8923
67	14614	16116	21298	25172	26634
68	17276	22019	29099	34392	36390
69	12166	13416	17730	20955	22173
70	12925	15313	20237	23918	25308
71	12289	13552	17910	21168	22397
72	10786	11895	15720	18579	19658
73	11071	12208	16134	19069	20177
74	10764	11870	15687	18541	19618
75	10656	12624	16684	19718	20864
76	13919	15349	20285	23975	25367
77	10847	12851	16983	20072	21238
78	11002	12132	16034	18950	20051
79	14511	16003	21149	24996	26447
80	15695	18594	24573	29043	30730
81	18448	21857	28885	34139	36122
82	19932	23614	31207	36884	39027

TAZ	2024	2031	2041	2051	2055
83	12507	14818	19583	23145	24489
84	9266	10218	13504	15960	16887
85	11393	12564	16604	19624	20764
86	10543	13437	17757	20988	22207
87	12301	14574	19260	22764	24086
88	12988	16554	21877	25856	27358
89	14373	18319	24210	28614	30276
90	14283	16921	22363	26430	27966
91	22904	29192	38579	45596	48245
92	5649	6693	8845	10454	11061
93	7508	8895	11755	13894	14701
94	3383	4007	5296	6259	6623
95	2902	3438	4543	5369	5682
96	5868	6953	9188	10860	11491
97	3393	4020	5312	6279	6644
98	5461	6470	8551	10106	10693
99	4184	4957	6552	7743	8193
100	13127	15552	20554	24292	25703
101	2829	3352	4430	5236	5540
102	3053	3617	4781	5650	5978
103	3026	3586	4739	5601	5926
104	2404	2848	3764	4448	4707
105	2494	2955	3905	4616	4884
106	3756	4449	5880	6950	7353
107	2669	3162	4178	4938	5225
108	4752	5631	7441	8795	9305
109	2431	2880	3807	4499	4760
110	1162	1376	1819	2150	2274
111	2093	2480	3277	3874	4099
112	1740	2062	2724	3220	3407
113	1483	1758	2323	2745	2905
114	2350	2785	3680	4350	4602
115	5532	6554	8662	10237	10832
116	2167	2568	3393	4011	4244
117	2984	3535	4672	5522	5842
118	5053	5987	7912	9351	9894
119	2715	3217	4251	5024	5316
120	1418	1680	2220	2624	2776
121	2925	3465	4579	5412	5726
122	3527	4178	5522	6526	6905
123	4743	5619	7426	8777	9287
124	2596	3076	4065	4804	5083

TAZ	2024	2031	2041	2051	2055
125	3770	4805	6350	7505	7940
126	3994	5091	6728	7952	8413
127	2608	3324	4393	5192	5494
128	5157	6572	8685	10265	10862
129	7586	9668	12777	15101	15978
130	5665	6711	8869	10483	11092
131	3502	4149	5483	6481	6857
132	3080	3649	4823	5700	6031
133	6800	8057	10648	12585	13315
134	5710	6764	8940	10566	11179
135	3605	4271	5644	6671	7058
136	5326	7258	9592	11336	11995
137	3865	4579	6052	7152	7568
138	1808	2142	2831	3346	3541
139	3977	4712	6227	7360	7788
140	2403	2847	3763	4447	4706
141	15750	18659	24659	29145	30838
142	2302	2727	3604	4260	4507
143	4211	4989	6594	7793	8246
144	4080	4833	6387	7549	7988
145	5334	6320	8352	9871	10445
146	2402	2846	3761	4445	4703
147	4390	5201	6874	8124	8596
148	3023	3582	4734	5595	5919
149	2769	3774	4987	5894	6236
150	4774	5656	7475	8834	9347
151	2623	3107	4106	4853	5135
152	4492	5322	7033	8313	8796
153	8316	9853	13021	15389	16283
154	3873	4589	6064	7167	7584
155	3180	3767	4979	5884	6226
156	3876	4592	6068	7172	7589
157	4213	4992	6597	7797	8250
158	6706	7945	10500	12410	13131
159	5456	6463	8542	10096	10682
160	14708	17425	23028	27217	28798
161	3767	4462	5897	6970	7375
162	8011	9491	12543	14824	15685
163	7197	8527	11269	13319	14093
164	2756	3265	4315	5099	5396
165	31231	39804	52603	62172	65783
166	4629	5900	7797	9216	9751

TAZ	2024	2031	2041	2051	2055
167	7322	8675	11465	13550	14338
168	4352	5546	7330	8663	9166
169	5057	5991	7917	9358	9901
170	4356	5552	7337	8671	9175
171	4792	6108	8072	9540	10094
172	5999	7107	9393	11101	11746
173	2817	3338	4411	5214	5516
174	2147	2544	3362	3974	4205
175	1819	2155	2849	3367	3562
176	3863	4576	6048	7148	7563
177	4008	4748	6275	7416	7847
178	6801	8057	10648	12585	13316
179	6842	8106	10713	12662	13397
180	4746	5623	7431	8782	9293
181	2940	3483	4603	5440	5756
182	6958	8243	10894	12876	13623
183	2771	3283	4339	5128	5426
184	2060	2440	3225	3812	4033
185	2291	2715	3588	4240	4487
186	5933	7029	9289	10978	11616
187	4720	5592	7390	8735	9242
188	6625	7849	10372	12259	12971
189	7196	8525	11267	13316	14090
190	11801	15040	19876	23492	24856
Total	**1955163**	**2390817**	**3159615**	**3734360**	**3951271**

RITES LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
URBAN ENGINEERING & GREEN MOBILITY
SHIKHAR, PLOT NO. 1, SECTOR 29,
GURGAON – 122001 (INDIA)



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