

## EXPLORING URBAN SUSTAINABILITY IN MANESAR TOWN, GURUGRAM: ADDRESSING TRAFFIC, TRANSPORT AND HOUSING CHALLENGES THROUGH SUSTAINABLE URBAN PLANNING

**Nidhi1, Dr. Salahuddin Mohd.2**

1. Research Scholar, School of Earth Science, Banasthali Vidyapith, Rajasthan.
2. Assistant Professor, School of Earth Science, Banasthali Vidyapith, Rajasthan

**Abstract:** Manesar Town, located in Gurugram district of Haryana, has emerged as a rapidly urbanizing industrial hub within the National Capital Region (NCR). The town's strategic location along National Highway-48 and its concentration of industrial and commercial activities have attracted significant population and employment growth. However, this rapid transformation has generated acute challenges related to traffic congestion, inadequate transport infrastructure and housing shortages. Therefore, this study investigates the interplay between population growth, employment concentration and urban infrastructure stress in Manesar. The paper further discusses the environmental and social implications of unplanned expansion and proposes sustainable urban planning strategies, including integrated transport systems, transit-oriented development, affordable housing schemes and mixed-use land policies.

**Keywords:** Manesar; Housing; Traffic; Sustainable; Planning.

### 1. Introduction: -

Since the onset of economic liberalization in 1991, India's economy has experienced swift growth, accompanied by significant spatial transformations, including the accelerated development of major cities, industrial agglomeration, particularly in the automotive sector, enhanced connectivity between urban and rural regions and the establishment of urban networks. Suburban areas, characterized by the blending of urban and rural regions, have seen significant expansion (Mizushima and Yanagizawa, 2015). Accelerated suburban growth in megacity areas has led to considerable alterations in the lives of urban inhabitants as urban environments are restructured. In metropolitan suburban regions like Gurugram, high-rise office structures and residential complexes constitute a contemporary urban environment (Okahashi and Yui, 2018). In Gurugram, Manesar is a rapidly rising industrial town. In recent years, this region has transformed from rural to one of the fastest-growing townships. Consequently, millions of individuals get work in Manesar from nearby and far locations due to its many factories, which serve as a significant source of jobs. Manesar was conceived in the 1980s as an Industrial Model Township (IMT) during the establishment of Maruti Udyog Ltd, under the auspices of the Haryana State Industrial and Infrastructure Development Corporation, a body of the Haryana Government. Land acquisition processes for the construction of IMT Manesar commenced in 1994–1995. The first allocation of industrial plots to Maruti Vendors occurred in 1997, followed by further allocations beginning in 1999. Haryana State Industrial & Infrastructure Development Corporation Ltd. (HSIIDC) has

allocated around 2,100 plots for the establishment of industrial enterprises by entrepreneurs throughout the years (Jha, 2019; Khandelwal, 2012). Numerous large global corporations exist, including Maruti Suzuki, Jaquar, JBM Auto and Toshiba Eco City. Prominent manufacturing entities include Maruti and Honda. The national Data Center of Aadhar is also situated in Manesar. The Indian Institute of Corporate Affairs, under the Ministry of Corporate Affairs, is situated here, beside the Manesar Software Technology Park, which spans 170 acres (69 hectares). In 2023, Manesar had 2,200 industrial manufacturing facilities, employing 300,000 individuals, of whom 200,000 resided in Manesar and the remainder commuted daily from external locations.

Manesar has evolved as a hub for international industrial enterprises and is now an integral component of the millennium city, emerging as a mega-city. The commercial and residential center in Gurgaon, along with the industrial foundation in Manesar, positions the whole district to surpass Noida within the National Capital Region. The industrial region, overseen by the HSIIDC, encompasses 5,000 acres. Manesar is situated at the convergence of NH-8 and the projected Kundli-Palwal-Manesar Expressway, providing excellent connectivity to both Delhi and Gurgaon. According to the integrated development plan, the residential sectors in Manesar have expanded from one to four, enabling personnel to dwell near the industrial units and conveniently go to their offices. Manesar has emerged as a prime location for developers. The Haryana Government has implemented several efforts to enhance the region's economic prosperity. The main ones are: The Kundli-Manesar-Palwal (KMP) Global Corridor has been planned as a major development axis, with several growth-oriented projects proposed along its stretch. In this context, a number of Special Economic Zones (SEZs) have been envisioned in and around the Gurugram-Manesar region, including Reliance Haryana SEZ (RHSEZ), Raheja SEZ, DLF Cyber SEZ, Raheja Engineering SEZ, Uppal SEZ, Emmar MGF SEZ, DLF SEZ and IREO SEZ, among others. These projects are designed to serve as hubs of industrial and commercial activity, significantly contributing to regional development. The proposed DLF Cyber City alone is projected to generate nearly 5 lakh jobs, while the Reliance Haryana SEZ is expected to create around 23 lakh employment opportunities, thereby transforming Manesar into a key center of economic growth and urban expansion (DTPC, 2010).

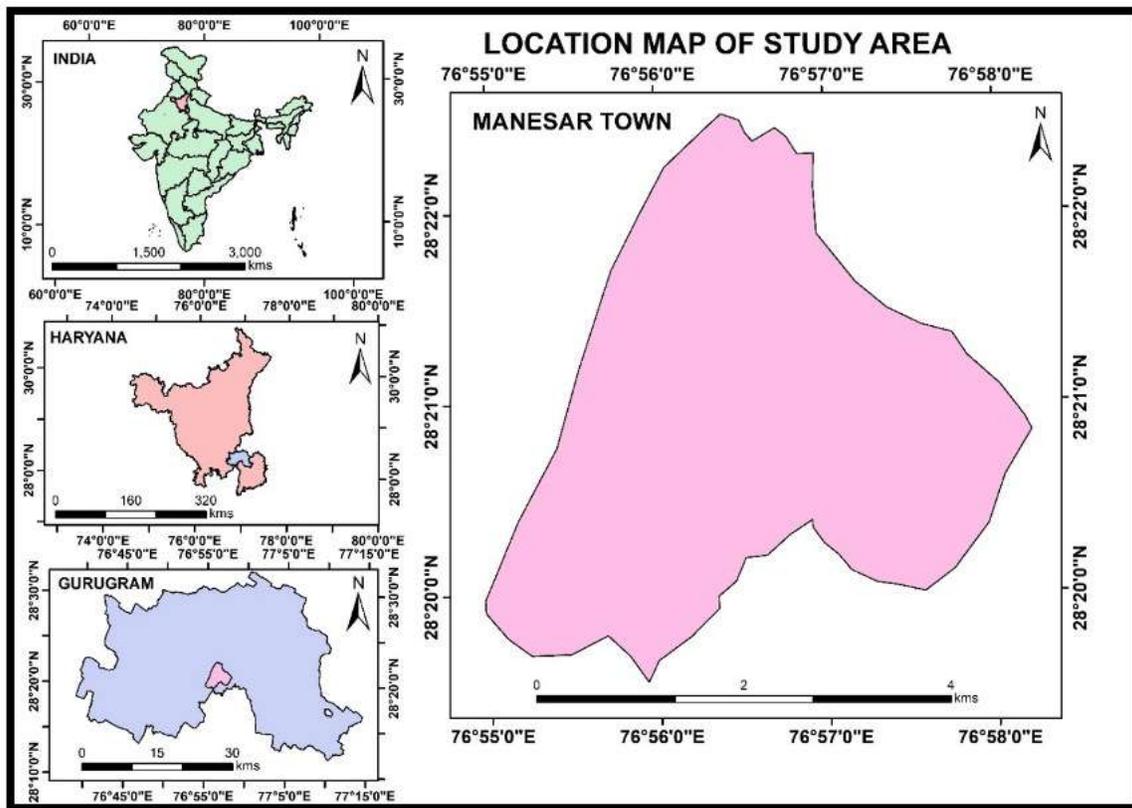
Manesar, once a small village near Gurgaon, has transformed into a vibrant centre of industrial and real estate development, benefiting from India's infrastructural expansion. The rapid advancement of its roadways, train systems and other essential infrastructure has established Manesar as a significant entity in the Delhi-NCR area. It is attracting enterprises, investors and homeowners, hence contributing to its emergence as a crucial component of India's expanding economy. Manesar Town has seen rapid industrial and demographic expansion, resulting in traffic congestion, insufficient public transportation and a scarcity of housing. The excessive reliance on private automobiles has exacerbated air pollution, while the scarcity of affordable housing has intensified informal settlements and escalating land prices. These concerns underscore the pressing need for sustainable urban growth. It is crucial to mitigate emissions and protect green areas for environmental sustainability; enhancing mobility and housing will elevate quality of life socially; and alleviating congestion and ensuring sufficient housing will bolster productivity and workforce

stability economically. Sustainable planning methodologies are essential to reconcile Manesar’s industrial expansion with habitability and enduring resilience. In this view, this paper aims to find out the root cause of traffic congestion and housing problems and further, provides suggestions for improving the current situation in view of sustainable urban planning.

**2. Research Methodology: -**

**2.1. Study Area: Manesar**, located in the Gurgaon district of Haryana, India, is a rapidly developing industrial town and is included in the National Capital Region (NCR) of Delhi. It has evolved from a tranquil village into one of the most rapidly developing townships in India. It includes Industrial Modal Township Manesar (IMT-Manesar), which has been built by the HSIIDC. It is an emerging region of the NCR. Figure 1 shows the study area.

**Fig 1: Map of study area**



**Source: Administrative boundary Census of India, Base Map Manesar Municipal Corporation, 2022.**

According to the 2011 census, Manesar has a population of 23,448 and is an industrial city undergoing fast development. Several developers have created a new designation for Manesar: “New Gurgaon”. The proximity to the political epicentre, Delhi, has prompted the government to build the headquarters of many institutions of national significance, including the National Security Guards (and its training facility), the National Bomb Data Centre and the National Brain Research Centre. Manesar is located 32 kilometers from IGI Airport and has some of the finest metropolitan infrastructure in northern India. The region, situated on NH 8, is well-connected to

Delhi, Rewari, Dharuhera, Jaipur, Ahmedabad and Mumbai, with similarly robust air access (Sharma and Sen, 2015; Devi and Saha, 2024; Dev et al., 2022).

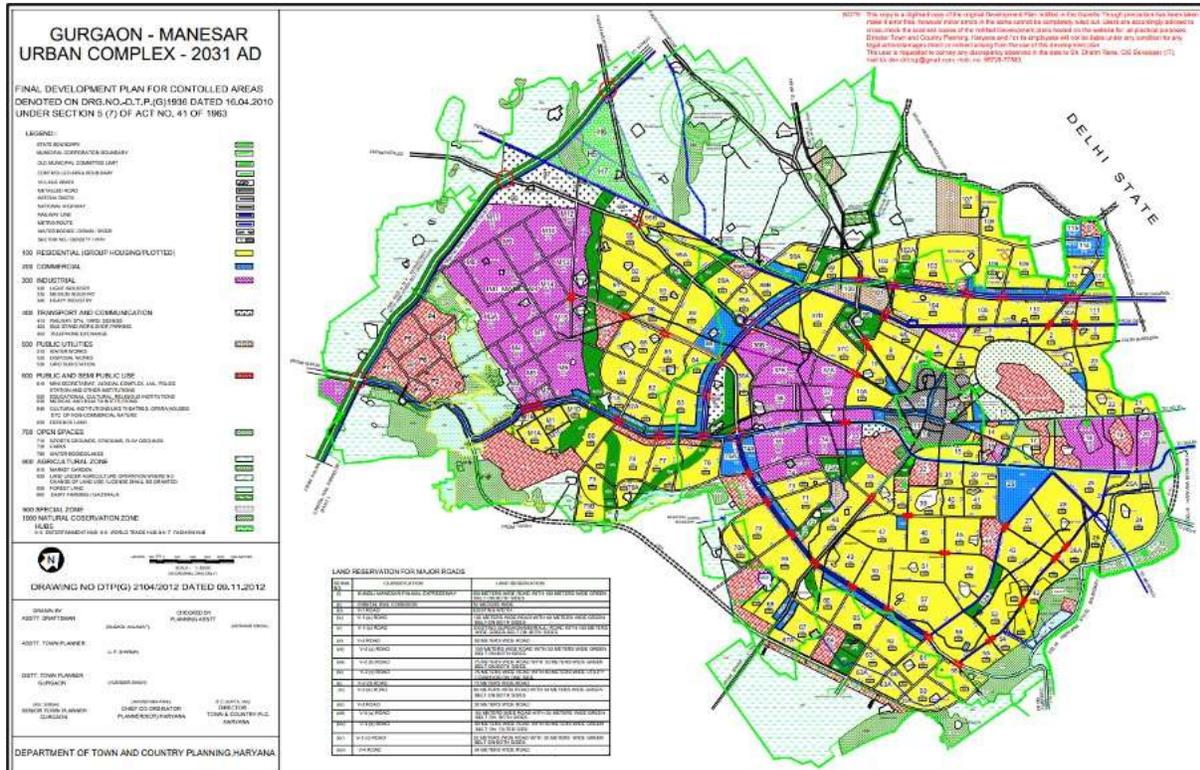
**2.2. Data Collection:** The present study is based mainly on secondary data sources to examine issues of traffic congestion, transport infrastructure and housing shortages in Manesar Town, Gurugram. Relevant data were collected from a wide range of reliable sources, including government reports and official statistics (such as Census of India, Haryana Urban Development Authority, HSIIDC and Town and Country Planning Department), research articles and academic publications focusing on urban growth and sustainability, as well as policy documents. Supplementary information was also gathered from reputed newspapers, online archives and government websites, which provided updated insights into ongoing urban challenges, infrastructural projects and policy responses in Manesar.

**2.3. Data Analysis:** The collected data were analyzed using a descriptive approach. Population and employment trends were studied to understand the pace of urbanization and its implications for housing and transport demand. Content analysis of policy documents, reports and newspaper articles helped identify recurring challenges and evaluate the effectiveness of planning interventions. The combined analysis provided a comprehensive understanding of the relationship between urban growth and sustainability challenges in Manesar, forming the basis for proposing integrated urban planning solutions.

### **3. Result and Discussion: -**

The findings of this paper provide critical insights into the existing transportation scenario, infrastructural challenges and future development prospects of Manesar. The results highlight the growing pressure on NH8 as the primary corridor, the inadequate condition of alternative routes and the rising demand for efficient public transport and cargo movement facilities. Furthermore, the analysis underscores the importance of proposed government interventions, including new road networks and corridor developments, in shaping the future connectivity of the region. IMT Manesar was conceived as an Industrial Model Township, including residential, commercial, office and industrial facilities. That is why it was aptly named IMT (Integrated Model Township). This region was anticipated to see urban expansion driven by the establishment of industries and the IT sector, along with planned municipal activities. Given its extensive array of functioning industrial units, it is fitting to designate it as an integrated industrial park. Figure 2 shows the Gurgaon – Manesar urban Complex - 2031 AD. Figure illustrates the final development plan prepared by the DTCP, Haryana, to guide urban growth and infrastructure development up to 2031. It highlights the zoning of land into residential, commercial, industrial, institutional, public utility and green areas, ensuring a balanced distribution of space for housing, economic activity and ecological conservation. Major highways, sector roads and proposed transport linkages with Delhi and surrounding regions are shown to enhance connectivity and reduce congestion. Provisions for public services, educational institutions, health facilities and recreational spaces have been incorporated to support the growing population.

**Fig 2: Gurgaon – Manesar urban Complex - 2031 AD**



Source: DTCP, Haryana (2010a)

However, due to several challenges, investors in IMT Manesar are witnessing limited occupier demand, which has slowed down overall development and even led to the shutdown of certain industrial units. The key concerns that require attention (HSI IDC, 2014) include:

- Heavy traffic congestion at the toll plaza, resulting in delays and higher access costs.
- Poor public transport linkages and connectivity.
- Rising number of non-operational industrial units and vacant IT parks.
- Decline in employment opportunities since 2009.
- Inadequate parking provisions for heavy vehicles and trucks.
- Shortage of both general housing and worker-specific accommodation.
- Increasing challenges in land acquisition for future projects, along with disputes over enhanced compensation for already acquired land.
- Potential threat of flash floods owing to poor storm water drainage systems.

**I. Causes of traffic congestion in Manesar (Existing transport infrastructure and its limitations):**

Manesar has experienced rapid industrialization, commercial expansion and population growth in recent decades, but its road and public transport systems have not developed at the same pace. The area primarily depends on a few arterial roads and highways, which are heavily burdened by the simultaneous movement of industrial freight, commuter traffic and local transport. Limited public transport options, inadequate road capacity, poor connectivity within residential and industrial clusters and the absence of efficient last-mile connectivity further intensify congestion. These constraints not only slow down mobility but also contribute to rising travel time, fuel consumption

and vehicular pollution. The toll plaza between Gurgaon and Manesar results in significant delays, elevating employers' expenses and contributing to pollution (Fig 3a). IMT Manesar need sufficient daily services for loading and unloading. Consequently, truck traffic in this region has always been a significant management concern. Trucks idling on the roadways contribute to traffic congestion in the vicinity (Fig 3b). Manesar has always been susceptible to floods owing to its closeness to the southern highlands. The runoff from the hills during the wet season might create several problems for Manesar (Fig 3c).

**Fig 3: (a) Toll Plaza between the city of Gurgaon and Manesar; (b) Trucks idling along the roads; (c) Flooding in Manesar**



Source: HSIIDC (2014)

Figure 4 shows the existing transport network linking Manesar with its surrounding areas and the National Capital Region (NCR).

**Fig 4: Major road connectivity in Manesar region**



Source: DTCP (2010b)

The map highlights National Highway-8 (NH-8) as the principal arterial road, which runs through Manesar and connects it with Delhi to the northeast and Jaipur/Rewari to the southwest. In addition to NH-8, several state highways such as SH-26 (Pataudi Road) and SH-13, along with local roads, provide regional connectivity. The map also indicates radial connections extending outward toward important destinations like New Delhi, Vasant Kunj, Faridabad, Sohna, Rewari, Basai, Sultanpur, and Jhajjar. Gurgaon city, situated northeast of Manesar, serves as a major hub where multiple road networks converge. The rapid growth of Manesar as an industrial and residential hub has brought to the forefront several infrastructural challenges related to traffic management, connectivity and cargo movement. Efficient transportation and smooth logistics are vital for sustaining industrial activity and supporting the workforce of the region. However, existing road networks and transport facilities face pressure due to increasing vehicular load, inadequate public transport systems and the growing demand for better connectivity with neighboring urban centers and the airport. In this context, the following aspects require close examination:

- **NH8- Manesar Industrial Estate Road Chowk:** The intersection at NH8 and the Manesar Industrial Estate forms a three-arm junction that experiences heavy traffic flow. The significant movement of trucks to and from the industrial estate further intensifies congestion, leading to conflicts between through-traffic and turning vehicles and resulting in considerable delays.
- **Connectivity between Gurgaon and Manesar:** The linkage between Gurgaon and Manesar is of strategic importance, as both regions are anticipated to expand in tandem. Presently, three main roads connect the two areas: NH8, Khandsa Road and Pataudi Road. However, connectivity is largely dependent on NH8, since the condition of the other two routes remains poor. Public transport needs are partly addressed by mini-buses operating along this corridor, while trucks also utilize these routes to access Manesar. In addition to serving as an industrial hub, IMT Manesar functions as a satellite town to Gurgaon, making efficient connectivity even more crucial.
- **Cargo Movement between Manesar and the Airport:** NH8 serves as the principal corridor linking Manesar with the airport and will continue to play this role in the future. The two toll plazas along this stretch are equipped to accommodate Multi-Axle Vehicles (MAVs). Given Manesar's location between NH8 and the proposed KMP Corridor, future airport connectivity can also be facilitated through the KMP route. It is therefore suggested that the Airport Master Plan should integrate seamless connectivity to the airport via both NH8 and the KMP Corridor.

Following are some other factors which contribute to traffic problems and transport issues in Manesar tehsil:

- **High Vehicle Ownership:** Manesar has witnessed rapid industrial and residential growth, resulting in high levels of private vehicle ownership. With insufficient public transport options, residents and workers depend heavily on cars and two-wheelers for commuting. This surge in private vehicle use directly contributes to traffic congestion on major arterial roads and within industrial clusters. The growing employment opportunities in Manesar continue to attract migrants, thereby increasing the rate of motorization. The existing road network and traffic infrastructure are not designed to accommodate such a rapid increase in vehicles and projections indicate that urban infrastructure will soon be severely strained if current trends persist.

- **Poor Public Transport Penetration:** Public transport services remain underdeveloped in Manesar. Bus services are irregular and insufficient, while metro connectivity is still in planning. The lack of a robust and reliable system forces residents to opt for private modes, adding to the already overloaded road networks.
- **Road Expansion:** While new roads and flyovers have been proposed to ease congestion, global urban planning experiences show that road expansion often induces more traffic. In Manesar, without addressing the root cause of high private vehicle dependency and lack of alternatives, adding more roads will not provide long-term relief.
- **Parking Issues:** Parking is another major contributor to congestion. Cars and commercial vehicles often occupy roadside areas due to the absence of adequate parking infrastructure. This encroachment reduces road capacity, disrupts traffic flow and poses safety risks for pedestrians.
- **Non-Compact Urban Design:** Manesar's urban design lacks compactness and integration, with residential areas and industrial hubs being dispersed. This makes it difficult for public transport systems such as buses and para-transit services to penetrate deep into neighbourhoods. As a result, access to public transport is inconvenient, pushing commuters further towards private vehicle use.

## II. Housing shortage issues in Manesar:

The issue of housing shortage in Manesar has emerged as a major challenge in the context of its rapid industrial and urban expansion. With the establishment of industrial hubs and large-scale infrastructure projects, the town has experienced a sharp rise in population due to the influx of workers, professionals and migrants. However, the growth in housing supply has not kept pace with the rising demand, resulting in a mismatch between availability and requirement. This shortage has not only pushed up property prices and rental values but has also led to the proliferation of unplanned settlements and inadequate housing conditions. According to the Policy on the construction of Industrial Colony dated July 9, 2013, IMT Manesar is required to dedicate a minimum of 3% of its land for worker housing and an extra 12% for general housing construction. Currently, just 0.1% of the land is designated for worker housing, whereas 3.3% is allotted for general housing, including economically weaker sections. A significant challenge for an industrial sector is the continual acquisition of trained labor. IMT Manesar has a persistent challenge in sourcing trained labor due to many factors, including inadequate housing and connection, as well as dependence on the migration of skilled workers from other industrial regions.

Furthermore, HSIIDC has partitioned the industrial area into seven sectors: the first sector is designated for residential development, the second for commercial purposes, while the other sectors are allocated for industrial development. The CMP (Comprehensive Mobility Plan) study categorizes the industrial area into five zones, numbered 121 to 125. The projected current and future employment is shown as follows:

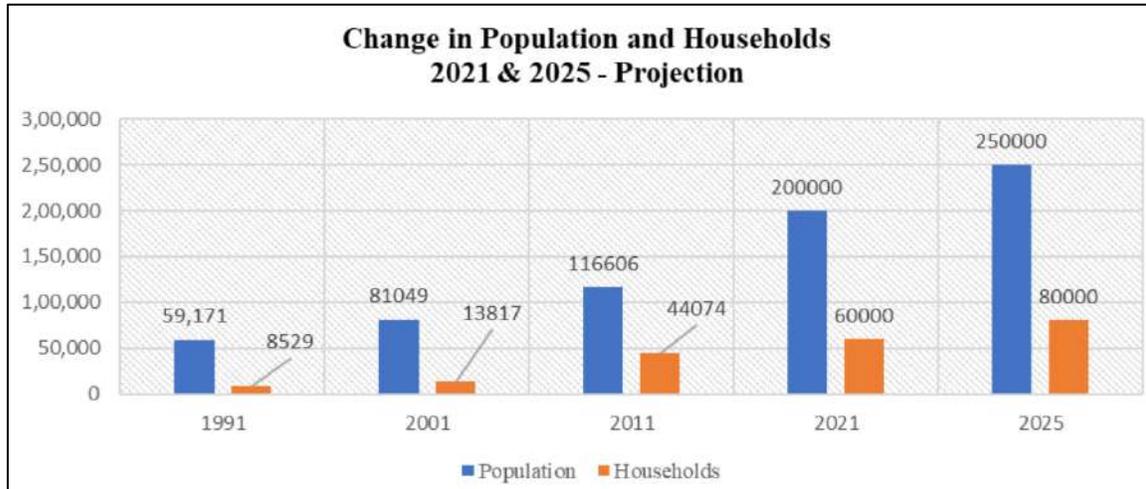
**Table 1: Estimated present and future employment**

Zones	Population (2011)	Employment (2011)	Population (2021)	Employment (2021)	Population (2031)	Employment (2031)
121	2,164	16,648	2,662	19,978	3,031	24,773
122	1,875	17,790	2,034	21,348	2,151	26,472
123	2,283	45,414	2,924	54,497	3,397	67,576
124	2,160	35,515	2,654	42,618	3,019	52,846
125	2,756	2,000	3,954	3,900	4,839	4,836

Source: DTCP (2010b)

Figure 5 depicts the change in population and households of Manesar Tehsil, District Gurugram, from 1991 to 2011, along with projections for 2021 and 2025. The chart clearly highlights the rapid pace of urbanization and demographic growth in the region. In 1991, the population stood at 59,171 with only 8,529 households. By 2001, both population (81,049) and households (13,817) showed a steady increase. This trend accelerated significantly by 2011, when the population reached 1,16,606 and households rose to 44,074, indicating the beginning of large-scale industrial and residential development in Manesar. Projections suggest that the population will nearly double by 2021, reaching 2,00,000 with around 60,000 households and further expand to 2,50,000 people and 80,000 households by 2025. The figure highlights a consistent mismatch between population growth and household availability, underscoring the housing shortage challenges faced by the region. This demographic surge reflects the impact of industrialization, migration, and economic opportunities, while simultaneously pointing to the urgent need for planned housing and infrastructure to sustain this growth.

**Fig 5: Change in population and households (2025-Projection) of Manesar Tehsil, District Gurugram, Haryana**



Source: Dev et al. (2023)

Moreover, the Manesar area is undergoing fast urbanization, population expansion, economic development and the creation of new job opportunities, resulting in a significant need for superior transportation infrastructure. The cost of land and plots has escalated to unprecedented levels due to the development of new industrial infrastructure. Manesar has emerged as a favoured location for developers (Chananiya, 2024).

### III. Suggestions for sustainable urban planning strategies for Manesar:

The rapid pace of population growth and urban expansion in Manesar has brought forth pressing challenges related to housing, infrastructure, transportation and environmental sustainability, making it essential to adopt well-structured urban planning strategies. As the projections indicate a steep rise in both population and households in the coming years, unplanned development could exacerbate issues such as congestion, pollution and resource scarcity. The govt. has taken steps to address these problems. Construction of long-delayed flyover at Manesar is under progress (Figure 6a). Manesar experience congestion during peak hours. This segment of NH8, from Delhi to Jaipur, is among the most congested highways, characterized by substantial industrial traffic, commercial vehicles and everyday commuters.

**Fig 6: (a) Development of flyovers in Manesar town; (b) Removing of illegal encroachments**



(a)

(b)

**Source: Gupta (2025) and Behl (2025)**

For years, road users have encountered congestion in Manesar, especially at peak hours (Gupta, 2025). In view of this, HSIIDC is also aiming to expand the roadways leading to Manesar by eliminating encroachments (Figure 6b). This encompasses a 500-meter segment of a 16.5-foot-long village road in Kasan and a 500-meter segment of a 66-foot-long major road in Khoh. The expansion of these roads will not impact traffic. Vineet Kumar, the HSIIDC manager, said that unlawful constructions over the last several years had reduced the 66-foot-wide road to about 30 feet, resulting in recurrent traffic congestion (Behl, 2025).

Furthermore, the Development Plan–2021 for the Gurugram–Manesar Urban Complex outlines a wide range of transport infrastructure projects aimed at addressing the region’s rising mobility demands. Key proposals include the construction of a 90-metre-wide road connecting Delhi’s Vasant Kunj with Mehrauli Road in Gurugram and another 90-metre-wide corridor linking Andheria Mor in Delhi to Gurugram’s Faridabad Road via Mandi and Gual Paheri. The plan further recommends a 150-metre-wide road between Dwarka and Palam Vihar, supported by the adoption of a Density Graph Integrated Mobility Plan for the entire complex by 2021. Expansion of the Delhi Metro Rail Corporation (DMRC) network is also prioritized, with proposed extensions covering the Sushant Lok Phase I corridor and the Dwarka line, extending through Manesar up to the Kundli–Manesar–Palwal (KMP) Expressway. In addition, the plan calls for the development of a 150-metre-wide Northern Peripheral Road and a 90-metre-wide Southern Peripheral Road to strengthen regional connectivity and ease traffic congestion in this rapidly urbanizing zone (Chananiya, 2024). These measures may help in addressing the traffic and transport related problems. The increasing gap between road infrastructure and traffic volume highlights the need for immediate interventions to ensure smoother flow and reduce bottlenecks. In this context, traffic engineering measures become essential as they offer practically implementable solutions to address the existing challenges while paving the way for long-term sustainable transport planning. Following recommendations are made in this paper as part of short-term traffic engineering measures:

- a) **Intersection Redesign:** Congestion in Manesar is often concentrated at intersections due to poor design and unmanaged traffic flows. Redesigning intersections with traffic signals, roundabouts and channelization measures can reduce delays, improve safety and enhance road capacity.
- b) **Development of Footpath-cum-Drains:** Building footpaths integrated with stormwater drains serves dual purposes: providing safe pedestrian pathways and improving drainage to prevent waterlogging during monsoons. This not only supports walkability but also strengthens urban resilience.
- c) **Pedestrian Crossing Facilities:** Safe and accessible pedestrian crossings, including zebra crossings, signals and skywalks at high-traffic zones, are necessary to protect pedestrians and encourage walking as a viable mode of transport.

- d) **Parking Management:** Unregulated parking is a major cause of congestion in Manesar. Introducing multi-level parking facilities, strict no-parking zones and digital parking management systems can optimize land use and reduce encroachment on streets.
- e) **Public Transport Plan:** A comprehensive public transport strategy is essential. Expanding city bus services, introducing e-buses and integrating future metro connectivity with feeder services will reduce private vehicle dependency.
- f) **Bicycle Lanes:** Dedicated bicycle lanes should be created to encourage non-motorised transport, especially for short trips within industrial and residential areas. This will promote healthy, eco-friendly mobility while reducing road congestion.
- g) **Existing Market Traffic Improvement:** Markets in Manesar often face congestion due to loading/unloading and street vendors. Designating delivery hours, organizing vending zones and improving circulation within market areas will enhance traffic flow.
- h) **Regulation of Auto Rickshaws:** Auto rickshaws are crucial for short-distance mobility but contribute to disorderly traffic when unregulated. Designated stands, digital permits and route-based regulation will improve efficiency.
- i) **Cycle Rickshaw Regulation:** Cycle rickshaws provide affordable last-mile connectivity but need proper regulation. Allotting rickshaw stands and managing their movement in busy corridors will integrate them smoothly into the transport network.
- j) **Enforcement:** Strict enforcement of traffic laws, parking rules and pollution standards is vital. Using CCTV surveillance, traffic police deployment and smart monitoring systems can ensure compliance.
- k) **Improve and Scale Up Public Transport & Last-Mile Connectivity:** Reliable last-mile connectivity through feeder buses, shared autos and e-rickshaws is critical for making public transport attractive. Scaling up these services will reduce reliance on personal vehicles.
- l) **Implement Non-Motorised Network Plan:** A time-bound plan to develop cycling and pedestrian infrastructure is essential. Ensuring continuity of footpaths and cycle tracks will make non-motorised transport safe and accessible.
- m) **Restrain Growth of Cars:** Policies to discourage excessive car usage include higher parking charges, congestion pricing and taxes on multiple vehicle ownership. Such demand management measures are important for sustainable urban mobility.

Hence, sustainable urban planning for Manesar requires an integrated approach that goes beyond road expansion and vehicle-centric solutions. By redesigning intersections, creating pedestrian-friendly pathways and developing efficient parking management systems, the town can improve traffic flow and safety. Strengthening public transport and ensuring last-mile connectivity, along with the development of dedicated bicycle lanes and non-motorised transport networks, will promote greener mobility choices. Regulation of auto-rickshaws and cycle rickshaws, coupled with strict enforcement of urban transport policies, can further reduce congestion and improve commuter experience. At the same time, market traffic management and parking restraints, including the use of taxes, can discourage excessive car dependency.

While these mobility-focused measures are crucial, they alone cannot guarantee a sustainable future for Manesar unless the equally pressing issue of housing is addressed. The rapid pace of industrialization and urban expansion has led to a severe mismatch between the growing housing demand and the available supply. The influx of migrant workers, professionals and their families has put immense pressure on the existing housing stock, resulting in overcrowding, rising real estate prices and the proliferation of informal settlements. Addressing this housing challenge requires a holistic approach that balances affordability, sustainability and inclusivity. In this context, the following suggestions are proposed to tackle the housing problem in Manesar, with an emphasis on meeting the needs of diverse income groups while ensuring planned and sustainable urban growth:

- a) **Promotion of Affordable Housing Projects:** The government, in collaboration with private developers, should initiate large-scale affordable housing schemes specifically designed for economically weaker sections (EWS) and low- to middle-income groups (LIG/MIG). This would help in reducing the gap between housing demand and supply, ensuring that a significant portion of the workforce engaged in Manesar's industrial sector can access decent living spaces at reasonable costs.
- b) **Encouragement of Vertical Expansion:** Given the scarcity of land and rapid urbanization in Manesar, the focus should shift towards vertical development. High-rise apartment complexes can accommodate a larger population on relatively smaller land parcels, thereby optimizing space utilization while simultaneously curbing unplanned horizontal sprawl into agricultural and ecologically sensitive areas.
- c) **Introduction of Rental Housing and Worker Hostels:** Since Manesar attracts a large migrant workforce due to its industrial and IT hubs, there is a growing demand for short-term and affordable rental accommodation. Developing organized rental housing, worker hostels and dormitory-style living spaces can reduce informal and substandard housing practices, improving living conditions for industrial workers.
- d) **Strengthening Land-Use Regulations and Controlling Speculation:** Land speculation and rapid real estate price escalation are major hurdles in housing accessibility. Strict monitoring of land-use policies, transparent property registration systems and deterrents against land hoarding by private players can help stabilize the housing market, making it more affordable for genuine buyers.
- e) **Upgradation of Urban Infrastructure:** Adequate infrastructure is the backbone of sustainable housing. Housing development must go hand in hand with improvements in basic amenities like potable water, sewage systems, drainage, power supply and waste management. Additionally, well-connected road networks and reliable public transport should be developed to integrate residential areas with industrial and commercial zones.
- f) **Green and Sustainable Housing Practices:** Housing solutions in Manesar should emphasize eco-friendly practices, including the use of energy-efficient designs, rainwater harvesting, solar power integration, and sustainable building materials. This will not only reduce the ecological footprint but also lower long-term utility costs for residents.

- g) **Inclusive Neighbourhood and Social Infrastructure Development:** Housing development should not only focus on providing shelter but also ensure access to essential social services. Integrated planning with provisions for schools, healthcare facilities, community centers, parks and recreational spaces would foster balanced urban growth and improve the quality of life for residents.
- h) **Public-Private Partnership (PPP) in Housing Development:** To address the scale of the housing crisis, the government should actively collaborate with private developers through incentives such as land subsidies, tax exemptions or faster approval processes. This approach can accelerate the construction of affordable housing projects.
- i) **Promotion of Co-Living and Shared Housing Models:** With the influx of young professionals and students in the region, co-living arrangements and shared rental housing models can be encouraged as cost-effective and flexible solutions, reducing individual housing burdens while optimizing space.
- j) **Long-Term Housing Finance Solutions:** Affordable financing mechanisms such as low-interest loans, subsidies under government schemes (e.g., PMAY – Pradhan Mantri Awas Yojana), and rental vouchers should be promoted to help middle- and lower-income families own or rent quality housing without financial strain.

Together, these strategies highlight the importance of a holistic, sustainable model that not only addresses current transport and housing challenges but also enhances the long-term environmental and economic resilience of Manesar.

4. **Conclusion:** The study highlights that Manesar, as a rapidly expanding industrial and urban hub, faces significant challenges related to traffic congestion, inadequate road infrastructure and limited public transportation facilities. The existing dependence on NH8 for passenger and cargo movement underscores the urgent need for alternative connectivity solutions and integrated transport planning. The Government's Development Plan-2021 offers a comprehensive framework to address these concerns through proposed expressways, metro extensions and peripheral roads, which, if implemented effectively, can reduce congestion and enhance regional mobility. At the same time, strengthening secondary roads, improving public transport systems and ensuring last-mile connectivity remain critical for achieving balanced growth. Equally important is the housing dimension, as the influx of migrant workers, professionals and their families has created a sharp demand-supply gap, driving up real estate prices and fostering the growth of informal settlements. Sustainable urban planning for Manesar, therefore, must integrate affordable and inclusive housing policies alongside transport and infrastructure development. This would ensure not only better mobility and economic opportunities but also dignified living conditions for all sections of the population. In conclusion, sustainable urban development in Manesar requires a coordinated approach that combines infrastructure expansion, efficient traffic management, inclusive housing strategies, policy interventions and environmentally conscious planning to meet the future mobility, residential and economic needs of the region.

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