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Urbanisation Trends in Bathinda

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Abstract

Bathinda, the largest city in southern Punjab, is undergoing rapid urbanisation, driven by industrial expansion, infrastructural development, and rural-to-urban migration. While this transformation has created economic opportunities, it has also produced significant pressures on civic amenities, transport infrastructure, water resources, and environmental sustainability. This paper examines urbanisation patterns in Bathinda, focusing on major affected roads—Mansa Road, Dabwali Road, Mall Road, Railway Road, and Old City areas— and analyses the impacts of increased traffic volume, water demand, sewerage generation, and solid waste management. Using secondary data from municipal records, census reports, and planning documents, the study highlights the need for sustainable urban planning and effective policy interventions.

Keywords: urbanization, urbanization trends, urbanization impacts, effects of urbanization

INTRODUCTION

Urbanisation is both a driver and a consequence of socio-economic change. In developing countries, it is largely influenced by rural-to-urban migration and natural population growth. Bathinda, with its historical significance and strategic connectivity, unplanned growth and inadequate infrastructure have led to congestion, pollution, and inequitable access to urban services. This study investigates the trends and challenges of urbanisation in Bathinda, with a focus on the most affected transport corridors and associated infrastructure pressures.

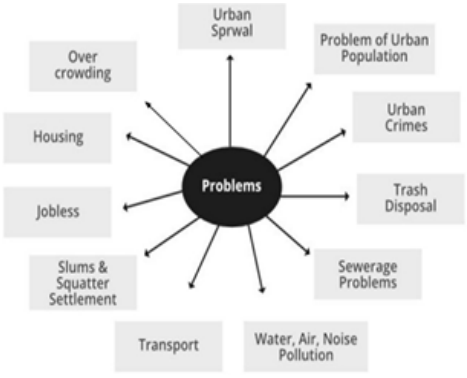


Fig-1 Problems due to urbanisation
Source- Urbanization trends .com

LITERATURE REVIEW & CONCEPTUAL FRAMEWORK

Urbanisation in the Indian context has been studied extensively in terms of causes, patterns, and impacts. According to Marshall et al. (2009), rural-to-urban migration is driven by economic opportunities, better services, and lifestyle aspirations. The impacts of urbanisation are multifaceted, bringing economic growth, better access to health care, and improved infrastructure, but also creating challenges such as overcrowding, inadequate sanitation, and environmental degradation. Bathinda's urban growth has been shaped by industrialisation, improved connectivity, and expansion of municipal limits.

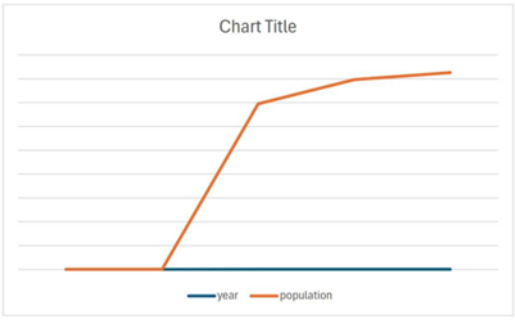


Fig-2 Increase in population with year

Source- By author

STUDY AREA

Bathinda lies in southern Punjab and serves as a major rail and road junction, connected by NH-54, NH-148B, NH-754, and the Amritsar–Jamnagar Expressway. The city's municipal limits were expanded in 2023 to incorporate Naruana and Jodhpur Romana villages, increasing the urban area to 57,198 hectares. It has a mixed economy, with agro-based industries, petrochemical plants, and educational institutions driving migration and growth

Table-3 Population Analysis

Bathinda population	2001	2015	2025
Population	2,17,256	2,85,768	4,39,000
Slum	28,500	34,760	46,640

Bathinda city has experienced significant migration, both from within Punjab and from other states. A study by the Centre for Development Economics and Innovation Studies (CDEIS) of Punjabi University found that 70% of the workforce in Punjab's cities, including Bathinda, comprises migrants from outside the state. Only 30% are from rural Punjab. The majority of these migrants are aged between 26 and 45 years, with 35% being illiterate and 36% having middle-level education

GROWTH OF BATHINDA CITY -

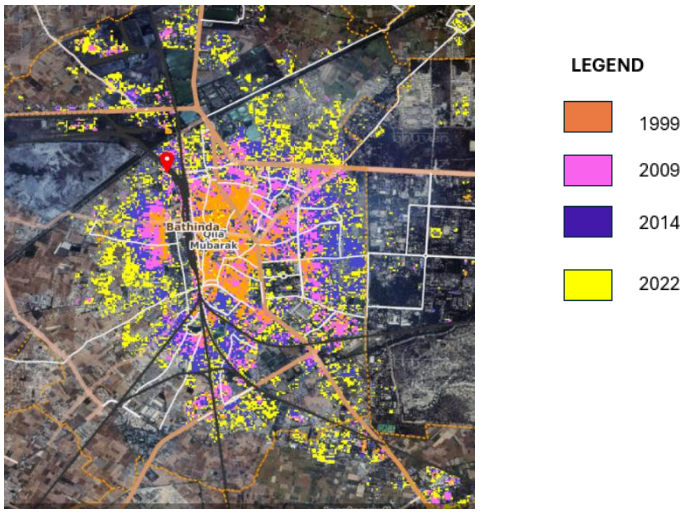


Fig- 4 Growth of the city
SOURCE - ISRO GEOPORTAL

FINDINGS AND ANALYSIS

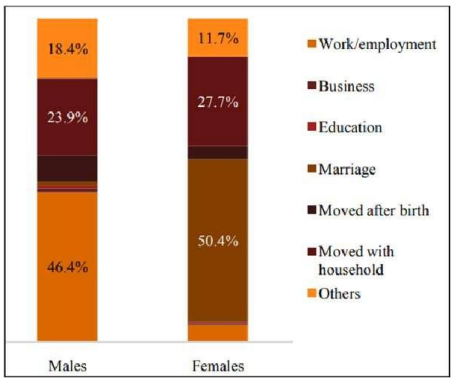


Fig – 5 population growth and migration trends
Source- census 2011

Between 2001 and 2025, Bathinda's population increased from 2.17 lakh to an estimated 4.39 lakh, with slum populations rising from 28,500 to 46,640

Extension in M.C Boundary-

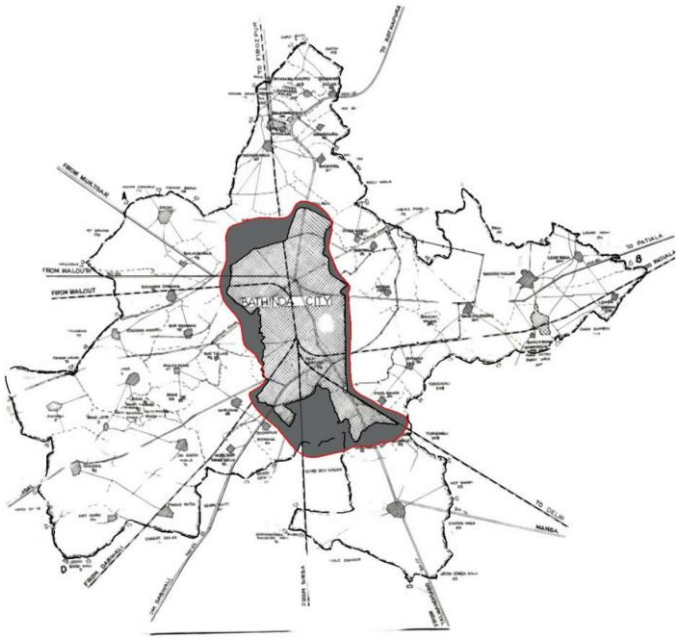


fig-6 extension in m.c limits from to 2010 to present
Source-By Author

Previous And Present Year AQI of Bathinda City –

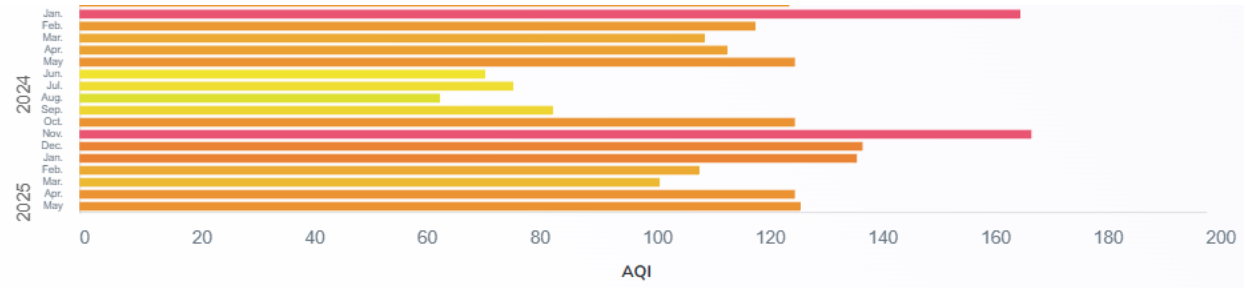


fig-7 air quality index chart
Bar Chart Represents Increase In AQI Year By Year

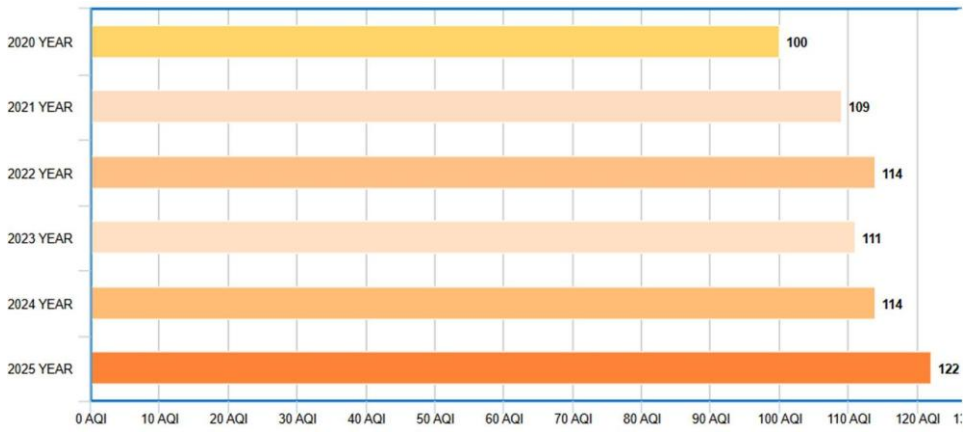


Fig – AQI as respective to changing year
Source-Bathinda Air Quality Index (AQI) Real-Time Air Pollution

Major affected roads of Bathinda –

Infrastructure pressure-

Mansa road –

- Sewerage-

In 2010 – generation of sewerage is 8.8 mld
In 2025 – generation of sewerage is 17 mld
According to urdpfi – 108 lpcdx population
=10.4 mld gap=6.6mld

2010	8.8
2025	17
As per urdpfi	108 lpcd=10.4mld
gap	6.6 mld

Source- by author

- Water supply-

Water demand in 2025 is 15.1 mld , As per urdpfi – 135 lpcd = 13 mld
Gap=2

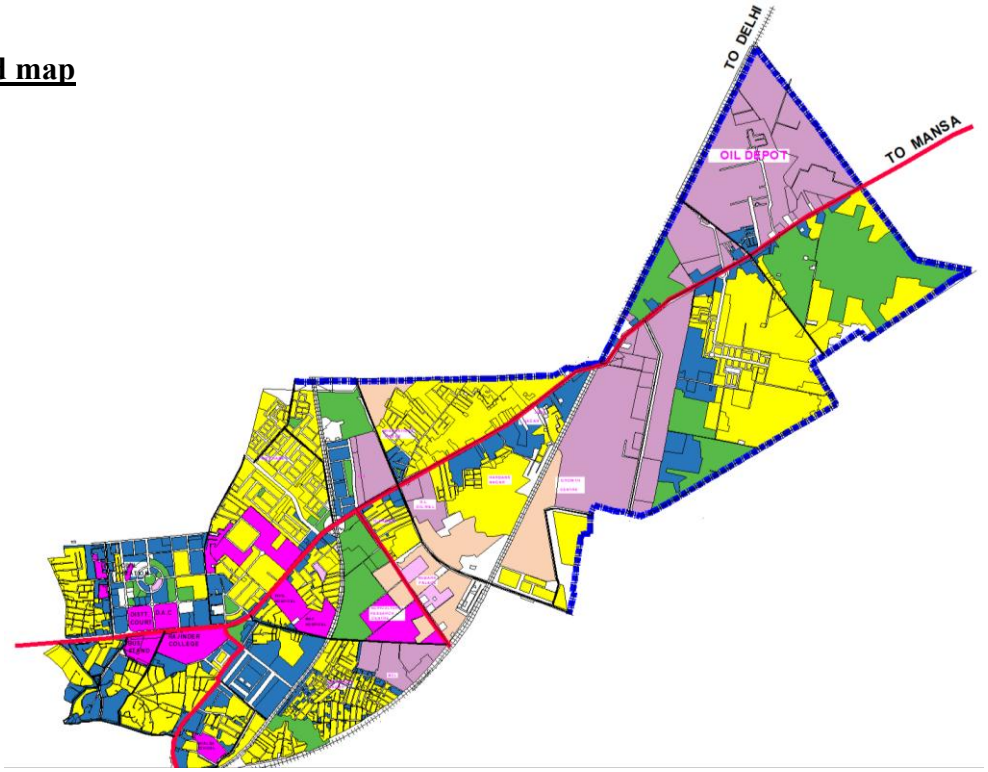
Year	2025
Water supply (lpcd)	156
Water demand (mld)	15.1
As per urdpfi	135
In mld	13
gap	-2

- Solid waste –

Generation of solid waste =26.66 , tn /day, In 2025- 51.66tn/day
As per urdpfi -24 tn/day
Gap = -27.66 tn/day

2010	26.66
2025	51.66
As per urdpfi	0.250per hh=24tn/day
gap	27.66tn/day

Mansa road map



Railway road -

- Water supply -

In 2025 water demand -16.1 mld , As per urdpfi – 16.7mld
Gap- 0.6 mld

Year	2025
Water supply (lpcd)	156
Water demand (mld)	16.1
As per urdpfi	135
In mld	16.7
gap	0.6

Source- by author

- Solid waste-

Generation of solid waste (2010)-41.98 tn/day
In 2025 - 66.1 tn/day , As per urdpfi – 30 tn/day
Gap – 36.1 tn/day

2010	41.98 tn/day
2025	66.1 tn/day
As per urdpfi	0.250per hh =30 tn/day
Gap	36.1 tn/day

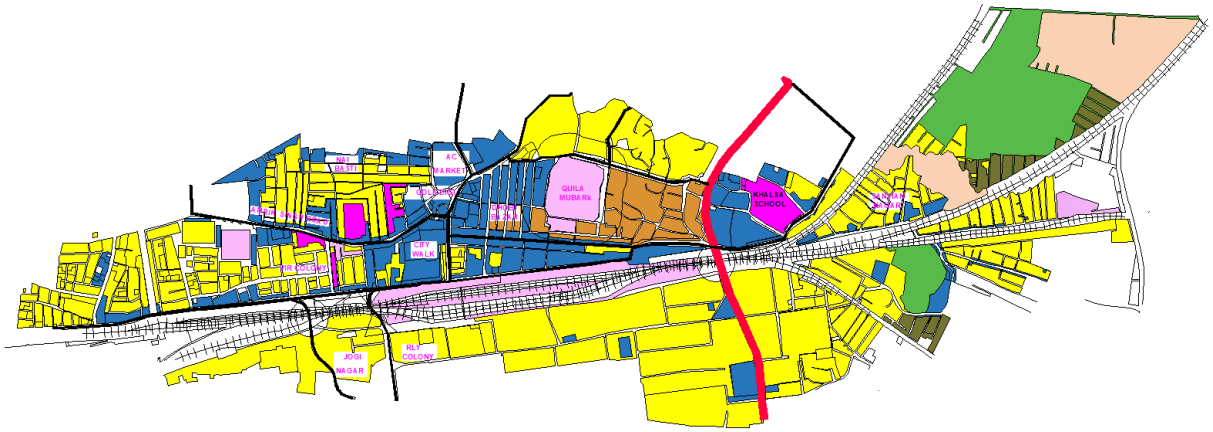
Source – by author

- Sewerage-

generation of sewerage in 2010is 13.8 mld
In 2025- 21.8mld , As per urdpfi – 13.3 mld
Gap=8.5 mld

2010	13.8
2025	21.8
As per urdpfi	108 lpcd =13.3 mld
Gap	8.5 mld

Source- by author



Mall road -

- Water supply –

In2025 ,water demand 16.3 mld, as per urdpfi – 14.1 mld
Gap = - 2.2 mld

Year	2025
Water supply (lpcd)	156
Water demand (mld)	16.3
As per urdpfi	135
In mld	14.1
Gap	-2.2

Source – by author

- Solid waste –

Generation of solid waste =32 tn (2010), IN 2025 = 56 TN/DAY
As per urdpfi- 26 tn/day , gap =30 tn/day

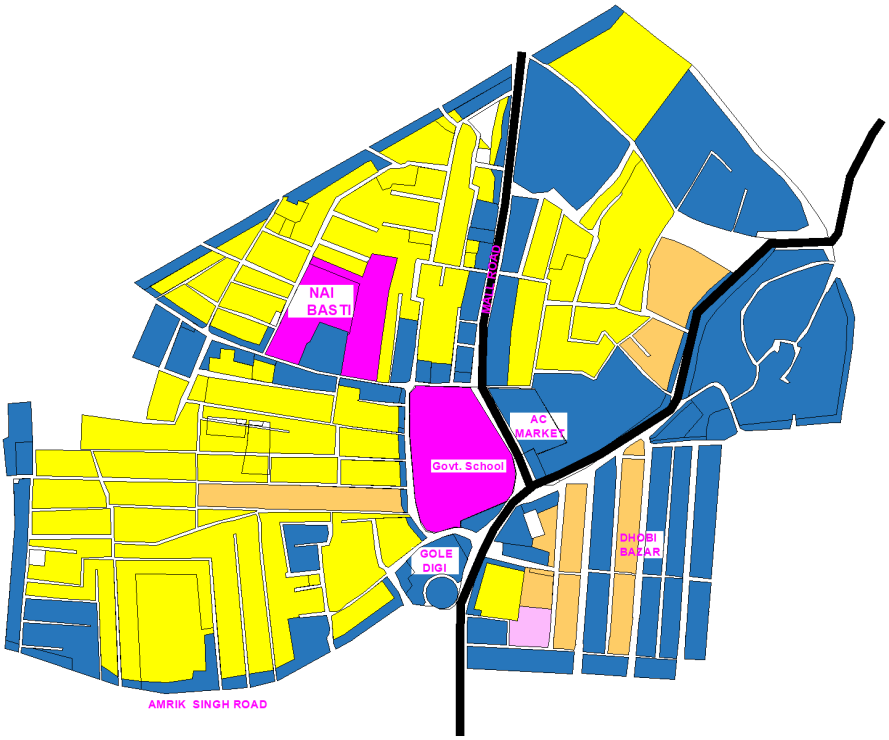
2010	32
2025	56
As per urdpfi	0.250 per hh = 26 tn/day
Gap	30 tn/day

Source – by author

- Sewerage –

Generation of sewerage in 2010 - 7.95 mld , in 2025 - 18.5 mld
As per urdpfi – 11.3 mld
Gap = 7.2 mld

2010	7.95
2025	18.5
As per urdpfi	108 lpcd = 11.3 mld
Gap	7.2 mld



Dabawali road-

- Water supply –

Water demand in 2025 is 12.6 mld

Year	2025
Water supply (lpcd)	120
Water demand (mld)	12.6
As per urdpfi	135
In mld	14.1
Gap	1.5

Source- by author

- Solid waste-

Generation in 2025 -56 tn/day

2010	26
2025	56
As per urdpfi	0.250 per hh = 26 tn/day
Gap	30 tn/day

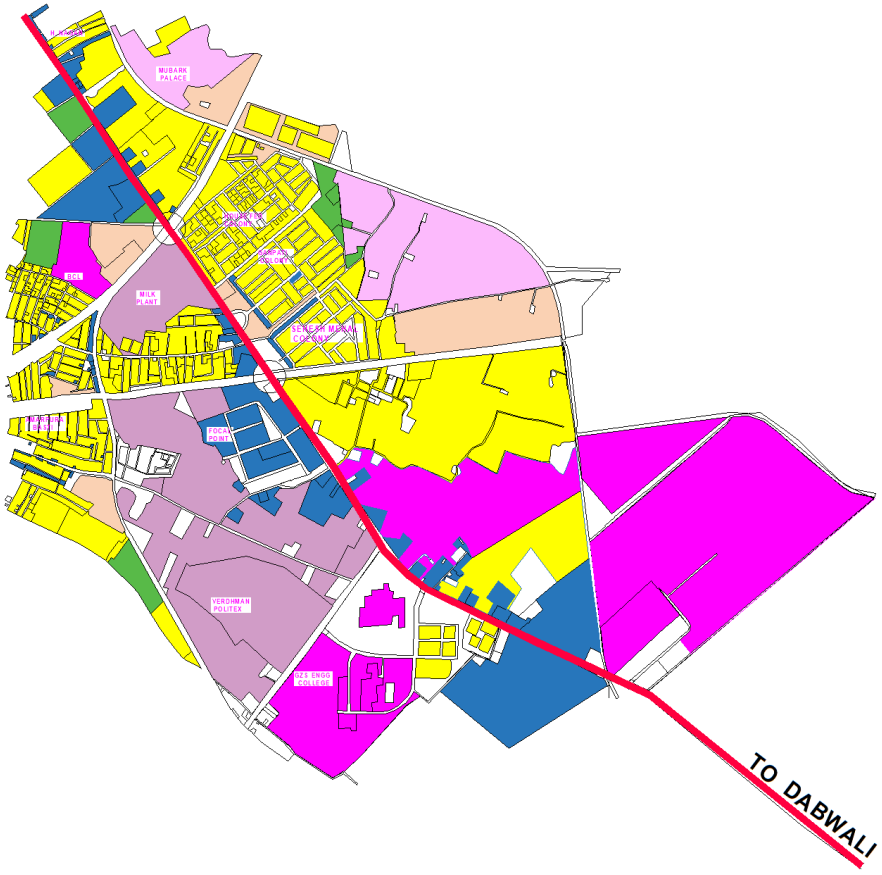
Source- by author

- Sewerage-

Generation of sewerage in 2010- 8.8 mld, In 2025 – 18.5 mld
As per urdpfi – 11.3 mld
gap-7.2 mld

2010	8.8
2025	18.5
As per urdpfi	108 lpcd = 11.3 mld
Gap	7.2 mld

Source- by author



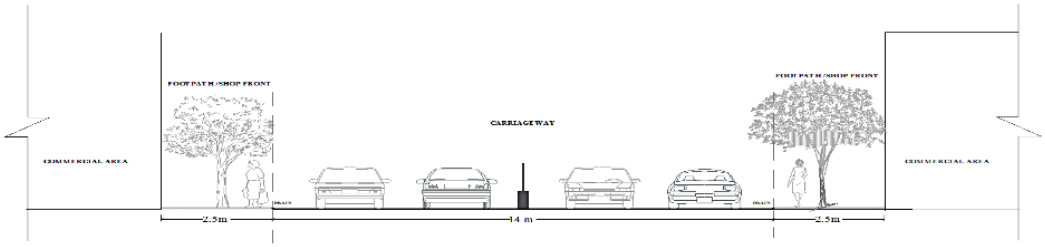
RECOMMENDATIONS

Urbanisation in Bathinda is inevitable, but its trajectory must be guided towards sustainability.

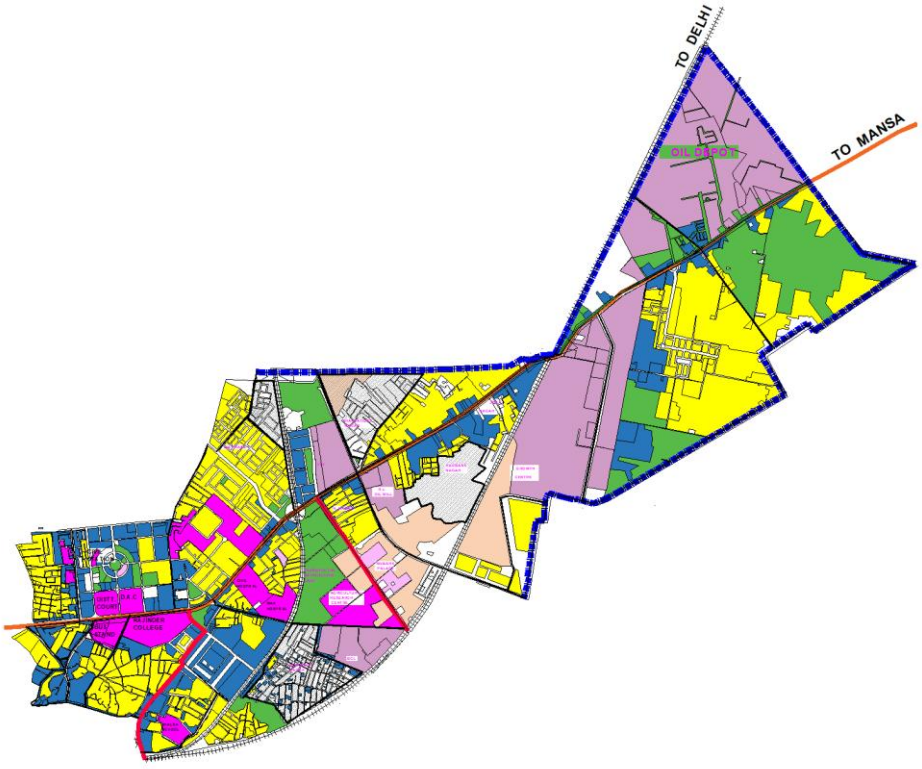
Mansa road -

Traffic

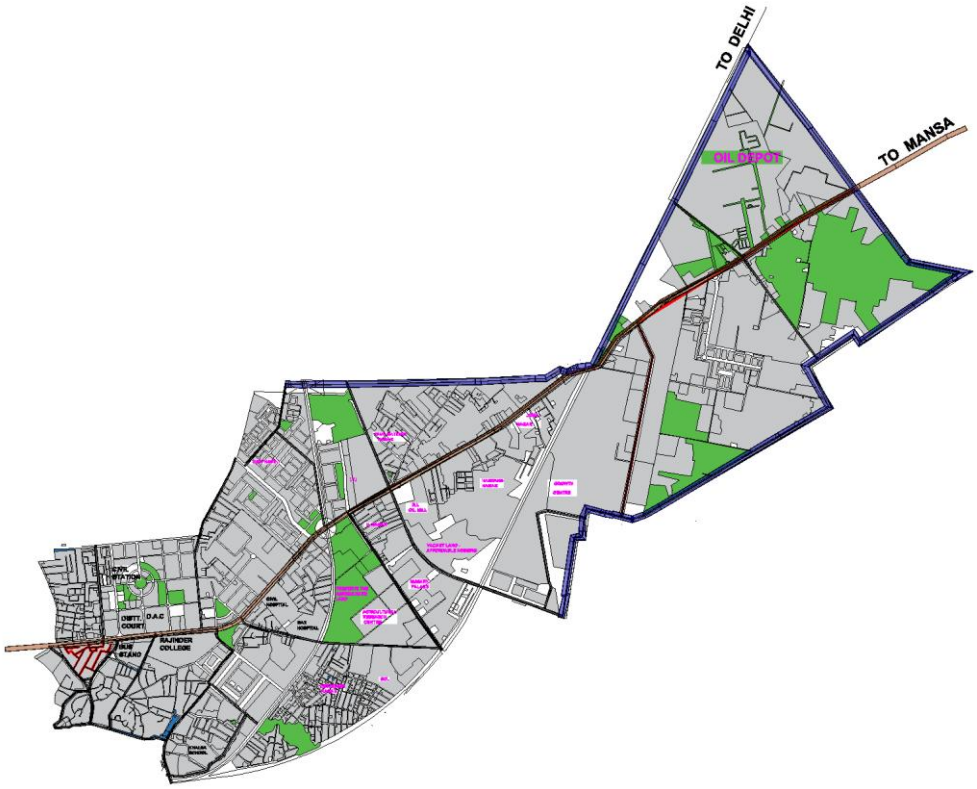
1. Widening of mansa road from 11m to 14 m .



2. construction of overhead reservoirs of capacity 1.5 lakh litre near the unserved wards



3.Install 3 modular DSTP'S (3 modular capacity each)
Proposal-
Submain Pipe to be laid down on the internal road of dia of 150 mm and length of 210 m



3. Solid waste-

the proposal is to expand the site- is to increase the capacity of the site

Railway road-

Traffic-

Allocate space to auto rickshaws, so that they can stand there, it helps to reduce congestion on the road

Parking space area to be adopted to park the auto rickshaw is 60 sqft.

One major reason of the congestion on the road is parking of the auto

So, the proposal is to allocate the space for parking of auto rickshaw

Area given for parking of 20 auto rickshaw is (as observed 20 autos per time is standing near the station) 1200 sq ft

Sewerage-

Proposal –

In railway road , as per the urdpfi the gap of generation of sewrage is 8.5mld .

Proposal is Decentralized Sewage Treatment Plant-

Install DSTPs (12 MLD capacity)

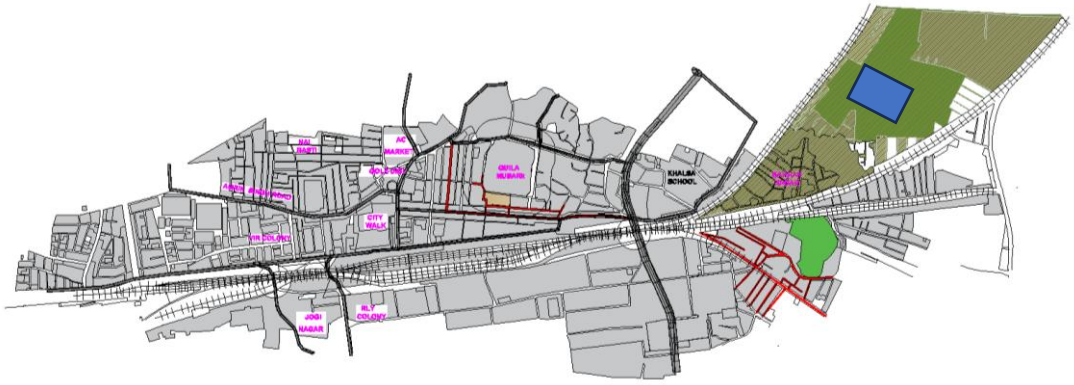
Proposed at the boundaries so that the foul smell doesn't disturb the residential and commercial area and located near the green area so, that the tress and green spaces act as a buffer zone between the plants and the other development

Proposal-

Submain Pipe to be laid down on the internal road of dia of 150 mm and length of 310 m

Proposal-

Submain Pipe to be laid down on the internal road of dia of 150 mm and length of 300 m

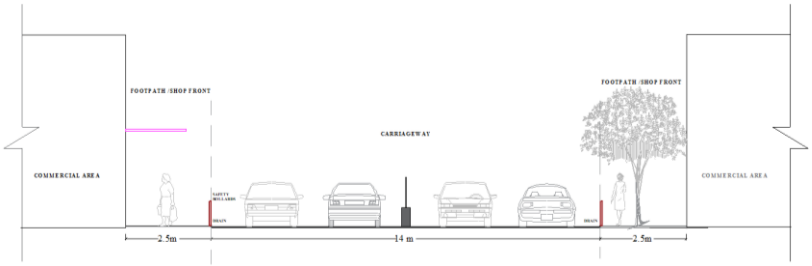


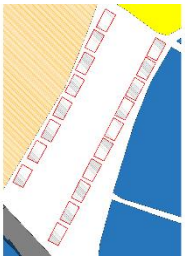
Mall road-

- **Traffic**

Proposal –

1. Remove unauthorized kiosks, stalls and parked veichels that occupying pedestrian space.
2. Installtion of safety bollards along the footpaths for safety of pedestrians.and to restrict traffic to enter in the footpath.

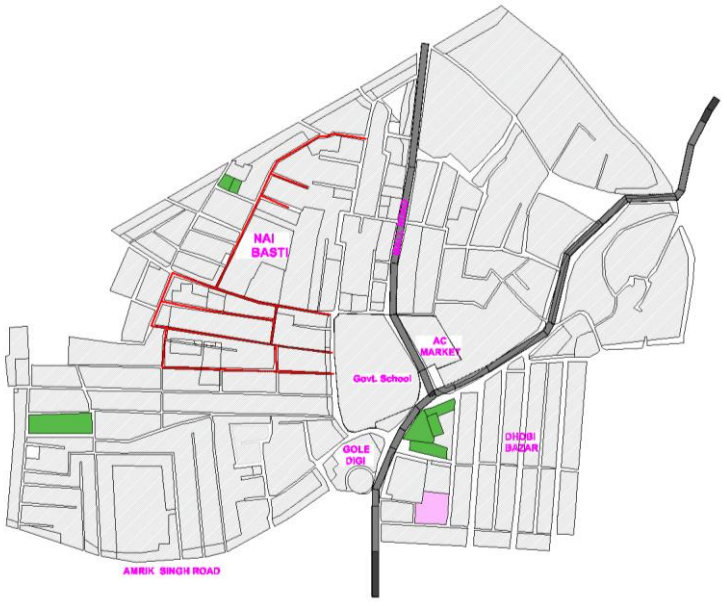




8'x16' space Alloted to one kiosk So that it doesn't move any other place

- Water supply-

Proposal – Construction of overhead storage tanks of capacity 5 lakh litre tank In the subash park for proper water supply to the unserved wards . Overhead tanks are marked in the plan

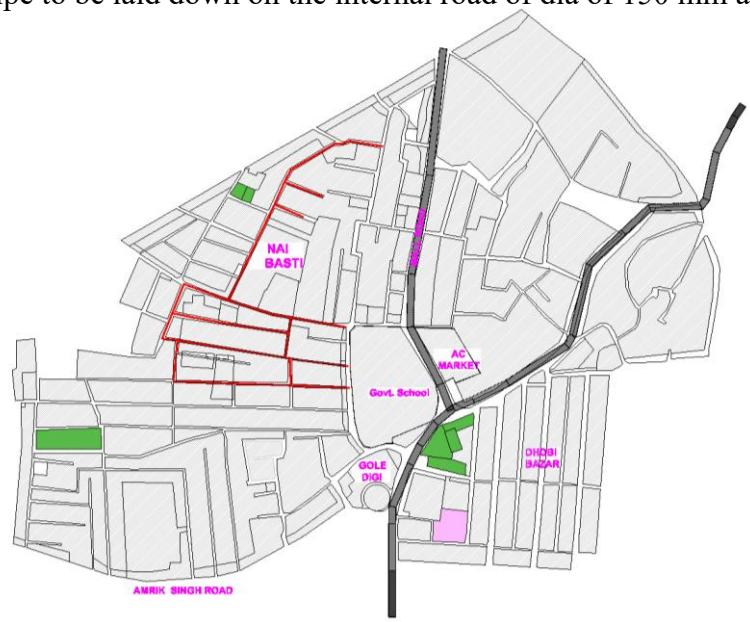


Sewerage-

Proposal –

- Extend sewrage pipelines to cover unconnected residential and commercial areas
- Enforce proper connection of all new commercial buildings to the sewrage system through urban building byelaws

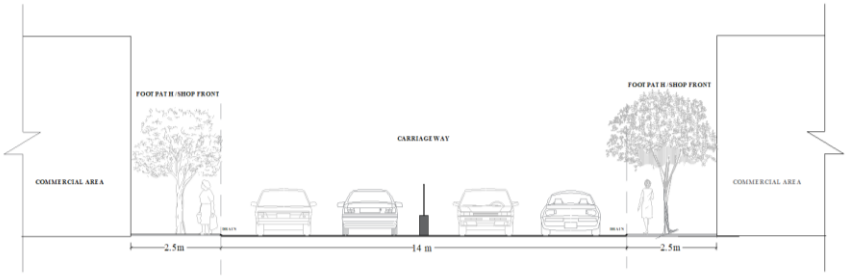
Proposal-Submain Pipe to be laid down on the internal road of dia of 150 mm and length of 500 m



Dabwali road-

- .Traffic

Proposal –
Widening of road from 11 m to 14



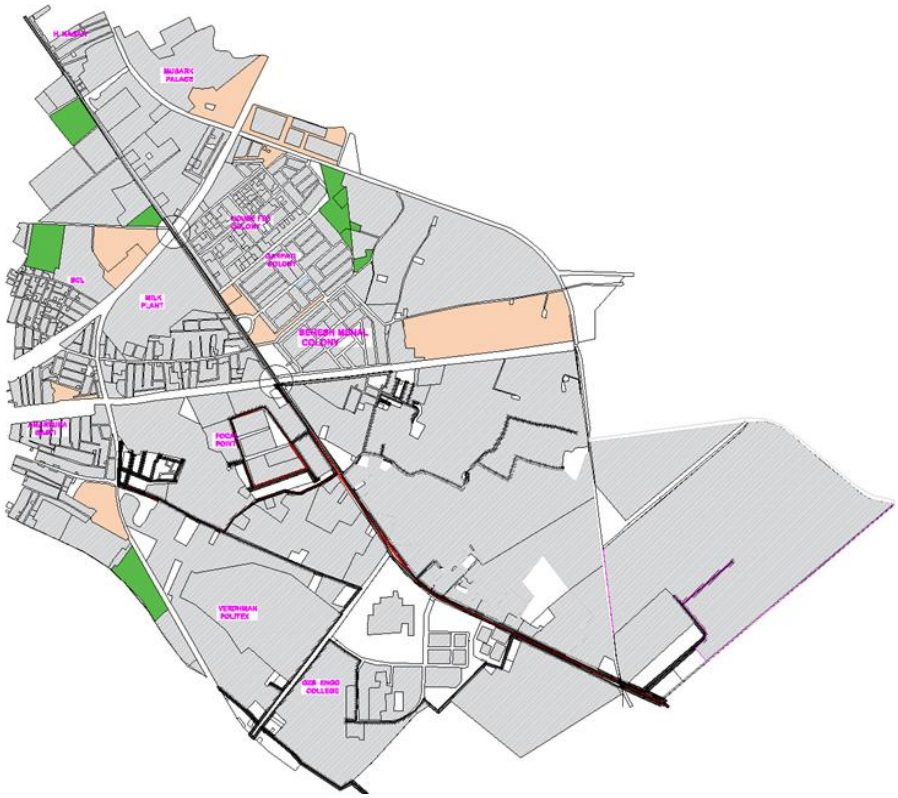
- Sewerage-

Proposal –

- Extend sewrage pipelines to cover unconnected residential and commercial areas
- Enforce proper connection of all new commercial buildings to the sewrage system through urban building byelaws

Proposal-

- Main Pipe to be laid down on the internal road of dia of 250 mm and length of 400 m



Proposal-
Submain Pipe to be laid down on the internal road of dia of 150 mm and length of 300 m

CONCLUSIONS-

The study has comprehensively evaluated the urbanization trends in Bathinda city With focus on the affected spots by addressing the issues related to traffic, water Supply, sewerage generation, solid waste in which further added the proposals To reduce the impact of rapid urbanization on the addressed spots during the analysis process.
Future research can build upon this study with additional urbanization impacts.
Ultimately aims to addressing the impacts of rapid urbanization.

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