

Urbanization and Traffic Congestion: A Case Study of Vita City

Nilesh Ramchandra Mandle¹, Deepak Annaso Janawade²

¹Assistant Professor, Balwant College Vita
Tal- Khanapur Dist- Sangli

²Assistant Professor, Jaysingpur College Jaysingpur
Tal- Shirol Dist - Kolhapur

Email: nileshmandle2612@gmail.com

Manuscript ID: **Abstract**

JRD -2025-170937

ISSN: 2230-9578

Volume 17

Issue 9 (V)

Pp. 150-153

Sept. 2025

Submitted: 15 Aug. 2025

Revised: 25 Aug. 2025

Accepted: 10 Sept. 2025

Published: 30 Sept. 2025

Vita city, located in Sangli district, is an important commercial, educational, and healthcare hub. The rapid growth of population and vehicles has created severe urban traffic congestion. This study analyses the geographical causes, impacts, and remedial measures of traffic congestion in Vita city. The methodology included field observation, citizen interviews, and secondary data from RTO and municipal records. Major congestion points identified were Gandhi Chowk, Shivaji Chowk, Karad Road, Tasgaon Road, Vegetable Market, Mayani Road, and the Bus Stand. Narrow roads, lack of parking, unplanned markets, and rising vehicle numbers are the key causes of congestion. Traffic congestion results in time and fuel loss, economic damage, increased accidents, and environmental issues such as air and noise pollution. To mitigate the problem, solutions such as road widening, bypass development, parking zones, smart traffic signals, public transport improvement, and GIS-based planning have been suggested. The study concludes that sustainable urban development requires citizen participation, modern technology, and long-term planning. Improved traffic management in Vita city will provide social, economic, and environmental benefits.

Keywords: Urbanization, Traffic Congestion, Causes, Remedies, Urban Transport Planning.

Introduction

Traffic is the lifeline of socio-economic development in any city. However, with the increase in population and vehicles, small and medium-sized towns are also facing severe traffic congestion. Vita (Taluka Khanapur, District Sangli) is a major commercial and educational hub. Due to markets, schools, colleges, vegetable markets, and the central bus stand, traffic density remains high throughout the day. Located on the routes connecting Karad, Tasgaon, Khanapur, and Mayani, the city also bears the load of external traffic. Hence, traffic congestion in Vita is not just a local but also a regional issue.

Objectives

1. To identify the geographical causes of traffic congestion in Vita city.
2. To study the social, economic, and environmental impacts of congestion.
3. To demonstrate spatial distribution and characteristics of congestion using GIS.

Study Area

Vita city is situated in Khanapur taluka of Sangli district, at 17°27' N latitude and 74°53' E longitude, with an elevation of 560 meters above sea level. The city lies at the junction of Sangli and Satara districts, making it commercially significant. As per the 2011 Census, Vita had a population of 48,289, which is estimated to have increased to around 66,000 by 2025. Surrounding villages include Dhavaleshwar (east), Renavi (east), Gardi and Bhambarde (north), Khambale (Bha) and Karve (south), Vasumbe and Kurli (east), Kalambi (southwest), and Nevri (west).



Quick Response Code:



Website:

<https://jrdrvb.org/>



Creative Commons (CC BY-NC-SA 4.0)

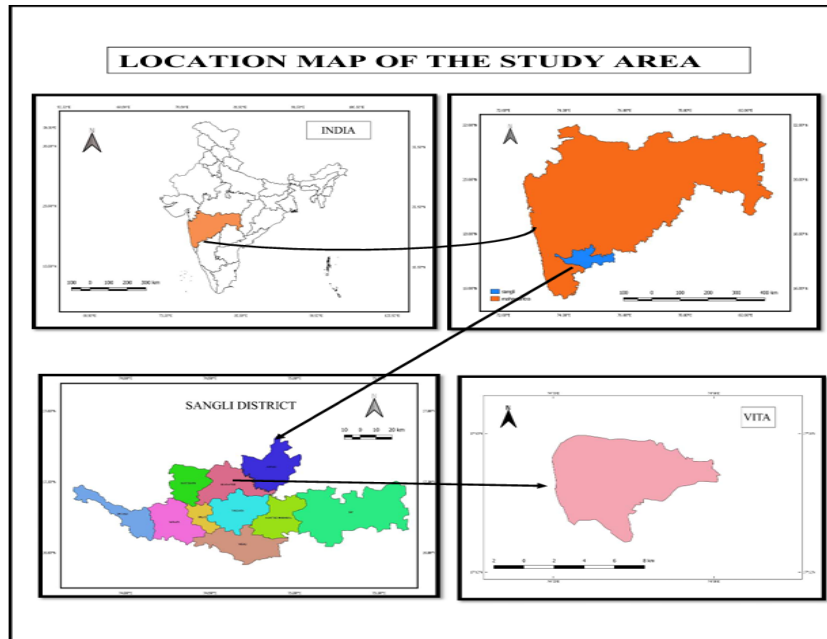
This is an open access journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International](https://creativecommons.org/licenses/by-nc-sa/4.0/) Public License, which allows others to remix, tweak, and build upon the work noncommercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Address for correspondence:

Nilesh Ramchandra Mandle, Assistant Professor, Balwant College Vita

How to cite this article:

N R Mandle, D A Janawade. (2025). Urbanization and Traffic Congestion: A Case Study of Vita City. *Journal of Research & Development*, 17(9), 150-153



Methodology

1. **Survey:** Traffic density recorded at major chowks and roads.
2. **Vehicle Count Method:** Counting vehicles during peak and non-peak hours.
3. **GIS Mapping:** Using QGIS/ArcGIS to identify traffic hotspots.
4. **Interviews & Questionnaires:** Collecting opinions of traders, residents, and drivers.
5. **Secondary Data:** Data from Municipal Council, RTO, and Police Department.

Geographical Causes of Congestion

Natural Factors:

- Flat terrain forces all traffic on a single level.
- Krishna River and agricultural lands restrict road expansion.

Human-made Factors:

1. Rapid population growth in the last two decades.
2. Increase in two-wheelers and four-wheelers.
3. Narrow roads in old settlements (Gandhi Chowk, Market area).
4. Lack of parking facilities, especially near markets.
5. Central location of the bus stand adds to congestion.
6. Pressure from schools and colleges during peak hours.
7. Heavy vehicles passing through city roads (Karad–Tasgaon route).
8. Lack of traffic signals, CCTV monitoring, pedestrian paths.

GIS-based Analysis:

- Hotspots: Gandhi Chowk, Shivaji Chowk, Bus Stand, Vegetable Market.
- Heavy traffic: Karad and Tasgaon roads.
- Medium traffic: Khanapur and Mayani roads.

Impacts of Traffic Congestion

Social:

- Increased travel time for citizens.
- Higher risk of accidents.
- Difficulties for school children and senior citizens.

Economic:

- Wastage of fuel.
- Delay in commercial activities.
- Increased vehicle maintenance costs.

Environmental:

- Air pollution (CO₂, CO, NO_x).
- Noise pollution (horns, engines).
- Urban Heat Island effect.

Suggested Solutions

1. Road widening in congested chowks and market areas.
2. Construction of bypass roads to divert heavy vehicles.
3. Installation of signals, CCTV, and traffic control systems.
4. Development of dedicated parking grounds/multi-level parking.
5. Strengthening public transport – e-buses, mini-bus services.
6. Creating pedestrian and cycle paths.
7. Increasing number of traffic police with stricter enforcement.
8. Staggered school and college timings.
9. Public awareness campaigns.
10. GIS and AI-based real-time traffic mapping and planning.

GIS and AI-based Analysis

GIS: Mapped roads and hotspots using QGIS/ArcGIS. Integrated vehicle count, parking, and accident data. Hotspot analysis highlighted congestion-prone areas. Spatial overlay linked congestion with commercial, educational, and market zones. Temporal analysis showed peak-hour variations.

AI: Machine learning models predicted future vehicle loads. Computer vision analysed CCTV footage to classify vehicles. AI-based traffic simulation models suggested signal optimization, smart parking, and need for improved public transport.

Photo



Conclusion

The study reveals that narrow roads, disorganized chowks, unregulated parking, insufficient public transport, and growing population are the main causes of congestion in Vita city. Gandhi Chowk, Shivaji Chowk, Vegetable Market, Bus Stand, Karad, Tasgaon, and Mayani roads are identified as major congestion points.

Traffic congestion results in fuel wastage, increased pollution, health issues, and economic loss due to delays in trade and transportation. GIS and AI technologies have proven effective in identifying problem areas and suggesting efficient planning measures.

Sustainable traffic management in Vita requires road expansion, bypass development, smart traffic signals, improved parking systems, and strong public transport. With active citizen participation, policy-level initiatives, and modern technology, congestion in Vita can be significantly reduced, paving the way for sustainable urban development.

References

1. Government of India (2016). Urban Transport Policy. Ministry of Housing and Urban Affairs, New Delhi.
2. Indian Roads Congress (IRC) (2017). Guidelines on Traffic Management in Urban Areas. New Delhi.
3. Maitra, B. (2019). Urban Transport Challenges in India: Issues and Policies. Journal of Transport Geography, Vol. 75, pp. 83–92.
4. Nagarkar, V. & Patil, P. (2021). GIS-Based Analysis of Traffic Congestion in Small Towns of Maharashtra. Indian Journal of Geography and Environment, Vol. 45(2), pp. 115–128.
5. Google Maps & GIS Data (2023). Vita City Road Network and Traffic Flow Analysis.
6. Kulkarni, A. (2017). Sustainable Urban Transport in Maharashtra: A Case Study Approach. Economic and Political Weekly, 52(31), pp. 45–52.
7. भोसले, एस. डी. (2018). शहरी वाहतूक नियोजन व समस्या. पुणे: विद्या प्रकाशन.
8. देशमुख, आर. आर. (2020). भारतातील वाहतूक कोडीचे भौगोलिक विश्लेषण. नागपूर: आधुनिक पब्लिकेशन्स.