

# **Nagpur Urban Problem Severity Index (NUPSI)**

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**Abstract:** *Urban areas in developing countries face multiple interconnected daily-life problems including traffic congestion, air pollution, water scarcity, and inefficient solid waste management. However, municipal authorities often lack a unified framework to compare these diverse problems across different geographic zones. This paper introduces the Nagpur Life Quality Analytics System (NLQAS) and its core metric – the Nagpur Urban Problem Severity Index (NUPSI) – a composite index that integrates four measurable indicators: traffic congestion score, air pollution index, water issue score, and garbage complaint frequency.*

**Keywords:** Noise Pollution, NLQAS, Data Analytics, Visualization, Python, Smart City, NUPSI

## **I. INTRODUCTION**

Rapid urbanization in Indian cities has intensified everyday challenges for residents. Nagpur, the winter capital of Maharashtra and a leading Smart City mission participant, exemplifies this phenomenon. Citizens routinely encounter traffic jams on corridors like Wardha Road and Sitabuldi, elevated air pollution – especially during winter due to vehicular emissions and coal transport from the Chandrapur belt – irregular water supply in peri-urban areas such as Hingna, and delayed garbage collection in old city zones like Mahal.

## **II. METHODOLOGY**

The study follows a systematic data analysis process using Python to extract and interpret practical steps:

Steps:

Data Collection: pollution For each zone, four indicators were collected (simulated dataset for proof-of-concept; real data from NMC/CPCB can replace later.

Data Cleaning: Remove duplicates, handle missing values, and format datasets.

Data Analysis: Use Python libraries (Pandas, NumPy) for statistical and comparative analysis.

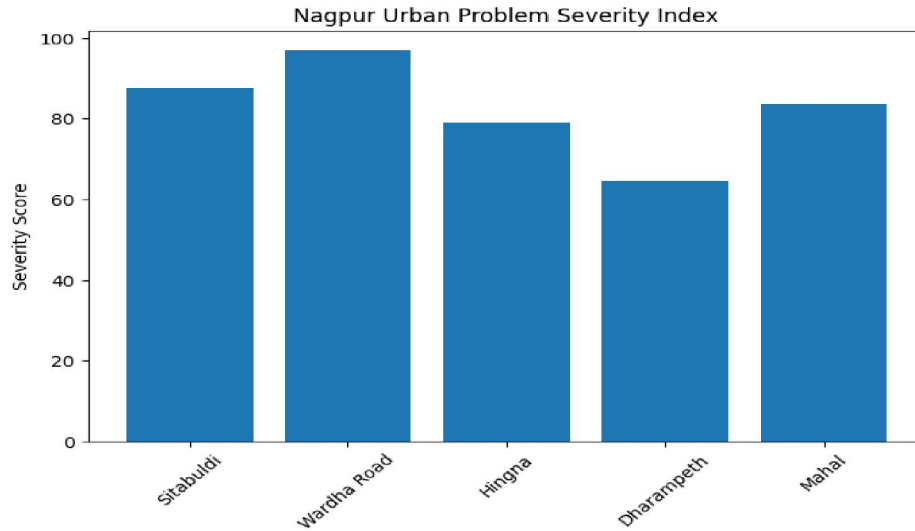
Visualization: Create graphs and dashboards using Matplotlib, Seaborn, and Plotly.

Interpretation: Derive insights and summarize results to support data-driven conclusions.



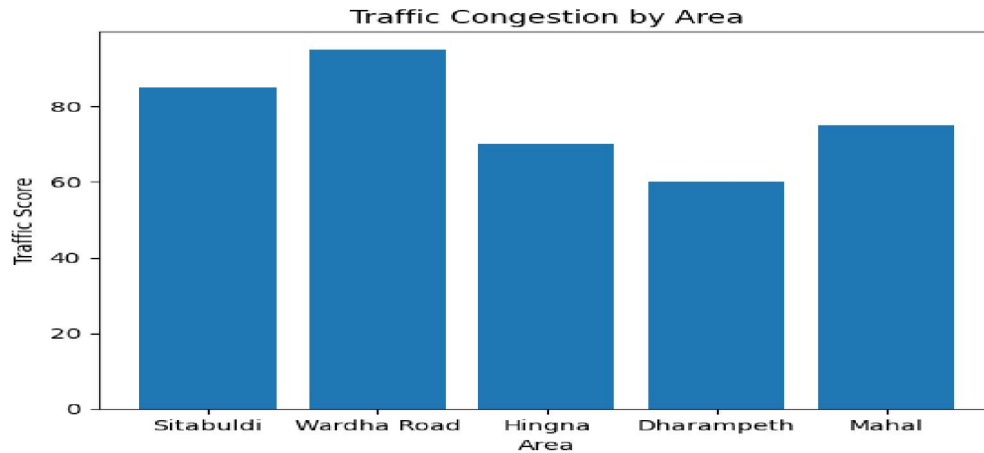
**III. RESULTS AND DISCUSSION**

*The analysis provided several useful insights into NUPSI.*



**Fig. 1 Nagpur Urban Problem Severity Index**

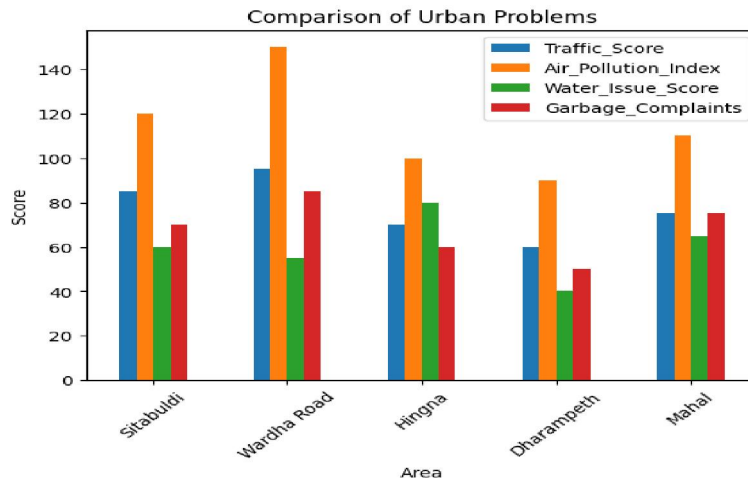
To visually rank the five zones (Sitabuldi, Wardha Road, Hingna, Dharampeth, Mahal) based on their composite Nagpur Urban Problem Severity Index (NUPSI) score.



**Fig. 2. Traffic Congestion by Area**

This chart shows that commercial areas have traffic congestion by area.





**Fig 3. Comparison of urban Problem**

#### IV. CONCLUSION

This study developed the **Nagpur Life Quality Analytics System (NLQAS)**, a data-driven framework for identifying, quantifying, and prioritizing everyday urban problems in Nagpur Division. The core contribution is the **Nagpur Urban Problem Severity Index (NUPSI)** – a weighted composite index integrating four measurable indicators: traffic congestion, air pollution, water scarcity, and garbage management efficiency.

#### V. ACKNOWLEDGMENT

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