

# The Impact of Urbanization on Traffic Congestion: A Case Study of Jabalpur city

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**Abstract** - Urbanization is a global phenomenon transforming cities and their transportation systems. With rapid urban growth comes increased vehicular traffic, often leading to congestion and associated challenges. This research paper presents a case study of Jabalpur City in India to assess the impact of urbanization on traffic congestion and explore potential mitigation strategies. The study begins with a comprehensive literature review to establish the theoretical framework and identify key factors contributing to urban traffic congestion. Drawing upon existing research, the paper outlines the various dimensions of urbanization, including population growth, economic development, and infrastructure expansion, and their implications for traffic congestion. Using a mixed-methods approach, the research employs both quantitative and qualitative analyses to assess the current state of traffic congestion in Jabalpur City.

The research contributes to the understanding of urban traffic congestion dynamics in the context of rapid urbanization, offering valuable insights for urban planners, policymakers, and transportation authorities in Jabalpur City and similar urban centers facing similar challenges. Ultimately, the study aims to inform evidence-based strategies for sustainable urban mobility and enhance the quality of life for residents in Jabalpur City.

**Key Words:** Urbanization, Traffic congestion, Smart city, transportation.

## 1. INTRODUCTION

Urbanization is a defining feature of the modern era, with more than half of the world's population now residing in cities. This rapid urban growth brings about numerous benefits, including economic opportunities, improved access to services, and cultural vibrancy. However, it also presents significant challenges, particularly in the realm of transportation. One of the most pressing issues associated with urbanization is traffic congestion, which has become a pervasive problem in many cities worldwide, including those in India. This research paper aims to assess the impact of urbanization on traffic congestion in Jabalpur City and explore potential strategies to address this pressing issue.

## 1.1 AIM

The focus of the study is analyzing the impact of urbanization on traffic congestion.

## 2. Urbanization in India

Urbanization is an index of transformation from traditional rural economies to modern industrial one. It is progressive concentration (Davis, 1965) of population in urban unit. Quantification of urbanization is very difficult. It is a long term process. Kingsley Davis has explained urbanization as process (Davis, 1962) of switch from spread out pattern of human settlements to one of concentration in urban centers. It is a finite process--- a cycle through which a nation pass as they evolve from agrarian to industrial society (Davis and Golden, 1954). He has mentioned three stages in the process of urbanization. Stage one is the initial stage characterized by rural traditional society with predominance in agriculture and dispersed pattern of settlements. Stage two refers to acceleration stage where basic restructuring of the economy and investments in social overhead capitals including transportation, communication take place.

The number of total population has increased from 23.84 crores in 1901 to 102.7 crores in 2001 whereas number of population residing in urban areas has increased from 2.58 crores in 1901 to 28.53 crore in 2001. India's urban population constitutes a sizeable proportion of world's urban population. This can be well corroborated form the fact that every 12th city dweller of the world and every 7th of the developing countries is from India.

Urban population increased from 26 million in 1901 to 62 million in 1951- an increase of only 36 million in 50 years. But the absolute increase during the next three decades was of the order of 94 million during 1951-81. This indicates that programmes of industrialization did make an impact in terms of population absorption in urban areas, though its impact was very discernible. During 1981-91, urban population in absolute terms reached the figure of 285 million accounting for 27.8 per cent of total population.

**Table -1:** Population of India by Residence (1901-2001)

Census years	Number of Urban agglomeration/town	Total population	Urban population	Rural
1901	1827	238396327	25851873	212544454
1911	1825	252093390	25941633	226151757
1921	1949	251321213	28086167	223235046
1931	2072	278977238	33455989	245521249
1941	2250	318660580	44153297	274507283
1951	2843	361088090	62443709	298644381
1961	2363	439234771	78936603	360298168
1971	2590	598159652	109113977	489045675
1981	3378	683329097	159462547	523866550
1991	3768	844324222	217177625	627146597
2001	5161	1027015247	285354954	741660293

Source: Census Report, Govt. of India, 1901-2001

### 2.1 EFFECT OF URBANIZATION ON TRANSPORTATION

There are 300 million cars, trucks and buses worldwide. There will be heavy traffic jams at major junctions during peak hours. Traffic jams lead to excessive wastage of petroleum products leading to fuel problems. During rush season, vehicles are parked and overloaded, hence the chances of accidents are higher. Combustion of petroleum products and diesel increases carbon dioxide which contributes to global warming, air pollution and noise pollution, besides carbon dioxide, carbon monoxide which is emitted by automobiles. Noise pollution affects both hearing and non-hearing organs. Auditory effects include fatigue and deafness in humans. On-auditory effects include interference with movement, communication, irritation, loss of working capacity, and psycho-physical disorders. While Mumbai still has the best urban transport system and city buses are reasonably available in Chennai, Ahmedabad and Pune, the transport picture in all Indian cities is grim. One reason we are stuck in this mess is that when planning city expansion, we still follow the Western concept of travel time and distance as determinants of the location of activities. This has led to the division of cities into zoning, which requires more travel. Also, our citizens are unable to pay the financial fare to use the public transportation system due to low income levels and affordability. Therefore, all city bus services suffer such large annual losses that they cannot expand or maintain the fleet to meet the needs of the city.



Fig -1: Impact of urbanization on transportation.

### 3. STUDY AREA:-JABALPUR M.P.

Jabalpur, a significant city in the central Indian state of Madhya Pradesh, has undergone substantial urbanization over the past few years. With its rich history, educational institutions, and industrial growth, Jabalpur offers a fascinating case study for analyzing the impacts and processes of urbanization in a mid-sized Indian city. This investigation delves into the various aspects of urbanization in Jabalpur, such as population shifts, infrastructure improvements, economic growth, social changes, and environmental challenges. Jabalpur boasts a rich historical heritage, having served as a significant hub during the reigns of various dynasties, including the Kalchuris, Gondwana, and Marathas.

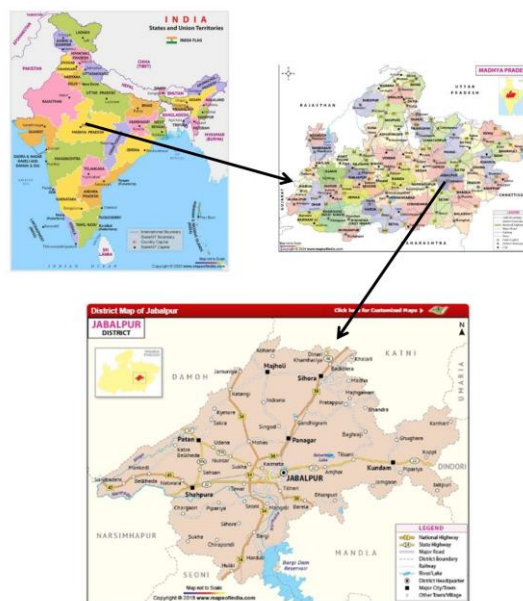


Fig -2: Location map of the study area Jabalpur city (Source: <http://www.mapsofindia.com>)



### 3.1 Causes of Traffic Congestion Due to Urbanization

#### Population Growth

Urbanization in Jabalpur is characterized by substantial population growth. As per the 2011 Census of India, Jabalpur's population surpassed 1.26 million, representing a considerable rise from prior years. This growth can be attributed to both natural increase and migration from rural areas and smaller towns, where individuals seek improved employment prospects and living standards.

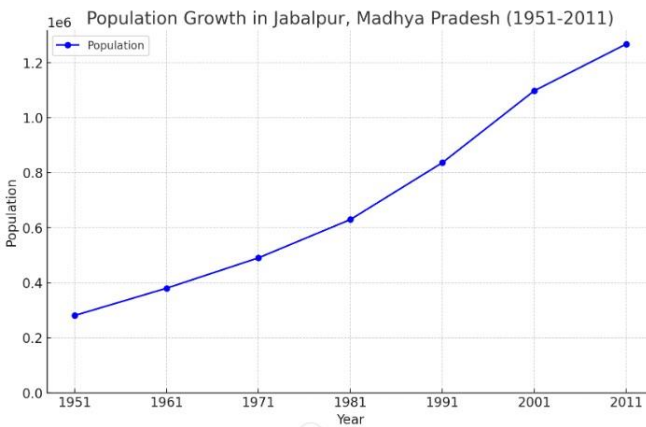


Fig -3: population growth in Jabalpur (M.P.), from 1951 to 2011

#### Increased Vehicle Ownership

Urbanization typically boosts economic growth, resulting in job creation and higher income levels for the population. In Jabalpur, like in numerous other urbanizing areas, the growth of industries, services, and commerce has enhanced the standard of living. As people have more disposable income, they are able to afford vehicles, leading to a rise in vehicle ownership.

As the number of vehicle owners grows, so does the traffic congestion on the roads, resulting in extended commute times and heightened stress levels.

## जबलपुर फ्रंट पेज

दैनिक भास्कर

**कर्मचंद चौक: साँप-सीढ़ी के खेल जैसा है यहाँ का ट्रैफिक, राहगीर और व्यापारी दोनों परेशान**

सबसे व्यस्त चौराहे पर सबह से रात तक बने रहते हैं जाम के हालात, सुधार के लिए नहीं हो रहे कोई प्रयास

**बढ़ता व्यापारिक क्षेत्र, फिर भी लगातार जो जाम रहने अन्देखी**

**पार्किंग और पब्लिक टॉयलेट सबसे बड़ी समस्या**

शहर के सबसे व्यस्त चौराहों में से एक बन्देबाग चौक यहाँ से गुजरने वाले लोगों के लिए मुश्किल बन गया है। कर्मचंद चौक की व्यस्तता बढ़ती जा रही है। यहाँ के ट्रैफिक सिग्नल में 10 से 15 मिनट का जाम रहता है। यहाँ के ट्रैफिक सिग्नल में 10 से 15 मिनट का जाम रहता है। यहाँ के ट्रैफिक सिग्नल में 10 से 15 मिनट का जाम रहता है।

कर्मचंद चौक का ट्रैफिक जाम रहने लगा है। यहाँ के ट्रैफिक सिग्नल में 10 से 15 मिनट का जाम रहता है। यहाँ के ट्रैफिक सिग्नल में 10 से 15 मिनट का जाम रहता है। यहाँ के ट्रैफिक सिग्नल में 10 से 15 मिनट का जाम रहता है।

पार्किंग और पब्लिक टॉयलेट सबसे बड़ी समस्या है। यहाँ के ट्रैफिक सिग्नल में 10 से 15 मिनट का जाम रहता है। यहाँ के ट्रैफिक सिग्नल में 10 से 15 मिनट का जाम रहता है। यहाँ के ट्रैफिक सिग्नल में 10 से 15 मिनट का जाम रहता है।

**जहाँ से निकलना चाहा वहीं मिली वाहनों की लम्बी कतार**

**घमापुर चौक पर लगा जाम बन्देबाग चौक पर भी समस्या से परेशान होते रहे लोग**

प्रतिनिधि, जबलपुर शहर की सड़कों पर जाम लगाना अब कोई नई बात नहीं रह गई है। ऐसा ही कुछ बुधवार की दोपहर उस वक़्त हुआ जब घमापुर चौक पर चायों और वाहनों की लम्बी कतारें लग गईं। इस दौरान जहाँ से भी लोगों ने निकलना चाहा, वहीं पर उन्हें धीमे धीमे वाहन नजर आए। इस दौरान उनका आक्रोश तब और बढ़ गया जब घंटों तक यहाँ ट्रैफिक पुलिस का अमला ही नहीं आया। इसके साथ ही बन्देबाग चौक पर भी बार-बार जाम लगने से यहाँ से निकलने वाले लोग परेशान होते रहे।

**मुख्य निराह लेफिन् ट्रैफिक सिग्नल बंद - इस संबंध में क्षेत्रीयजन राकेश पट्टाचार्य, अट्रुल खलोक, विजय पटेल एवं राधेकाल सोनीय आदि ने बताया कि घमापुर चौक शहर का एक मुख्य निराह है। यहाँ से लोग दिनभर अपने-अपने कारोबारों के लिए आते हैं। यहाँ से गुजरने वाले लोगों की संख्या में भी बढ़ी संख्या में यहाँ से गुजरते हैं। इसी वीच यहाँ लगा ट्रैफिक सिग्नल भी फिखले कई दिनों से बंद है। यही वजह है कि रोजाना लोग जब यहाँ से गुजरते हैं तो उनके वाहनों को रोकने वाला कोई नहीं होता। बुधवार की दोपहर करीब 2 बजे भी ऐसा ही हुआ और जाम लगने की समस्या सामने आई।**

**रफूलों की धुँडी खेने पर अधिक समस्या**

घमापुर चौक के आसपास रहने वाले लोगों का आरोप है कि रोजाना तो यहाँ पर वाहनों का भारी दबाव रहता ही है, लेकिन फिखले दिनों फूल खलुने के बाद से ट्रैफिक सिग्नल बंद होने से यहाँ से गुजरने वाले और इसलिए यहाँ पर दोपहर के समय जाम लगने के हालात अधिक सामने आ रहे हैं। उनके अनुसार जाम के संबंध में कई बार ट्रैफिक थाना घमापुर को भी सूचना दी गई, लेकिन कभी भी यहाँ जिम्मेदार पहुँचते नहीं हैं और इसी के चलते यह इलाका भयावह जाम के दर्द से कराह रहा है।

**बन्देबाग चौक पर भी लगना रह जाम**

इसी तरह बन्देबाग चौक पर भी दिनभर जाम लगने की समस्या सामने आती रही। ऐसा इसलिए हुआ क्योंकि बन्देबाग चौक पर थोड़ी सी जाम में टैंटर संबंधी कार्य पूरा नहीं हो सका है। बताया जाता है कि दमोहनका रूट पर भारी वाहनों का प्रवेश रोकने के लिए सुबह से ही ट्रैफिक पुलिस का अमला यहाँ तैनात रहा। इस दौरान बसों, ट्रकों एवं अन्य बड़े वाहनों को दमोहनका की बजाय दिनदयाल चौक की ओर से निकलने के लिए कहा गया, लेकिन बन्देबाग चौक से गुजरने वाले चारपिंथा वाहनों को रोकना पड़ा जिससे यहाँ पर जाम के हालात बनते रहे। पी-2

An increased quantity of vehicles on the road leads to enhanced air pollution, which may result in significant health consequences for the inhabitants of urban areas.

### CONCLUSION

Urbanization presents both opportunities and challenges, with traffic congestion being a significant issue that impacts the economic, environmental, and social aspects of urban life. To tackle this problem, a comprehensive approach is necessary that includes investments in public transportation, infrastructure development, improved urban planning, and effective policy measures. By implementing these strategies, cities can reduce the negative consequences of traffic congestion and promote sustainable urban development.

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