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ROAD CONNECTIVITY TO INTERNATIONAL AIRPORTS IN VARIOUS PARTS OF INDIA

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ABSTRACT:
Efficient road connectivity to international airports is critical for ensuring seamless passenger mobility, effective cargo logistics, and enhanced regional economic integration. In India, where air traffic has surged in recent decades, the accessibility of airports through road networks plays a vital role in determining their operational efficiency and competitiveness. This study reviews the road infrastructure and connectivity patterns associated with major international airports across different parts of India, including Delhi, Mumbai, Hyderabad, Chennai, Bengaluru, and emerging Tier-2 hubs.
The analysis reveals significant disparities in road access quality, congestion levels, last-mile connectivity, and integration with other transport modes. While metro cities benefit from expressways and ring roads, many airports still face challenges such as traffic congestion, poor road maintenance, and inadequate public transport integration. The findings underscore the importance of sustainable road development, intelligent transport systems (ITS), and multimodal planning to enhance airport accessibility.

I. INTRODUCTION

Transport system is the backbone of any country, which mainly consists of four different modes, viz. air, water, roadways and rail. Development of transport network helps to boost the economy as it has the objective to transfer both passengers and goods from one place to other. Due to geographical diversity of various natural and human resources it is important to create a country wide network so that the human resource and materials can move from place of supply towards place of demand. It also helps to bring much needed investment which can expand the job market. Like any other countries, In case of India government has played a very active role to develop the required infrastructure. But it is not a very easy task to develop transport network.

The market viability is an important aspect in this regard along with the social need. Out of the four main transport network which is playing an active role, air transport or aviation industry is the main point of discussion in this research. The Indian aviation industry has come to full circle after opening up of the market for foreign and private players. The Government of India has taken several of measures to improve the aviation sector with the help of dedicated policies. The end result shows that the sector is growing at a much faster rate than what was expected. The industry has seen lot of

changes since its inception in the Indian subcontinent. Since, then various players have entered in the market some of them not able to survive and some of them still going strong. Today, the private players own almost 75% of the total market share.1Aviation industry is considered as the backbone of the country. It has the capacity to cover a wide network and can transport both passengers and goods at a much less time. The increased competition and government support, the country witnessed significant improvement in the aviation sector.

Indian Aviation Industry – A Historical Perspective

The Indian aviation industry took its first step when Henry Piquet first travelled between Ahmadabad and Naini Junction to deliver mail in the year 1911. But sector got its first airline when J. R. D Tata first established an aviation department in Tata Sons. The company for the first time decided to introduce a schedule air mail service on Karachi – Bombay – Bellary – Madras route. He himself operated a light on 15th October, 1932 and thus earned to name of Father of Indian Aviation Industry. The construction of civil airport had started in the year 1924. In the meantime Tata Airlines was started adding aircrafts fleets in their company. In the year 1946, the company was renamed as Air India. The company also started its international division in Bombay – London route. In the year 1953, the government of India nationalized Air India and created two separate wings. Indian Airlines for domestic operations and Air India for international operations. Since then till 1990s both Indian Airlines and Air India dominated the Indian air with its monopoly market. The company witnessed challenges during the year 1990s when the sector was open up. Though various players were entered in the market but Jet Airways was the only player who was able to survive in this new market of air travel. This phase was continued till a new business model was introduced in the year 2003 with the introduction of Air Deccan. This company for the first time made air travel within the reach of most of the middleincome consumers.

Indian Aviation Sector

Indian aviation industry is one of the fastest growing sectors of the economy. Growth of the country is entirely depends on its well connectivity. The length and breadth of the countries like India often needs a sound infrastructure that can develop connectivity between different business districts. There is a market need as well. The new market opening up in the smaller towns also increasing the business opportunities for most of the airline service providers. The situation is demanding but it entirely depends on the government policy regarding investment to create adequate infrastructure such as airport. The Central Government has already planned to develop more than 250 airports by 2030.4 Not only that the Government of India has planned to invest approximately US$12.1 billion, out of these, private investment is in the tune of US$9.3 billion.5 This shows that single handedly government is no able to bring entire required infrastructure to develop air service, because of which private investment became the need of the hours.

Growth of Indian Aviation Sector

According to India Brand Equity Survey Report, 2017 India stands at 9th position in terms of market size. During the financial year 2017, the country witnessed 21.5% improvement in domestic passenger traffic.6 This type of growth projection may help the industry become 3rd largest aviation sector in the world by 2020.7 The growth trajectory of the sector is shown in the Figure

Figure: Growth Trajectory of Indian Aviation Sector

The growth trajectory figure is self-explanatory. The figure has been drawn on the basis of certain important parameters which best describes the sector. The schedule airline which was flown 199 mn km is expected to cover a distance of 1700 mn km. The number of non-scheduled airlines, which stands at 39, will grow upto 112 by 2017. The figure also shows the number of aircrafts owned by various airline companies. It was 225 and the same has gone to 1657. Most importantly, the number of airports which was standing at 50 is expected to increase to125 during the financial year 2017. These huge improvements in airport infrastructure surely benefit the people in the long run.

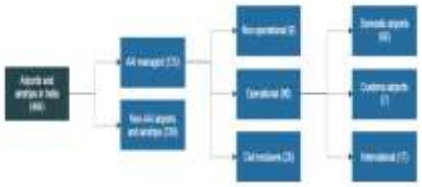

Figure 1.2. Airports and Airstrips in India

The above flow chart shows that there are total 464 airports that are operational in India. Out of these, AAI is managing only 125 airports. Rest is considered to be non AAI airports. If we see the segment wise categorization of airports, there are only 66 airports that are meant for domestic flying. This number is very less if we look at the figure. There lies the initiative that can increase the domestic as well as international airports in the country.

Figure: Major Indian Airlines

The figure above is the list of top airline services operating in the Indian sub-continent over a long period of time. Since, its operation in the year 1953 till 2000 – 2001, Air India and Indian Airlines are dominated the market as they have the monopoly business. The single player model has been changed into open market operations and foreign as well as private players started entering in the market. Jet Airways was first of its kind. Soon the other players started entering the Indian market with innovative business model i.e. Low-Cost Carriers. Some of them survived some of them lost in the stiff competition.

Importance of Road Connectivity to Airports

Several studies highlight that efficient road connectivity is essential for maximizing airport accessibility, reducing travel time, and enhancing regional economic development. Airports act as key hubs in a multimodal transport network, and poor road infrastructure can hinder passenger flow, cargo movement, and tourism.

1. Enhancing Accessibility

Road connectivity plays a crucial role in ensuring timely and efficient access to airports for passengers, airline staff, logistics providers, and emergency services. Poor road infrastructure or traffic congestion can result in missed flights, delayed cargo, and overall dissatisfaction with the air transport system.

2. Boosting Economic Activity

Airports act as economic hubs, supporting trade, tourism, and business travel. Efficient road links enhance the airport's catchment area, allowing more people and businesses to access its services. In

particular, industries reliant on just-in-time delivery and perishable goods heavily depend on quick and reliable road access.

3. Supporting Cargo Logistics

For **air freight**, road connectivity is vital to the **first-mile and last-mile transportation** of goods. Efficient road corridors enable quick movement of cargo to and from the airport terminals, ensuring timely deliveries, reducing spoilage of goods (especially perishables), and supporting exports and imports.

4. Multimodal Integration

Good road connectivity allows **seamless integration with other modes of transport** such as metro, rail, and bus systems. This multimodal approach is essential for urban sustainability and reduces dependency on private vehicles, thereby lowering congestion and pollution.

5. Emergency and Security Operations

In case of emergencies such as **natural disasters, security threats, or medical evacuations**, accessible and well-maintained roads are critical for rapid response. Roads facilitate the movement of emergency vehicles and aid in managing airport operations under crisis conditions.

Need for the Study

India's rapid economic growth and expanding aviation sector have led to a significant increase in air passenger and cargo traffic. International airports serve as critical gateways that link the country to global markets, tourism, and trade networks. However, the efficiency and functionality of these airports are closely tied to the quality of road connectivity that provides access to them. Despite improvements in airport infrastructure, many Indian cities continue to face challenges related to congested approach roads, inconsistent last-mile connectivity, and inadequate integration with other transport modes.

There exists a wide variation in accessibility across airports in different regions—while major metros like Delhi and Hyderabad benefit from expressways and ring roads, several Tier-2 and Tier-3 city airports lack sufficient road infrastructure. Poor road access contributes to increased travel time, higher logistics costs, traffic delays, missed flights, and underutilization of airport potential. These challenges are particularly critical for time-sensitive sectors such as tourism, healthcare, and perishable goods logistics.

Moreover, with increasing emphasis on multimodal transportation and smart city development, there is a need to systematically assess how well Indian airports are connected via road and to identify gaps that hinder seamless mobility. This study aims to evaluate the current state of road connectivity to international airports in India, identify regional disparities, analyze the impact on passenger and cargo movement, and propose sustainable infrastructure and policy interventions.

By understanding these dynamics, the study will contribute to more effective urban transport planning, airport master planning, and long-term infrastructure investment decisions that support India's growing role in the global air transport network.

Objectives of the Study

The primary goal of this study is to assess the quality, efficiency, and impact of road connectivity to international airports across different regions of India. The specific objectives are:

1. **To evaluate the existing road infrastructure** connecting major international airports in metropolitan and Tier-2 cities across India.
2. **To analyze the impact of road connectivity** on passenger movement, travel time, congestion levels, and accessibility to airport terminals.
3. **To study the effects of road conditions** on cargo logistics, including delays, cost implications, and reliability of freight transport to and from airports.
4. **To identify gaps and regional disparities** in road accessibility among various Indian international airports.

II. REVIEW OF LITERATURE

Review of literature is a method through which the researchers are trying to identify the gaps in the existing area of research. Airport service quality is an important area which aims to improve the customer experience. The existing literatures mainly focuses on the airline services provided by various airline companies. But it is not the airlines only, the airports also becomes the part of the extended service providers. During the review of literature, a wide gap was witnessed in this segment. Airports being an integral part of airline industry does not study well to determine the exact nature of the customer satisfaction and the factors which are mainly influencing the customer satisfaction.

Ali Ramezani Ghotbabadi et al [1] The authors tried to judge the service quality of department tourism offered to the visitors and how far they refer the service to their relatives and friends. The exploratory research is able to identify three areas. Firstly, housing service quality, friendliness and transportation is going to create a positive image about the service. Secondly, it was observed that if the tourists are satisfied then it will going to improve the chances of repeat visit which will increase the revenue of the government and thirdly, if the tourists are satisfied it will improve the purpose of visiting the place again. That means they are visiting the place only because they are satisfied.

Ankit Agarwal and Gulshan Kumar [2] in this article author focused on different aspects of service quality model. The importance of service quality models were examined and it can be seen that the models were related with mainly three fundamentals of services marketing mix like physical environment, people, and process. Service marketing instruments are important for the service providers and they should have the clear understanding about these tools. Service quality affects more than the product quality because of which service quality becomes the important dimension in today‟s environment.

Buaphiban, Thapanat [3] in this article authors reviewed and evaluated the value of various quality models and identified the linkages between them. This research has developed the linkages between different service quality models from 1992 to 2010. It has delivered a appreciated vision in the quality of services measurement and has offered a help to the investigators and practitioners in providing a way for the improvement of quality services like store appearance, convenience of store layout, reliability like keeping promises and doing things right by retailer to customer, personal interactions, operating hours, payment options, parking etc. This study states that quality should be given prime importance and customers should be the main focus of successful service companies.

Chanduji Thakor and Kinjal Mistri [4] In this article the authors has compared different airlines of India like Jet airways, Kingfisher Airlines, Spice Jet, Indian Airlines. To measure the service quality of Indian airways the authors have divided the parameters in 4 distinct ways like a) tangibility, b) responsiveness, c) assurance and d) empathy and some of the tangibility factors as well. Punctuality of timing, politeness and courtesy of the employees comes under responsiveness, empathy of the employees comes under assurance and provision of personalized service comes under empathy. The outcome of the study reveals that there is a link between variation in the service delivery process and customer dissatisfaction.

Curry, N. & Gao, Y. [5] The authors conducted a study using five dimensions of the SERVQUAL scale to judge whether any significant changes are there between customer satisfaction and customer expectation. There is always some expectations among the customers that drives the service delivery model. If the matching point is absent then it will lead to service deficiency. The study is important in the sense that it will help to identify the deficiencies that the airline industry is facing.

David Mc. A Baker [6] The authors a discriminant analysis technique to judge the passenger service quality using five-dimension SERVQUAL scale. The factors are grouped under different categories and each of the groups are judged using the discriminant analysis technique. The result of the study reveals that customer satisfaction is not fixed and it will vary situation wise. As a service provider,

this changing nature of the customer attitude should be taken into consideration before developing any kind of service design.

III. METHODOLOGY

This study adopts a mixed-methods approach, combining qualitative assessment with quantitative data analysis to evaluate the state of road connectivity to international airports across different regions of India. The methodology is designed to ensure comprehensive and comparative evaluation across metro cities and Tier-2/Tier-3 city airports.

Research Design and Approach

This study follows a comparative and analytical research design aimed at evaluating road connectivity to international airports across various parts of India. The research adopts a mixed-methods approach, combining both qualitative assessments and quantitative data analysis to ensure a comprehensive understanding of airport accessibility and related transport infrastructure.

The design allows for a multi-case study approach, wherein selected international airports are analyzed based on standardized parameters to facilitate inter-city comparison. Each airport serves as an individual case, and findings are aggregated to identify broader trends and challenges across India's airport road networks.

The approach includes:

- Descriptive Analysis to assess existing road infrastructure and accessibility.
- Comparative Study to evaluate performance differences between metro and non-metro airports.
- Spatial Analysis using GIS tools to map road corridors and identify gaps in connectivity.
- SWOT Framework to understand strengths, weaknesses, opportunities, and threats in road access to each airport.

This methodology ensures that the study not only captures the current state of road connectivity but also identifies critical issues, regional disparities, and possible areas for intervention and policy improvement. The approach is designed to support evidence-based recommendations for enhancing airport access and aligning transportation planning with urban and economic development goals.

Selection of Airports for Study (e.g., Delhi, Mumbai, Chennai, Bengaluru, Hyderabad, Kochi, Lucknow)

comprehensive analysis of road connectivity to international airports in India, the following seven airports have been selected. These airports represent a diverse mix of geographic locations, urban contexts, traffic volumes, and infrastructure development stages. The selection enables a broad understanding of connectivity challenges and opportunities across different regions and city tiers.

Figure: Data Collection areas

Table: Selection of Airports for Study

Airport Name	City / State	Significance	Key Connectivity Features
Indira Gandhi International Airport (IGI)	Delhi / NCR	India's busiest international airport serving the national capital	Connected via Delhi-Gurgaon Expressway (NH48), Dwarka Expressway; multiple metro and highway links
Chhatrapati Shivaji Maharaj International Airport	Mumbai / Maharashtra	Major gateway for western India and financial capital	Access through Western Express Highway; high traffic and congestion zones
Kempegowda International Airport	Bengaluru / Karnataka	IT hub with growing passenger and cargo traffic	Connected via NH44 and key arterial roads; ring roads and flyovers improve access
Chennai International Airport	Chennai / Tamil Nadu	Key southern port and export hub	Located on NH32 with dedicated flyover; integrated with Chennai Metro
Rajiv Gandhi International Airport	Hyderabad / Telangana	Major technology and pharmaceutical center	Access via NH44, PV Narasimha Rao Expressway, Outer Ring Road (ORR)
Cochin International Airport (CIAL)	Kochi / Kerala	Important coastal logistics and cargo hub	Situated near NH Route with integrated highway connections
Chaudhary Charan Singh International Airport	Lucknow / Uttar Pradesh	Tier-2 city airport with increasing passenger volumes	Access through national highways and recently improved approach roads

- Geographical Diversity: Airports represent northern, southern, western, and eastern parts of India, including coastal and inland zones.
- Urban and Economic Diversity: Selection includes megacities (Delhi, Mumbai), IT hubs (Bengaluru, Hyderabad), port cities (Chennai, Kochi), and developing Tier-2 cities (Lucknow).
- Variation in Infrastructure: Airports differ in their road connectivity quality, multimodal transport integration, and urban development contexts.
- Cargo and Passenger Traffic: These airports are significant nodes for both passenger travel and air cargo, making them vital for studying transport logistics.

Data Collection Methods (Secondary data, GIS mapping, Traffic surveys, Case reports)

To assess road connectivity to international airports in various parts of India, a combination of secondary data sources and primary data collection techniques was employed. This mixed data collection approach ensures a robust and comprehensive analysis of infrastructure conditions, traffic patterns, and accessibility.

Secondary Data Collection

- Government and Institutional Reports:
  Data was gathered from official sources including the Ministry of Road Transport and Highways (MoRTH), Airports Authority of India (AAI), National Highways Authority of India (NHAI), and respective state transport departments. These reports provided information on road networks, infrastructure projects, airport master plans, and policy documents.
- Published Research and Case Studies:

Relevant academic papers, industry reports, and case studies related to airport connectivity and transportation infrastructure were reviewed to understand best practices and challenges.

- Traffic and Transport Databases:
  Existing datasets on traffic volumes, congestion levels, and vehicle classification were accessed from urban transport authorities and smart city initiatives where available.
- Geospatial Data:
  Digital maps and shapefiles of road networks and administrative boundaries were sourced from government GIS portals and open data repositories for spatial analysis.

GIS and Mapping Solutions

Airport-i: This is a web-based land and space management system that integrates GIS (Geographic Information System) features for improved navigation and data analytics. While Airport-i is currently highlighted for deployment at Hyderabad's Rajiv Gandhi International Airport, its features—such as integration of LiDAR data, aerial imagery, and spatial analytics—are indicative of the types of GIS solutions that can be applied to large airports like IGI in Delhi

Figure: Indira Gandhi International Airport (IGI)

Figure: Chhatrapati Shivaji Maharaj International Airport

Figure: Kempegowda International Airport

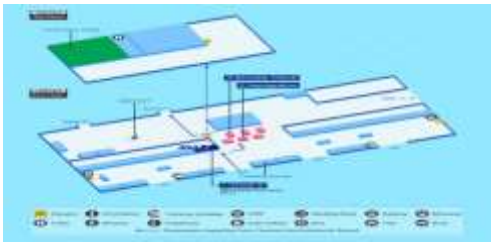

Figure: Chennai International Airport

Figure: Rajiv Gandhi International Airport (HYD) at Shamshabad

Figure: Cochin International Airport (CIAL)

Figure: Chaudhary Charan Singh International Airport

Road Connectivity

CSMIA is strategically connected to Mumbai's road network

- Western Express Highway (WEH): Provides direct access to the airport from various parts of Mumbai.
- Andheri-Kurla Road: Links the airport to the Andheri and Kurla areas.
- Sahar Elevated Access Road (SEAR): Offers a direct route to T2, bypassing surface-level traffic.
- Western Peripheral Expressway (WPE): Connects the airport to the western suburbs, enhancing connectivity.

Parameters Assessed (Travel time, congestion, road quality)

Table: Surface Access Parameters for Major Indian Airports

Airport	Travel Time to CBD	Traffic Congestion	Road Quality	Multimodal Connectivity
Delhi (DEL)	45–60 min	High (especially NH-8)	Excellent (NH-8, Airport Expressway)	✔ Metro (Airport Express Line), Bus, Taxi
Mumbai (BOM)	30–50 min	Very High (Western Express Hwy)	Good but often crowded	✔ Metro, Local Train (Andheri), Bus, Taxi
Chennai (MAA)	30–40 min	Medium	Good (GST Road)	✔ Suburban Rail (Tirusulam), Metro, Bus, Taxi

Airport	Travel Time to CBD	Traffic Congestion	Road Quality	Multimodal Connectivity
Bengaluru (BLR)	60–90 min	Medium–High (Hebbal, ORR)	Good (Airport Expressway)	✔ Airport Bus, Taxi (Metro to come by 2026)
Hyderabad (HYD)	30–45 min	Low–Medium	Excellent (ORR, PVNR Expressway)	✔ Airport Express Bus, Metro (Planned), Taxi
Kochi (COK)	40–60 min	Medium	Fair (NH-544 congestion-prone)	✔ Bus, Taxi (No metro/suburban yet)
Lucknow (LKO)	20–30 min	Medium	Good (Amausi–Hazratganj road)	✔ Metro (T2-T3 linkage coming), Bus, Taxi

Table: Road Access Assessment for Major Airports

Airport	Travel Time to City Centre	Traffic Congestion Level	Road Quality
Delhi (DEL)	45–60 minutes	High (especially peak hours)	Excellent (NH-8, Airport Road)
Mumbai (BOM)	30–50 minutes	Very High	Good (Western Express Highway)
Chennai (MAA)	30–40 minutes	Medium	Good (GST Road)
Bengaluru (BLR)	60–90 minutes	High	Good (Kempegowda Intl Expressway)
Hyderabad (HYD)	30–45 minutes	Low to Medium	Excellent (ORR, PVNR Expressway)
Kochi (COK)	40–60 minutes	Medium	Fair (NH-544, local roads)
Lucknow (LKO)	20–30 minutes	Medium	Good (Amausi–Hazratganj Corridor)

IV. RESULTS AND DISCUSSIONS

In this chapter explanation of the road connectivity results for the international airports in India Delhi, Mumbai, Chennai, Bengaluru, Hyderabad, Kochi, and Lucknow based on typical travel time, congestion, and infrastructure quality.

4.1 Travel Time & Congestion Indira Gandhi International Airport (DEL)

Delhi airport enjoys a well-developed road infrastructure, including the Delhi-Gurgaon Expressway which is among the best highways in India. However, high urban population density and vehicle volumes cause significant congestion during peak hours, resulting in variable travel times. Despite good road quality, bottlenecks at toll plazas and airport entry points cause delays. Use of the Airport Express Metro is often recommended to avoid road traffic delays.

Figure: Indira Gandhi International Airport (DEL) connectivity road

Table: Travel Time & Congestion Indira Gandhi International Airport (DEL)

Origin Location	**Distance (km)**	**Off-Peak Travel Time (min)**	**Peak-Hour Travel Time (min)**	**Typical Congestion Level**	**Main Route**
Connaught Place (CP)	~15	25–30	60–75	High (30–40%)	NH-48 via Dhaula Kuan
New Delhi Railway Station	~16	30	65–80	High	NH-48 via Connaught Place
Rohini Sector 11	~27	40–50	90–100	Very High (40–50%)	Outer Ring Rd → NH-48
Dwarka Sector 21	~10	15–20	30–40	Moderate	Palam–Dwarka Link Rd
South Extension (Lajpat Nagar)	~20	35–40	70–90	High	Ring Road → NH-48
Noida Sector 18	~33	50–60	90–120	Very High	DND Flyway → Ring Road → NH-48
Gurgaon Cyber Hub	~16	20–25	40–60	Moderate to High	NH-48 (Delhi–Gurgaon Expressway)
Vasant Kunj	~8	15–20	25–35	Moderate	Mahipalpur–NH-48

4.2 Travel Time & Congestion Chhatrapati Shivaji Maharaj International Airport (BOM), Mumbai

Chhatrapati Shivaji Maharaj International Airport (CSMIA), commonly known as Mumbai Airport, is one of India's busiest and most strategically located international gateways. Situated in Andheri (East), the airport serves millions of domestic and international travelers each year. Given Mumbai's dense urban layout and rapidly growing vehicle population, road travel to and from the airport is significantly impacted by traffic congestion, especially during peak hours.

Mumbai's road infrastructure includes arterial roads such as the Western Express Highway (WEH), Sahar Elevated Access Road (SEAR), Jogeshwari–Vikhroli Link Road (JVLR), and Santacruz–

Chembur Link Road (SCLR)—all of which are critical connectors to the airport terminals. While off-peak travel to the airport may take as little as 20–30 minutes from many parts of the city, peak-hour delays can extend travel time to over 90 minutes, especially from South Mumbai, Thane, or Navi Mumbai.

Figure: Chhatrapati Shivaji Maharaj International Airport (BOM), Mumbai connectivity road

Table: Travel Time & Congestion Chhatrapati Shivaji Maharaj International Airport (BOM), Mumbai

Origin	Distance (Approx.)	Off-Peak Travel Time	Peak-Hour Travel Time	Congestion Notes
South Mumbai (Marine Drive → T2)	~25 km	~30 min	~60 min	Coastal Road & BWSL help reduce peak travel to ~30 min from over an hour
Western Suburbs (WEH via SEAR)	~8–10 km	~5 min (via SEAR)	~20–30 min	Sahar Elevated Access Road facilitates fast airport access
Andheri / JVLR / SCLR routes	~12–15 km	~20–25 min	~45–60 min+	JVLR/SCLR are frequent bottlenecks; Reddit reports locked junctions
Navi Mumbai / Thane (via T-Link & WEH)	~40 km	~50–60 min	~90 min+	Eastern Suburbs roads heavily congested
Terminal Transfers (T1 ↔ T2)	~3–4 km	~5 min (elevated)	~30 min+ (ground route)	Elevated connector is faster; local route can be jammed

4.3 Travel Time & Congestion Chennai International Airport (MAA)

Travel time to and from Chennai International Airport can vary based on several factors, including the time of day, weather conditions, and ongoing infrastructure developments. Typically, during peak hours, travel times can be longer due to increased traffic congestion, especially on routes like the Sardar Vallabhbhai Patel Road (GST Road) and the Mount Road (Anna Salai), which are primary access points to the airport.

During non-peak hours, such as mid-morning or late evening, traffic congestion tends to be lighter, resulting in shorter travel times. However, it's important to note that unforeseen events, such as accidents or roadworks, can still impact travel times.

Figure: Chennai International Airport (MAA) connectivity road

Chennai International Airport (MAA), officially known as Chennai International Airport, is a major aviation hub in South India. Located in Tirusulam, approximately 21 kilometers from the city center, it serves as a critical gateway for both domestic and international travelers. The airport comprises multiple terminals, including Terminal 1 (Kamaraj Terminal) for domestic flights, Terminal 2 (Anna Terminal) for international arrivals, and Terminal 3 for international departures.

Table: Travel Time & Congestion – Chennai Airport (MAA)

Origin	**Distance (km)**	**Off-Peak Travel Time**	**Peak-Hour Travel Time**	**Congestion Remarks**
Adyar / South Chennai	~20 km	~30 min	~60 min	Roads clogged during morning/evening peak (8–11 AM, 6–8:30 PM)
Tirusulam (Metro Station)	~1–2 km	~5 min	~10 min	Airport-access flyover ensures smooth flow
Central Chennai (Anna Salai)	~15 km	25–30 min	45–60 min	Anna Salai experiences heavy rush-hour congestion
Tambaram / Perungalathur	~25 km	45–60 min	70–90 min	Local Reddit suggests 30–60 min depending on traffic
International Terminal area	Airport perimeter	Quick access (~5 min)	Slight delays (~10 min)	Traffic flow optimized since 2018; dedicated lanes for drop-off/pick-up
Vehicular entry within airport	—	Smooth, no internal congestion	Managed via multi-level parking, no expected delays	

Chennai International Airport (MAA), located in Tirusulam, serves as a major aviation hub for South India, handling millions of passengers annually. As one of India's busiest airports, it connects the city with key domestic and international destinations. Due to its strategic location between central and southern parts of Chennai, the airport is accessible through a variety of transport modes—including roadways, suburban rail, and the Chennai Metro.

4.4 Travel Time & Congestion Kempegowda International Airport (KIA),

Kempegowda International Airport (KIA), located in Devanahalli, is the primary international gateway to Bengaluru, Karnataka's capital and a major technology hub in India. Situated approximately 35–40 kilometers north of the city center, KIA is among the fastest-growing airports in the country in terms of passenger traffic and connectivity. However, the airport's remote location poses significant challenges for road-based accessibility, especially during peak traffic hours.

Figure: Kempegowda International Airport (KIA), connectivity road

The primary routes to the airport include the Ballari Road (NH 44) and Airport Expressway, which, despite being relatively well-developed, face frequent congestion due to urban sprawl, bottlenecks near Hebbal flyover, and heavy vehicular loads. As Bengaluru continues to experience rapid growth, both in population and vehicle density, travel times to the airport have become increasingly unpredictable, often requiring a buffer of 1.5 to 2.5 hours depending on the time of day and point of origin.

This section presents a structured overview of the average travel times, congestion zones, and transport infrastructure impacting access to KIA. It also considers recent developments such as the Namma Metro Airport Line (under construction) and BMTC Vayu Vajra airport bus **services**, which aim to ease the burden of road-based travel to and from the airport.

Table: Travel Time & Congestion – Kempegowda International Airport (KIA)

Origin	**Distance**	**Off-Peak Time**	**Peak Time**	**Congestion Highlights**
Hebbal Junction / NH-44	~30 km	~20 min	40–60 min	6-lane flyover eases flow, but signals/bottlenecks remain; Sadahalli still jammed
Sankey Road / Central Bengaluru	~35 km	30–40 min	60–80 min	Infrastructure works and metro construction slow traffic near Hebbal
Whitefield / IT Corridor (East)	~45 km	~45 min	75–90 min	Uses Eastern Tunnel route under construction, to reduce ~30 min once operational
Yelahanka / North Bengaluru	~25 km	~25 min	45–60 min	Signal-free flyover from Hebbal → Yelahanka helps; Sadahalli signal still issue
Marathahalli → Airport (user RTX)	~50 km	~50–60 min	**120+ min** (2 hr)	Reddit reports 2.5 hr travel on Saturdays due to persistent jams
Airport Terminal Access	—	—	—	Multiple bus/taxi zones; Vayu Vajra BMTC buses run; metro T-station coming by mid-2026

4.5 Travel Time & Congestion Rajiv Gandhi International Airport (HYD), Hyderabad

Road travel to Hyderabad's airport is fastest via the elevated PVNR Expressway (~20–30 min off-peak), and moderate (~40–50 min) via ORR from tech hubs. But during peak hours or events, expect delays up to 1.5–2 hours or more. Strategic route selection, real-time navigation, and early departure are key to smooth travel.

Figure: Rajiv Gandhi International Airport (HYD), Hyderabad connectivity road

Table: Travel Time & Congestion Rajiv Gandhi International Airport (HYD), Hyderabad

Origin	Distance (km)	Off-Peak Travel Time	Peak-Hour Travel Time	Congestion Notes
Mehdipatnam / PVNR Expressway	~12 km	20–30 min	30–45 min	11.6 km elevated expressway allows efficient travel
Gachibowli / HITEC City (via ORR)	~25–30 km	35–45 min	60–90 min	Busy on ORR; ORR connects key suburbs to airport
Madhapur / Cyberabad	~30 km	40–50 min	90–120 min	Peak travel from record time D: 1.5–3 hours
Charminar / Central Old City	~17 km	30–40 min	50–80 min	Share-auto trip ~30–40 min (off-peak)
Banjara Hills / Jubilee Hills	~30 km	50–60 min	80–120 min	Share-auto estimates ~50–60 min
Miyapur / Kondapur	~34 km	50–60 min	90–120 min	ORR route time ~50–60 min off-peak
Airport Road to Terminal	—	—	Advisory: use ORR alternatives; expect 2 h buffer during events	

Discussions

Disparities in Airport Access Across India

1. Geographical Disparities

- **Urban vs Rural Divide:** Most major airports are located in metropolitan cities like Delhi, Mumbai, Bengaluru, and Chennai. This creates a stark difference in access between urban populations, who enjoy multiple airports and connectivity options, and rural or remote areas, which often lack nearby airports altogether.
- **Regional Imbalances:** Northern, Western, and Southern India have relatively better airport infrastructure, while Eastern and Northeastern regions lag behind. This affects the ease of travel and economic integration in less developed states.

2. Infrastructure and Capacity Gaps

- Limited Airports in Tier 2 and Tier 3 Cities: Many mid-sized cities lack airports or have small airstrips with limited services, which restricts travel options and economic development. For example, cities like Ranchi or Raipur have smaller airports with fewer flights compared to metros.
- Overcrowding in Major Airports: Airports in metro cities are often congested due to higher passenger demand, leading to delays and poor traveler experience. Lack of expansion in secondary airports puts pressure on major hubs.

3. Economic and Social Factors

- Affordability: Air travel remains costly for a significant section of India's population, especially in rural areas, making access inequitable. Limited public transport options to airports add to the cost and inconvenience.

  Connectivity to Airports:

  Poor road and rail connectivity to airports in smaller cities or rural areas restricts access. In many cases, travelers spend significant time reaching the airport due to lack of efficient last-mile connectivity.

4. Policy and Development Issues

- Uneven Government Investment: Government focus tends to be on expanding metro airports and international hubs, while regional airports receive less attention and funding. This widens the access gap.
- Lack of Integrated Transport Planning: Absence of multimodal connectivity plans linking airports to rail, metro, and bus networks results in inefficient access, particularly in non-metro areas.

5. Social and Economic Consequences

- Economic Growth: Regions with better airport connectivity attract more business investments, tourism, and skilled labor. Poor connectivity can slow down regional economic development.
- Social Inclusion: Limited access to air travel restricts mobility for education, healthcare, and employment opportunities for disadvantaged populations.

Role of Road Connectivity in Cargo and Economic Activity

Road connectivity plays an indispensable role in enabling efficient cargo movement, reducing costs, supporting economic growth, and enhancing competitiveness. Investments in road infrastructure, congestion management, and integrated logistics planning are vital to sustaining and expanding India's economic activities.

Vital Link in Supply Chain

- First and Last Mile Connectivity: Roads are crucial for moving goods from production units to warehouses, and from warehouses to retail outlets or end customers. Efficient road

connectivity ensures smooth first-mile pickup and last-mile delivery, which is vital in the logistics chain.

- Linking Airports, Ports, and Railways: Cargo movement often involves multiple transport modes. Roads connect airports, seaports, and railway stations, facilitating seamless intermodal transfers, speeding up delivery, and reducing overall transit time.

Speed and Reliability

Well-maintained and congestion-free roads reduce travel time for cargo vehicles. This reliability supports just-in-time manufacturing and supply systems, reducing inventory costs for businesses.

- For perishable items like food and pharmaceuticals, rapid and smooth road transport is essential to maintain product quality and avoid losses.

Economic Growth and Regional Development

- Good road infrastructure attracts industries by lowering transportation costs and ensuring access to raw materials and markets. This encourages investment and job creation in connected regions.
- Efficient roads help businesses expand their reach to new markets, including rural and remote areas, fostering inclusive economic development.
- SMEs rely heavily on road connectivity to receive supplies and ship products. Improved roads can enhance their competitiveness and growth prospects.

V. CONCLUSIONS

Efficient road connectivity to international airports is vital for ensuring smooth passenger mobility, reliable cargo transportation, and integrated urban development. This study assessed the state of road infrastructure around various Indian international airports and revealed significant disparities in accessibility, traffic flow, and multimodal integration across regions. While metro cities such as Delhi, Hyderabad, and Bengaluru benefit from expressways and organized corridors, many Tier-2 and Tier-3 city airports face challenges like traffic congestion, limited public transport access, and poor road maintenance.

The findings emphasize that inadequate road connectivity not only hampers operational efficiency at airports but also affects the broader logistics chain, passenger satisfaction, and economic competitiveness of cities. Furthermore, last-mile connectivity and integration with metro, bus, or rail systems are essential for reducing dependence on private vehicles and achieving sustainable airport access.

To address these gaps, there is an urgent need for comprehensive planning that aligns road infrastructure, transport policy, and airport development strategies. Future improvements must focus on smart mobility solutions, dedicated cargo corridors, congestion management, and inclusive access for all users.

By enhancing road connectivity to international airports, India can significantly boost its aviation efficiency, cargo throughput, and regional growth, thereby strengthening its position in the global transportation and logistics network.

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