CHAPTER 131

Study on Access Roads in Select Locations in Western Pune City

Vinay S.[1], Sheshadri Jahagiradar[1], M. S. Akshay[1], Debjit Ghosh[1], Nagarjuna Pilaka[2]

ABSTRACT

Access roads are essential for smoother connectivity, reducing travel time, and cutting down congestion. The Pune Municipal Corporation (PMC) has pinpointed 390 missing or inadequate access road sections that significantly disrupt the city's transportation flow. This research employs a blend of user surveys, on-site observations, and an extensive review of existing studies to comprehensively examine access roads. The literature review reveals a noticeable research gap, as most prior studies have largely focused on highways rather than the access roads that link primary routes to zones like residential neighbourhoods, commercial districts, and industrial areas. This study suggests that road designs should align with IRC standards. Upgrading these roads could bring wide-ranging benefits, from rising property values to stimulating economic growth and improving the daily lives of residents. The study provides guidance for urban planners to make access road development a priority in Pune's infrastructure plan, laying the groundwork for long-term, sustainable urban growth.

Keywords: Access roads; Congestion; Transportation; Indian road congress (IRC) standards; Encroachments.

1.0 Introduction

Road development is crucial for national progress, with construction contributing 12–15% to GDP and road transport adding 3–6%. Pune, a rapidly growing tier-two city, faces severe congestion due to rising population and transport demand. Existing roads are overloaded, prompting the Pune Municipal Corporation (PMC) to identify 390 missing link road projects. Addressing these gaps, particularly in western Pune, through feasibility studies and Indian standards-based solutions can enhance connectivity and reduce traffic. Despite extensive highways, poor infrastructure worsens congestion. Strengthening access roads will improve traffic flow across residential, business, and industrial zones, ensuring a smoother commute.

2.0 Literature Review

This research looks at transport system efficiency, optimizing access road arrangements in construction in order to achieve higher productivity, energy efficiency, and mechanization.

[1]*School of Construction, NICMAR University, Pune, Maharashtra, India*
[2]*Corresponding author; School of Construction, NICMAR University, Pune, Maharashtra, India (E-mail: nagarjuna@nicmar.ac.in)*

DOI: 10.17492/JPI/NICMAR/2507131 *ISBN: 978-93-49790-54-4*

It recommends a sequential construction approach to road building for better efficiency. Delays in road development in developing nations are often due to improper planning, inexperience, and problems related to land acquisition. The solutions included in the case studies are dispute resolution, cash flow management, and urban planning. These case studies include Uganda's payment delays, Egypt's cost overruns, and Nigeria's financial constraints. It offers proposed recommendations for expert hiring, incentives, recurrent site visits, and cutting material wastage for project success. Stakeholder involvement and ownership verification are key in mitigating the land acquisition process.

3.0 Objectives

1. To assess the conditions of access roads through quantitative and qualitative data.
2. To recommend a framework for development of access roads in accordance with Indian standard codes and literatures referred.

4.0 Methods and Materials

In this study, various access road stretches in the Western Pune city were visited and their condition were analysed. Firstly, the parameters for the study were identified. These parameters define the condition of access road. They were further categorized as either a qualitative or quantitative data. The identified parameters were examined by conducting an observatory study for each access road stretch visited. A questionnaire survey enlisting the questions about the condition of access road was conducted to understand the satisfaction level of the residents and home buyers using the access roads. A visual examination checklist was prepared, where each qualitative and quantitative parameter identified were rated on a scale of 5 based on their condition observed for each access road The data collected from various surveys were thoroughly analysed and a detailed framework for the construction and maintenance of access road will be provided with reference to the Indian standard codes and literatures referred.

4.1 Case study: Maruti Chowk to Pan Card club, Baner, Pune

The access road stretch from the Maruti chowk connecting the Pan card club in Baner, Pune, Maharashtra was identified.

4.1.1 Observations

The two lane access road had a carriageway width of 6.1m on both sides with a median 1m separating them. The access road was connecting a four lane main road. The shoulder on one side of the road was in poor condition with lot of vegetation growth and the shoulder on the other side was acquired by the private properties. Illegal vehicle parking causing narrowing of carriage way width. Width of the road was not uniform throughout the stretch. The road stretch

DOI: 10.17492/JPI/NICMAR/2507131 *ISBN: 978-93-49790-54-4*

had a rigid pavement. The road stretch had a low traffic density. Illegal accommodation by the slum dwellers was observed. Because of this there was a discontinuity in the road stretch and the poor road condition. The length of the access road was approximately 250 meters in which approximately 30 – 40 m was encroached by the slum.

Figure 1: Satellite View of Maruti Chowk to Pan Card Club

Source: Google maps

4.1.2 Local interview

An interview involving the local residents and Slum owner was conducted. The response given by the people is given below.

Slum owner: The interviewee, who has been a resident for 20 years, said that there was no road 15 years ago. PMC put in a pipeline and asphalted it in 2009. PMC designated it as a missing link road in 2020, directing slum dwellers to leave. They are against the 20m-wide proposal, preferring 15m. The court case is still on.

Resident in the nearby apartment: The interviewee opines that the road will provide easy access to Pan Card Club, decreasing travel distance from Maruti Chowk to Pan Car Club as well as alleviating congestion on the road that is in use now.

4.2 On field survey

Table 1: On Field Survey

SL. No.	Access Road	Access Road Location	Length of the Road in Meters	Road width in Meters	Number of Buildings connecting the Road	Traffic Volume (vehicles/hr)
1	AR 1 (Hind)	Hinjewadi Medical foundation to Lord Dattatreya temple	241	4.7	7	37
2	AR 2 (Hind)	Terminal one shopping mall to Tata auto systems	499.5	6.4	11	61
3	AR 3 (Wakad)	Wakad flyover road to Surya mother and child care hospital	252.6	7.1	1	28

DOI: 10.17492/JPI/NICMAR/2507131 *ISBN: 978-93-49790-54-4*

4	AR 4 (Wakad)	Mahatma Phule road to Rohan Inspera apartment	144.1	5.9	3	15
5	AR 5 (Wakad)	Mahatma Phule road to Nirmiti Lorelle apartment	307.6	6.2	15	73
6	AR 6 (Bald)	Lakshmi mata mitra mandal towards Balewadi Gaon	150	4.6	3	150
7	AR 7 (Baner)	Baner road to Pan card club road (Tapkir lane)	104	4.57	6	150
8	AR 8 (Baner)	Off Aundh – Baner link road	368	10.3	20	130
9	AR 9 (Baner)	Laxman nagar road	568	8.1	12	98

Source: Compiled by authors

4.2.1 Observations

The average length of the access roads visited was observed to be 293 meters. Most of the access roads had a length between 500 to 600 meters, followed by a length of 300 to 400 meters, 200 to 300 meters, 400 to 500 meters, 500 to 600 meters and 400 to 500 meters. The average width of the access roads visited was observed to be approximately 6 meters with most of the access roads with a width between 4 to 8 meters, followed by 8 to 12 meters. The shoulders weren't found in eight of the access roads. Shoulders existed only in one of the access road on AR 8 (Baner), which was of width 2.5 m. The importance of access roads is indicated by the location and number of buildings connected by the road. It was observed that on an average approximately at least 7 residential or commercial spaces were connected by the access roads. It was observed that the traffic volume on a particular access road stretch depends on the kind of building, purpose of the building and number of buildings connected by the road. The traffic volume ranged between 15 to 150 vehicles per hour. From the data collected it can be noted that on an average 83 vehicles per hour travel on the access roads.

4.3 Visual survey

A checklist was also prepared in addition to qualitative and quantitative analysis to identify important parameters at each access road visited. Parameters present were marked as 'Yes' and parameters not present were marked as 'No.' On presence, a condition-based score was marked on a 5-point scale. Presence of every parameter was given a score of '1,' and absence was marked as '0.' These checklists have a comprehensive appraisal of every access road stretch. Summary of visual survey.

4.4 Home buyers/Residents survey

It aims to assess the condition, safety, and accessibility of access roads by implementing a Google Forms survey conducted among 40 respondents from the Western Pune area.

DOI: 10.17492/JPI/NICMAR/2507131 *ISBN: 978-93-49790-54-4*

Table 2: Quantitative Survey

Sl. No.	Access Road No.	Qualitative Survey	Quantitative Survey	Total
1	AR 1 (Hind)	2	15	17
2	AR 2 (Hind)	4	2	6
3	AR 3 (Wakad)	3	9	12
4	AR 4 (Wakad)	3	17	20
5	AR 5 (Wakad)	4	6	10
6	AR 6 (Bald)	3	12	15
7	AR 7 (Baner)	4	23	27
8	AR 8 (Baner)	4	24	28
9	AR 9 (Baner)	1	21	22

Source: Compiled by authors

4.4.1 Observations

The responses came from a variety of professions, including software engineers, government employees, teachers, students, doctors and civil engineers. Around 55% said the access road width was enough for the smooth flow of traffic, while 45% said it was not enough. About 59% of the respondents were satisfied with drainage conditions of access roads, whereas around 41% were not satisfied with drainage conditions. About 53% of respondents had adequate parking space for parking their vehicles and about 47% of respondents faced difficulty in parking their vehicles due to unauthorized parking. About 50% of the respondents observed all kinds of vehicles using the road, 43% saw only cars and motorcycles, 5% noted light commercial vehicles, and 2% pedestrians.

Out of 40 respondents, 55% of them are not happy with the condition of access road connecting their society and 45% of them are happy with the condition of access road connecting their society. 42% of them feel that government is responsible for the maintenance of access roads, 35% of them feel that local authorities/municipal bodies are responsible for the maintenance of access roads and 23% of them have responded that the society developers are responsible for the maintenance of access roads. About 42% of them have responded that maintenance of the access roads takes place frequently, 25% of the respondents say that maintenance works takes place rarely, 17% of the respondents say that maintenance of the access roads takes place very frequently, 8% of them have responded that they have never seen any maintenance works for their access roads and 8% of the respondents are unaware of any maintenance work happened for their access road.

5.0 Analysis and Interpretation

Based on the total scores obtained in the visual survey, the ranking of access roads is as follows: 1. AR 8 (Baner); 2. AR 7 (Baner); 3. AR 9 (Baner); 4. AR 4 (Wakad); 5. AR 1 (Hind);

DOI: 10.17492/JPI/NICMAR/2507131 *ISBN: 978-93-49790-54-4*

6. AR 6 (Bald); 7. AR 3 (Wakad); 8. AR 5 (Wakad); 9. AR 2 (Hind). Nine access roads inspected received average qualitative score of 3, quantitative score of 14, and 17 in total. Among them, AR 8 (Baner) secured the highest (28) on adequacy of width, drainage, quality of pavements, and visibility of markings; AR 2 (Hind) scored the lowest (6) on the account of poor paving, no lights, and trash. AR 7 (Baner) lacked adequate markings, AR 9 (Baner) had good lighting but poor drainage, and AR 4 (Wakad) had potential for widening but was ruined by poor lighting. While some roads are also mentioned below for poor scores-AR 1 (Hind), AR 6 (Bald), AR 5 (Wakad), and AR 3 (Wakad)-four were meeting IRC standards. however, three were adjacent to the standards and three failed. More than half of the respondents found roads narrow, heavily impacted by illegal parking which constricted width for effective passageways. Seven of them still have streetlights, albeit with efficient lighting. Inadequate lighting was underlined by 80% of respondents as basically needing good improvement according to the National Lighting Code 2010 and IS: 1944-1970. Government intervention, proper town planning with fair compensation, and stakeholder management in the acquisition of land would be required.

6.0 Conclusion

This study investigates the contribution made by accessroadsin the context of urban transport and also the impediments to their development. The following problems regarding the access roads were identified: irregular width, poor pavements, poor drainage systems, unauthorised parking, and encroachment, based on findings from field surveys and interviews, contributing to congestion and hazards. A few roads also did not comply with the standards set forth by the Indian Road Congress (IRC), while disputes over land have also hindered upgradation. Recommendations were also made regarding such issues, including sufficient width, proper drainage, streetlights, medians, and land acquisition dispute resolutions. Their installations could lead to an improvement in Pune's access roads, thereby creating connectivity and mobility. Traffic analysis, safety studies, and financial feasibility studies should be incorporated into the future research works.

References

Aayush, S. (2017). *Village road construction*.

Adigwe, E. R., Obi, A. N., & Umeh, A. C. (2023). Mitigation measures towards projects cost overrun in road infrastructure projects constructed by local firms in Nigeria. *International Journal of Advanced Multidisciplinary Research and Studies, 3*(2), 225–233.

Ajay, P., & Sebastian, M. (2019). Towards reform of land acquisition framework in India. *Economic and Political Weekly, 42*(22), 2083–2090.

DOI: 10.17492/JPI/NICMAR/2507131 *ISBN: 978-93-49790-54-4*

Bureau of Indian Standards. (1970). *IS 1944: Code of practice for lighting of public thoroughfares* (Parts I & II). Bureau of Indian Standards.

Chunho, Y., Hilario, B., & Ludwig, R. (2020). A study on causes of delay in road construction projects across 25 developing countries. *MDPI, 5*(10), 84.

Dhananjaya, S. (2020). Pune traffic congestion: Reality, cause and regulation: A case study. *International Journal of Management, 11*(3), 227–234.

Goran, R., & Jelisavaka, B. (2019). Rural roads: Issues and development. *Journal of Management and Accounting Studies, 4*(4), 70–77.

Harshit, G., Kartik, P., Rohan, N., Shruti, S., Smitha, Y., & Trishula, M. (2019). Claims and settlement in road projects. *Journal of Civil Engineering, Science and Technology, 10*(1), 1–11.

Indian Roads Congress. (2018). *Guidelines for parking spaces in urban areas (IRC SP: 12-2015)*. Indian Roads Congress.

Indian Roads Congress. (2018). *IRC 86: Geometric design standards for urban roads and streets*. Indian Roads Congress.

Joseph, A., Muhwezi, L., & Sammuel, E. (2019). Assessment of the challenges and effects of delays in compulsory land acquisition on the performance of road construction projects in Uganda. *International Journal of Advanced Multidisciplinary Research and Studies, 10*(9), 1409–1426.

Karim, A., Mohammed, A., & Taher, E. (2022). Risk factors causing cost overruns in road networks. *Ain Shams Engineering Journal, 13*(5), 225–233.

Mohammad, A. K., Mohd, A. K., & Vanishya, V. (2024). Urban regeneration of public spaces and pedestrian streets in commercial area: Case of Chandni Chowk at Old Delhi, India. *American Journal of Civil Engineering and Architecture, 12*(3), 44–50.

Paige-Green, P. (2019). Appropriate roads for rural access. *Third Gulf Conference on Road*, 1–10.

Prasad, K. (2024, March 20). New road to link Kothrud to highway by March-end. *The Times of India*.

DOI: 10.17492/JPI/NICMAR/2507131 *ISBN: 978-93-49790-54-4*