Redefining Livability through 15 Minute Neighbourhoods – An Approach to Enhance Quality of Life through Sustainable Mobility

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1 ABSTRACT

Rapid urbanization in India has strained infrastructure, mobility, and public spaces, reducing urban livability. By 2050, over 800 million people are expected to live in Indian cities (Bhagat, 2015), worsening these challenges due to poor planning, outdated design standards, and capacity constraints. Cities like Bengaluru, on their growth trajectory, face severe challenges such as congestion, flooding, inadequate pedestrian infrastructure due to urbanisation imapcting the every day experience of citizens. Traditional top-down master planning prioritizes large-scale infrastructure but often overlooks localized, people-centric needs. A decentralized, neighbourhood-focused approach is essential to create sustainable, inclusive communities where the residents move, eat, play, and feel included.

Using Nallurahalli, a mixed use neighbourhood in Bengaluru as a case study, this research applies a mixed-methods approach, including infrastructure benchmarking, user perception surveys, and mobility audits, to assess quality of life at a neighbourhood level. Findings highlight critical gaps in pedestrian infrastructure, last-mile connectivity, and public space accessibility, reinforcing the need for localized, neighbourhood-scale solutions – a gap effectively addressed through the 15-minute neighbourhood model.

This study highlights the potential of 15-minute neighbourhoods to enhance mobility, reduce private vehicle dependence, and promote environmental sustainability. It offers a replicable, bottom-up planning model tailored to Indian cities, providing actionable strategies for policymakers to implement 15-minute neighbourhoods.

Keywords: Walkability and Accessibility, Sustainable Mobility, Quality of life, Neighbourhood-level Planning, 15-Minute Neighbourhoods

2 INTRODUCTION

2.1 Reimagining Indian Cities – Need for Decentralised Planning

India's urban population is projected to grow by 416 million by 2050, nearly doubling its current size (UN DESA, 2018). Without strategic intervention, this rapid expansion will require strengthened urban planning frameworks to ensure sustainable growth, equitable infrastructure, and enhanced livability (ADB, 2012).

Masterplans play a crucial role in shaping urban development by guiding infrastructure investments, zoning regulations, and long-term city visions. Across India, 52% of statutory towns are expanding without master planning frameworks, leading to gaps in mobility, access to public spaces, and essential services (NIUA, 2021). Even where masterplans exist, their preparation often takes a long time, making it challenging to respond to the immediate needs of growing communities. For instance, Bengaluru, spanning 740 square kilometers with a population of 14 million, currently lacks a masterplan (World Population Review, 2024). Its previous plan expired in 2015, and the 2031 revision remains incomplete. Meanwhile, rapid urban growth has led to flooding, congestion, declining air quality, loss of green cover, and encroachment of public spaces, significantly impacting livability.

Given the scale and pace of urbanization of Indian Cities, there is a need to complement masterplans with decentralized, neighbourhood-level planning that prioritizes local accessibility, walkability, and public space enhancements. While masterplans focus on city-wide infrastructure such as transit corridors and major road networks, neighbourhood-level planning ensures that everyday urban experiences where people live, play, work, and interact are enhanced. This allows citizens to witness and benefit from observable, impactful changes such as walkable streets, improved public spaces, and access to high-quality amenities that promote public ownership and well-being (Yigitcanlar et al., 2015).

The 15-minute neighbourhood model becomes a method to ensure this – it enhances quality of life in neighbourhoods by ensuring the availability, accessibility, and quality of amenities reachable within a 15-minute walk from one's residence (Moreno et al., 2021). Through integrating neighbourhood planning within

broader urban strategies, cities can create livable, resilient, and self-sufficient communities that enhance overall quality of life (Gehl 2010).

2.2 Research Scope and Approach

This study, part of a larger ongoing research initiative, examines the potential of 15-minute neighbourhoods to enhance quality of life in Bengaluru. It explores an implementation framework that includes benchmarking, needs assessment, and intervention strategies, offering a structured approach to operationalizing the concept.

Using place-based insights from Nallurahalli, a Bengaluru neighbourhood, the study demonstrates how 15-minute neighbourhood planning can provide hyperlocal solutions that can improve quality of life. While the concept of 15-minute neighbourhoods has been widely discussed, its practical implementation in highly developed, brownfield cities like Bengaluru remains underexplored.

Existing studies on 15-minute neighbourhoods have primarily focused on greenfield developments and well-planned urban expansions in cities like Paris (Moreno et al., 2021), Melbourne (Victoria State Government, 2015), and Portland. However, their application in densely populated, unplanned, or rapidly urbanizing cities in the Global South is still limited (Yigitcanlar et al., 2015). The challenges of retrofitting built environment, addressing diverse socio-economic conditions, and integrating new mobility solutions such as non-motorized transport (NMT) within existing infrastructure remain a significant challenge.

This study builds on existing research by positioning 15-minute neighbourhood planning as both a theoretical and actionable framework. By bridging the gap between policy vision and on-ground execution, this approach demonstrates how neighbourhood-level planning can be integrated into current planning paradigm.

3 RESEARCH METHODOLOGY

An implementation mechanism has been developed to systematically assess and transform neighbourhoods into vibrant 15-minute neighbourhoods. This process involves neighbourhood selection, baseline assessments, data analysis, and strategic recommendations. The Availability-Accessibility-Quality (AAQ) framework forms the foundation of this approach:

- Availability – Benchmarking of infrastructure and services based on planning standards (NBC, 2016; URDPFI, 2014).

- Accessibility – Evaluation through walkability, cyclability, and lux level surveys to assess ease of movement

- Quality – User perception surveys to gauge infrastructure usability, safety, and satisfaction

This mixed-methods approach has been applied and tested to gather quantitative and qualitative data from Nallurahalli neighbourhood, demonstrating its applicability in real-world urban settings.

Stage	Objective	Methods Used
Neighbourhood Selection	Identify areas with potential for 15-minute neighbourhood transformation	Administrative, transport, environmental, and socio-economic criteria
Baseline Assessment	Understand existing infrastructure and service distribution	GIS mapping, ground-truthing, open-source data validation
Availability Analysis	Determine the presence of essential amenities	Benchmarking against national and global standards on neighbourhood planning
Accessibility Analysis	Assess mobility and ease of movement within the neighbourhood	Walkability, cyclability, and lux level surveys
Quality Assessment	Evaluate user satisfaction and infrastructure usability	User perception surveys, community engagement
Data Analysis	Identify critical gaps and areas for improvement	Comparative analysis of findings
Strategic Recommendations	Develop targeted interventions for walkability, accessibility, and livability	Policy, planning, and project-based solutions

Table 1: Research Framework for 15-Minute Neighbourhood Implementation

3.1 Neighbourhood Selection

The 15-minute neighbourhood concept is built on walkability, with an optimal radius of 1–1.2 km. However, wards in Indian cities, including Bengaluru (3.5–4 km² on average), are significantly larger. To identify potential areas for compact, walkable neighbourhoods, the following criteria were applied:

- Administrative Factors: Consideration of ward boundaries, planning regulations, land use, and cultural/historical context.

- Transport Infrastructure: Proximity to public transit and mobility infrastructure.

- Environmental Factors: Natural boundaries like water bodies, forests to ensure ecological sensitivity.

- Socio-Economic Factors: Inclusion of income diversity, employment hubs, and informal settlements to ensure equitable access.

Nallurahalli, a 1.5 km² mixed-use neighbourhood in Bengaluru, was selected as the study area for its ongoing urban growth, development potential, and strong citizen engagement.

3.2 Availability-Accessibility-Quality Assessment Framework

After identifying and selecting potential neighbourhood, it was imperative to carry out baseline assessments of each before further planning and design. This study conceptualised the 'Availability-Accessibility-Quality' framework which can be used to tangibly identify existing gaps in a neighbourhood.

3.2.1 Availability

First, using insights gathered from literature reviews, a list of amenities critical to day-to-day functioning was identified and benchmarked as the 'must haves' of any neighbourhood (Refer Annex A). This list was built drawing insights from established standards such as National Building Code (NBC), and Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines for India. Furthermore, references to national guidelines like the Indian Road Congress, Model Building Bye-Laws 2016, and Harmonised Guidelines Space Standards for Universal Accessibility in India-2021, along with insights from international examples of neighbourhood planning and 15-minute communities, have enriched the indicators and requirements for developing a 15-minute neighbourhood.

Using this framework, A baseline study benchmarked critical infrastructure and mapped amenities in Nallurahalli using GIS, Google Earth, and ground-truthing to verify accessibility within a 15-minute walk from the neighbourhood's central node.

3.2.2 Accessibility

Accessibility was assessed through multiple methods, including on-ground surveys using GPS tracking to capture walking and cycling routes, footpath conditions, cycle lanes, and pedestrian crossings. Light meters and observational audits evaluated street lighting, signage, and visibility. Photo documentation identified gaps in infrastructure, ensuring a comprehensive analysis of pedestrian and cyclist accessibility.

3.2.3 Quality

During this phase, qualitative information about neighbourhood amenities was collected through door-to-door surveys and online forms. Door-to-door surveys, conducted using mobile tools such as Google Forms and Survey CTO gathered detailed feedback from residents, with geo-tagged data. Simultaneously, online Google Forms distributed via WhatsApp, Resident Welfare Associations, and social media captured responses from a wider audience.

3.3 Neighbourhood Assessment Surveys

To implement the Availability-Accessibility-Quality framework, a series of neighbourhood assessment surveys were conducted to evaluate infrastructure, mobility, and user experience as illustrated in Figure 1. These surveys provided a comprehensive understanding of existing conditions and identified key areas for improvement.

- Validation Survey – Verified infrastructure presence using open-source data and field assessments.

- Infrastructure Assessment Survey – Evaluated the on ground condition and usability of parks, markets, and mobility hubs.

- Walkability Survey – Measured pedestrian safety, accessibility gaps, and network connectivity.

- Cyclability Survey – Assessed cycling conditions, revealing a lack of dedicated infrastructure.

- Lux Level Survey – Identified poorly lit areas impacting nighttime safety and walkability.

- User Perception Survey – Captured resident perspectives on accessibility, quality, and livability.

The study assessed 5 km of roads and 10 key infrastructure points across a 1.5 km² area, ensuring a detailed evaluation of neighbourhood. A systematic stratified sampling approach was used to select 104 respondents, ensuring adequate spatial coverage within the compact study area.The sample is designed to capture diverse socio-economic typologies by alternating respondents between adults and senior citizens of both genders.

To provide a comprehensive, well-rounded analysis, objective infrastructure assessments were combined with citizen perception surveys at key locations, including residential areas, transit hubs (Nallurahalli Metro Station), and public spaces (Nallurahalli Park, Nallurahalli lake, and Inner Circle Municipal Park). This mixed-method approach integrated quantitative infrastructure evaluations with qualitative user insights, offering a holistic understanding of accessibility, mobility, and neighbourhood amenities. Additionally, a city-wide online survey was conducted across Bengaluru to understand citizens' needs and aspirations regarding 15-minute neighbourhoods, gathering 1,640 responses. However, these findings are not included in this study as they do not specifically pertain to Nallurahalli.
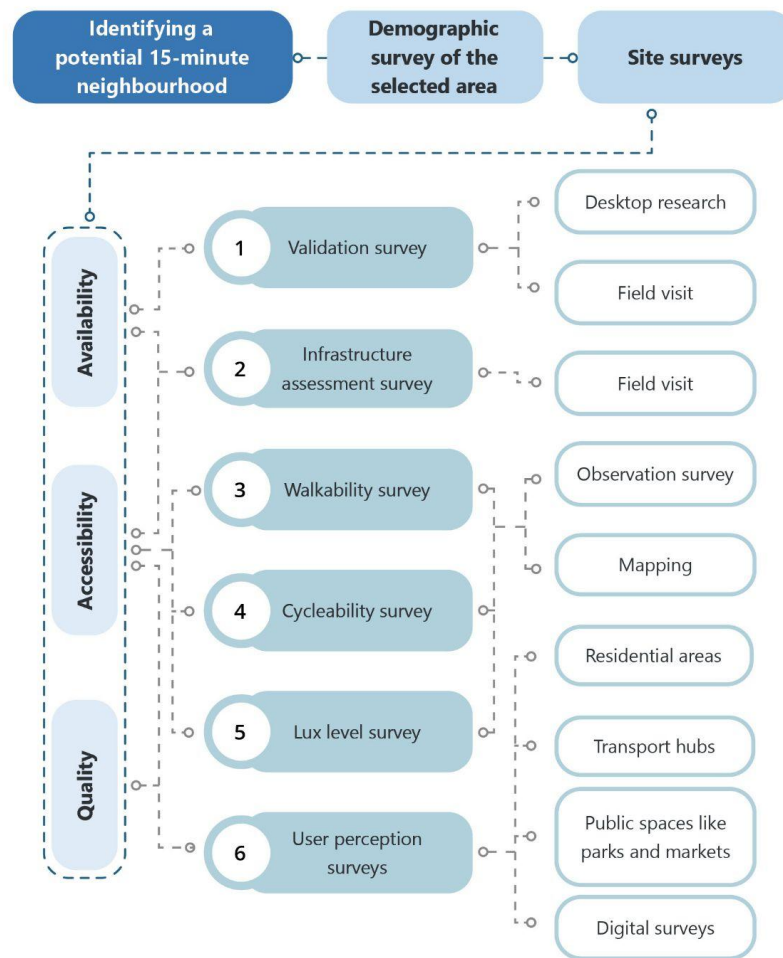

Fig. 1: Types of neighbourhood assessment surveys conducted in Nallurahalli. Source: Jana Urban Space Foundation (2024).

3.4 Indentifying and Analysing Gaps

After Neighbourhood-specific findings for each neighbourhood were obtained by administering the 6 types of neighbourhood assessment surveys following the Availability-Accessibility-Quality framework. Findings from each neighbourhood are collated and critically analysed against the standards identified as per the Availability-Accessibility-Quality framework. This helped identify and analyse neighbourhood-specific gaps.

3.5 Devising Recommendations

After Neighbourhood-specific findings for each neighbourhood were obtained by administering the 6 types of neighbourhood

Based on neighbourhood-specific insights, three key intervention categories were identified:

- Policies – Advocating for decentralized planning, sustainable mobility, and inclusive development

- Plans – Developing neighbourhood-scale spatial planning models to promote compact, walkable neighbourhoods through active citizen participation

- Projects – Implementing targeted solutions such as improved footpaths, last-mile connectivity, and public space revitalization. While plans help define the physical limits of developmental activities in an area, projects serve as critical mechanisms that bring these plans to life.

4 FINDINGS

Based on the research methodology, gaps in mobility infrastructure, public spaces, and social infrastructure were identified and categorized under three themes: 'Move' (Mobility Infrastructure), 'Play' (Public Spaces), and 'Include' (Social Infrastructure). This structured approach ensures a comprehensive analysis of survey data. The findings presented are derived from a sample of 104 respondents in Nallurahalli and are expressed in percentages.

Category	Key Insights
"Move" (Mobility Infrastructure)	Inadequate pedestrian infrastructure, poor last-mile connectivity, and safety concerns hinder accessibility. Strengthening walkability, integrating public transport, and upgrading infrastructure are essential for improving mobility.
"Play" (Public Spaces)	Poor access, lack of wayfinding, and safety concerns limit the usability of public spaces. Enhancing lighting, signage, and footpath quality can increase their accessibility and usage.
"Include" (Social Infrastructure)	Limited availability and accessibility of essential services force residents to travel long distances for daily needs. Strengthening local markets, improving pedestrian infrastructure, and expanding access to healthcare and community spaces can improve liveability.

Table 2: Key findings at a glance

At the neighbourhood level, mobility emerged as the most pressing concern, with 96% of respondents prioritizing it over public spaces and social infrastructure. A notable takeaway was the strong community interest in participatory planning, with 50% preferring direct engagement through Resident Welfare Associations (RWAs) and ward meetings.

4.1 "Move" (Mobility Infrastructure)

Despite the presence of Nallurahalli Metro Station and Whitefield TTMC, reliance on private vehicles remains high, with 70% using them for daily commutes. Public transport adoption remains low (4%), with 86% rating their walking experience as "poor" due to lack of footpaths, unsafe crossings, and inadequate lighting.

- Last-mile connectivity remains a major issue, with 80% rating it "poor."

- Footpaths leading to transit hubs are largely inaccessible, limiting usage

- Lux levels at 17, falling below the 25-40 range recommended by IRC standards, affecting safety

- 49% cited waterlogging as a barrier to mobility

- 69% agreed that improving walkability would enhance their quality of life

4.2 "Play" (Public Spaces)

Public spaces remain underutilized and underappreciated – only 19% of residents actively use them, and 59% were unaware of their presence.

- Satisfaction with available public spaces is low, with only 21% expressing contentment.

- Nallurahalli Lake was the most frequented space, but 33% of users feel unsafe after 6 PM, citing poor lighting.

- Inner Circle Municipal Park sees 92% of users walking, yet only 11% rated footpaths as good.

- 80% of respondents found signage and wayfinding in public spaces inadequate.

4.3 "Include" (Social Infrastructure)

Accessibility to essential services remains a mixed picture. Basic amenities ranked as the third most important factor for a walkable neighbourhood, yet:

- 95% of residents walk for grocery shopping, but 12% travel over 5 km for larger shopping complexes.

- 53% spend under an hour accessing amenities, while 47% spend 2-5 hours.

- 15% travel outside Nallurahalli for entertainment and sports, with 30% traveling over 10 km.

- Despite proximity to hospitals, 65% still travel outside the neighbourhood for healthcare.

- 86% cited poor walking infrastructure as a major barrier to accessing social amenities.

Findings from this study indicate a strong infrastructural gap in locally available amenities and accessibility to them. As per many responses, basic amenities in the neighbourhood – including schools and anganwadis – are reported largely to be inaccessible to people with disabilities. Respondents were also asked whether any 'other' amenities, apart from the ones listed, were missing in their neighbourhood. The 'other' services and amenities listed were "playgrounds", "footpaths for safe walking", and "bus facilities".

Further, findings on 'Move' and 'Play' also align with this discussion on access to the social infrastructure within the neighbourhood. The poor walking experience remarked by 86% respondents, limited access to people with disabilities, and the absence of adequate transport options indicate that inclusive accessibility to amenities and social infrastructures within Nallurahalli, despite their sparse availability, is limited.

5 RECOMMENDATIONS FOR NALLURAHALLI

Recommendations derived from neighbourhood assessments and community engagement, are categorized under three themes: Move- Play- Include. The proposed interventions align with international best practices in urban planning, transport-oriented development, and place-making to ensure long-term impact.

5.1 "Move" (Mobility Infrastructure)

Nallurahalli's mobility landscape faces traffic congestion, poor last-mile connectivity, and limited alternatives to private vehicles. However, its proximity to key transit hubs like Nallurahalli Metro and Whitefield TTMC (bus station) presents a strong opportunity for transformation.

5.1.1 Quick-win projects include:

- Road and junction improvements to create walkable footpaths and dedicated cycling infrastructure.

- Enhancing safety with adequate streetlights, traffic calming measures, and safe pedestrian crossings.

- Improving bus infrastructure with well-designed bus stops offering shaded waiting space, wayfinding, and real-time transit information.

5.1.2 Policy Interventions:

- Feeder loops connecting inner neighbourhoods to metro and bus stations.

- Public Bike Sharing (PBS) zones to encourage cycling and designated parking near transit points

- Sustainable transport incentives such as subsidies for non-motorized mobility

- Mobility technology solutions like real-time transit apps for seamless multi-modal integration

5.2 "Play" (Public Spaces)

A well-designed public realm enhances social interaction and livability, yet Nallurahalli lacks high-quality, accessible public spaces. Enhancing urban design and activating underutilized areas can foster a sense of community and increase walkability.

5.2.1 Public space enhancement:

- Upgrading Nallurahalli Park with universal accessibility features, gender sensitive play areas

- Rejuvenation of Nallurahalli Lake to establish a biodiversity-conscious, inclusive recreational space.

5.2.2   Policy and Community-Based Approaches:

- Installing navigational signage and information boards to improve access and awareness

- Encouraging local businesses, collectives, and corporate partnerships for public space maintenance

- Introducing temporary street closures, pop-up events, and placemaking projects to activate spaces.

5.3 "Include" – Social Infrastructure

Access to markets, community spaces, and essential services is critical to reducing reliance on private vehicles and promoting self-sufficiency. Nallurahalli currently lacks designated markets, organized vending spaces, and universally accessible community infrastructure.

5.3.1   Strengthening Local Economies and Community Infrastructure

- Establishing dedicated spaces for weekly markets to enhance access to local fresh produce

- Developing regulated, pedestrian-friendly vending spaces to support informal livelihoods.

- Building universally accessible schools and spaces to serve a diverse socio-economic demographic.

- Designing inclusive public spaces catering to women, children, elderly, and persons with disabilities.

The strategic transformation of Nallurahalli into a 15-minute neighbourhood requires integrated interventions in mobility, public spaces, and social infrastructure. A multi-pronged approach of combining quick wins, high-impact projects with long-term policy reforms will ensure sustained benefits for all residents. Community participation will be crucial in maintaining and scaling these interventions

6   NEIGHBOURHOOD LEVEL PLANNING AS TOOLS FOR CHANGE

Building on the recommendations for Nallurahalli, two lighthouse projects are currently under construction, driven by collaboration between private sector stakeholders, citizen collectives, and elected representatives. These projects focus on retrofitting pedestrian infrastructure to improve first- and last-mile connectivity and enhancing wayfinding through strategically placed information boards and signage.

However, to transform dense, million-plus cities like Bengaluru, Mumbai, and Delhi, a city-level programme is essential. Scaling up 15-minute neighbourhood planning requires enhanced institutional capacity, strengthened governance mechanisms, and a structured framework to guide implementation. Given the scale and complexity of Indian cities, a systematic, city-wide approach is necessary to ensure replicability and sustained impact.

6.1 The Need for a New Institutional Approach

While Local Area Plans (LAPs) are statutorily recognized in India, their implementation has been limited due to institutional ambiguity, regulatory obstacles, and fragmented governance structures (GRERA, 2022). Cities lack a dedicated institutional mechanism to operationalize neighbourhood-level planning, leading to delays, inconsistent execution, and weak community participation

Conversely, structured institutional setups have proven effective in driving urban transformation. For example, the Smart Cities Mission leveraged Special Purpose Vehicles (SPVs) to streamline decision-making, ensuring targeted project execution (MOHUA, 2019). A similar approach is needed for 15-minute neighbourhood planning, with a dedicated city-level programme, institutional framework, cross-sectoral coordination, and public engagement.

6.2 Pathways for Implementation in Other Urban Areas

Using findings from this study, this section proposes the 15-Minute Neighbourhood Programme as a scalable model – a possible implementation pathway to help develop 15-minute neighbourhoods in Bengaluru and other Indian cities. The following nine-step framework provides a structured roadmap for execution-

6.2.1   Roll-out

The city formally announces the 15-Minute Neighbourhood Programme, aligning it with existing city level master plans to ensure coherence. The masterplan serves as a strategic framework, integrating the programme into its broader vision while decentralised actions are implemented at neighbourhood levels.

Local governments play a central role in coordination, decision-making, and obtaining necessary approvals to operationalise the programme.

6.2.2 Budgetary Allocations

A sustainable financial model is essential for funding capital, operational, and maintenance expenditures. The city must integrate the programme into existing urban development, mobility, smart cities, and public infrastructure budgets, leveraging state and union government funding.

6.2.3 Institutional Setup

The 15-minute neighbourhoods programme may be anchored by a steering committee formed by members of the urban local body, that acts as an apex body for the programme. This stage entails the formation of a 15-Minute Neighbourhoods Programme Cell within the urban local body that anchors the implementation of the programme in a city, and is entrusted with the budgetary allocations made in the preceding stage.

This cell must consist of urban planners and designers, architects, engineers, subject-matter experts, and community members. Additionally, ward committees and city mayor may be identified as local partners of the Cell that can steer implementation at the neighbourhood level. This Programme Cell would be responsible for carrying out policy analyses and providing inputs on the design of the programme itself, and its operationalisation. The other responsibilities of this Cell can include goal-setting, defining stakeholders' specific roles and conducting relevant research to identify potential 15-minute neighbourhoods in the city. The Cell must also actively work towards building capacities through training and knowledge dissemination of the programme, using guidelines for identifying and developing 15-minute neighbourhoods.

6.2.4 Neighbourhood Selection

The Programme Cell, along with relevant government stakeholders and partners from the ward committee, will select neighbourhoods identified as potential high-impact 15-minute neighbourhoods for development. The neighbourhoods must be selected based on administrative factors, transport infrastructure availability, environmental factors and socio-economic factors, as outlined in detail through this research.

6.2.5 Community Engagement

A neighbourhood-specific implementation body is formed under the Programme Cell to lead citizen consultations, participatory workshops, and data collection. This ensures planning reflects local aspirations and needs. Partnerships with Community-Based Organizations (CBOs) can further enhance community ownership and sustainability. This implementation body will also facilitate cultural planning, branding, and communication strategies to foster encourage more involvement.

6.2.6 Analysis

This phase entails a detailed analysis of the neighbourhood's infrastructure and amenities, using the Availability-Accessibility-Quality framework. This analysis must be based strictly on findings obtained through the detailed neighbourhood assessment surveys outlined in this research. First, a baseline study of the neighbourhood must outline the amenities available within a 15-minute walking distance from the neighbourhood. Then, data on access to the amenities identified within the neighbourhood must be obtained. This will help gather insights into the accessibility of these infrastructures, and whether or not one can access these on foot/using cycles. Parallely, inputs from citizens obtained through neighbourhood-level community engagements capturing their spatial perceptions and needs must also be incorporated to inform the analyses drawn. Additionally, these inputs can be used further for identifying neighbourhood-specific high-impact interventions that can enhance the residents' quality of life.

6.2.7 Design and Implementation

After critically analysing a neighbourhood for its availability, accessibility and quality of amenities, with inputs gained from public engagements, specific areas of intervention must be identified by the 15-Minute Neighbourhood Cell. The Cell must also develop specific proposals for the selected neighbourhood that must follow the Policies, Plans, and Projects approach outlined in this research, to develop high-impact proposals that can be implemented within short, medium, and long term. Lastly, by deploying an additional loop of

feedback through community engagements, the steering committee must open the proposal to public discussion, incorporating all major suggestions received from citizens.

6.2.8 Neighbourhood-level budgetary allocations

After identifying and finalising a proposal, a detailed and end-to-end cost estimate is required to be drawn by the 15-Minute Neighbourhood Cell for the implementation process. This budget will then be reviewed internally and will be critical in the allocation and disbursement of funds to the ward committee, and then to the concerned implementation body upon approval.

6.2.9 Impact Assessment and Maintenance

The 15-Minute Neighbourhood Programme Cell must conduct impact assessment studies for the implemented interventions at strategic intervals of time, based on predefined metrics. These metrics may include user-safety, climatic impacts, gendered perspectives, and impacts to public health, to name a few. The findings from this assessment must then be presented to the steering committee to review internally, and to the urban local body to advocate upscaling the 15-minute neighbourhood model to other neighbourhoods across the city.

Additionally, a strong maintenance plan and clear ownership structures must be established to ensure the long-term success and continuity of interventions. This includes engaging neighbourhood implementation group (refer step 5) in the upkeep and management of public spaces.

7 LIMITATIONS

While this study provides valuable insights into the applicability of 15-minute neighbourhoods in Bengaluru, certain limitations must be acknowledged. The sample size for Nallurahalli (104 respondents) may appear small in isolation; however, it is part of a broader study covering four neighbourhoods, with approximately 500 total survey responses (primary survey) and 1600 responses through a city level online survey. To ensure a comprehensive understanding, the research integrates multiple data sources, including objective surveys(walkability, cyclability, and lux-level surveys), infrastructure assessments, and targeted surveys at residential areas, key transit hubs and public spaces.

Additionally, while the study presents a structured pathway for implementing 15-minute neighbourhoods, scaling this approach across cities requires further exploration of institutional frameworks, governance mechanisms, and financial models. Further work is needed to establish long-term governance structures and policy pathways to integrate 15-minute neighbourhood planning into existing statutory planning frameworks.

8 CONCLUSION

The transformation of Nallurahalli into a sustainable 15-minute neighbourhood represents an ambitious yet achievable model for reimagining urban living in Indian cities. This research highlights the significance of decentralised, neighbourhood-level planning as a tool for addressing the complex challenges posed by rapid urbanisation. By focusing on hyperlocal solutions tailored to the specific needs and aspirations of residents, the 15-minute neighbourhood model not only enhances quality of life but also fosters inclusivity, equity, and environmental sustainability.

The research draws on the Availability-Accessibility-Quality framework to uncover critical gaps in Nallurahalli's mobility infrastructure, public spaces, and social amenities. Addressing these gaps through the proposed Policies-Plans-Projects framework provides a roadmap for enhancing walkability, fostering vibrant public spaces, and ensuring access to high-quality amenities. Immediate interventions, such as footpath enhancements and public space upgrades, offer visible improvements, while long-term projects like ecological restoration and inclusive infrastructure development build resilience and community ownership.

Findings from this study hold significant implications for urban planning, offering actionable insights for policymakers and other key stakeholders. By embedding principles of sustainable mobility and inclusive access into planning processes, the 15-minute neighbourhood model sets a precedent for tackling urban inequities and fostering environmental sustainability.

The value of this research lies in its potential to scale beyond Nallurahalli, providing a replicable model for other neighbourhoods in Bengaluru and across India. Its emphasis on collaboration between city

governments, policymakers, development professionals, and citizens ensures that interventions are both context-specific and impactful. By positioning neighbourhoods as building blocks of urban transformation, this study offers a pathway to reimagine Indian cities as hubs of equity, sustainability, and improved quality of life.

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10 ANNEX A: BENCHMARKING OF "MUST HAVES" OF A 15-MINUTE NEIGHBOURHOOD

Indicator	Design Feature	Distance	Density
Move			
Access to NMT infrastructure	Footpaths	Minimum clear width for walking= 2mIn addition to dedicated walking area on the footpath, following zones must be provided for better walking experience: ● Minimum frontage zone width= 0.5m ● Minimum multi-utility zone (MUZ) width= 1.5m	Pedestrian density or pedestrian Level of Service (LOS) must be considered while deciding footpath widths
	Cycle infrastructure	Minimum clear width ● Cycle track (unidirectional)= 2m ● Cycle track (bidirectional)= 3m ● Cycle lane= 1.5m ● Segregated cycle lane (unidirectional)= 2m ● Segregated cycle lane (bidirectional)= 3m	Vehicle dimensions, clearance and volume (traffic) must be considered while deciding cycle track width
Access to public transport	Bus stops	Within 800m of neighbourhood Distance between bus stops: ● Arterial/sub-arterial roads= 500m	2-3 bus stops for 0.6 sqkm neighbourhood area
		● Collector/local roads= 300 – 400m	1 bus per 15,000 persons
	Metro stations	Within 800m of neighbourhood	Before metro rail can be sanctioned, it would be desirable for the city to have atleast 1 million ridership per day on organized public transport (any mode)
Access to intermediate public transport (IPT)	Auto-rickshaws/ e-rickshaws/ taxi stand	Within 400m of neighbourhood	Not available
Inclusive and accessible streets	Pedestrian crossings	At-grade crossings must be available at every 250m	Not available
	Landscape buffer	Width= 0.3 – 1.2m	Trees must be planted every 5-7m in the landscape buffer along footpaths
	Pedestrian waiting area	Street furniture must be placed at 100m intervals along roads with high volume of people	Not available
	Street lighting	Spacing of street lights along: ● Local/sub-local road: single sided, at 10m intervals ● Collector road: staggered/opposite sides, at 15m interval ● Sub-arterial road: central, at 30m intervals ● Arterial road: central+ opposite, at 30m intervals	25-30 Lux level of lighting must be available on footpaths[5].
	Wayfinding and signage	Warning signs should preferably be located: ● 1.2m ahead of pedestrian crossings ● 50m ahead of intersections	Not available
Indicator	Design Feature	Distance	Density
Play			
Access to open spaces	Parks	Within 300-800m	2-3 per 10,000 persons
	Playgrounds	Within local schools and educational institutions	2 per 10,000 persons
Inclusive and accessible public spaces	Public toilets	Every 500m in areas with high volume of people	Provision for male: 1 water closet (WC) per 100 to 400 persons1 urinal for 50 personsProvision for female:2 WCs per 100-200 persons[6]
	Drinking water fountain	Not available	Not available
Indicator	Design Feature	Distance	Density
Include			
Access to neighbourhood level markets	Local/ neighbourhood shopping complex	Within 1.5-2km of neighbourhood	1 per 15,000 persons
Access to social infrastructure	Convenience or grocery stores	Within 300-500m of neighbourhood	1 shop for every 110 persons