Developing Urban Design Guidelines for Creating Sustainable Healthy Neighbourhoods

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Abstract
The research focuses on community engagement and environmentally friendly methods in the creation of healthy neighbourhoods. Public health issues, environmental degradation, and social inequality are on the rise in urban areas as a result of rapid urbanization. A possible solution to these problems is a growing understanding of the role that good urban design can play in improving people's health and happiness. In order to identify important ideas and strategies for making healthy built environments, this study examines case studies of successful healthy communities from all over the globe, such as Medellin, Colombia; Vauban, Freiburg, Germany; and Copenhagen, Denmark, among others. In order to build healthier, more sustainable communities, the research presents a set of thorough recommendations based on public health research, stakeholder participation, and urban design ideas. In order to promote social inclusion, preservation of the environment, and equal access to resources, the standards include a wide range of topics related to urban planning, such as connectivity, the supply of green space, mixed land use, and community participation. By drawing from a variety of research fields, this research builds to what is already known about healthy neighbourhoods, vibrant neighbourhoods that all individuals can be a part of. The dissertation presents foundational principles that prioritize physical and social aspects of urban environments, emphasizing the design of neighbourhoods and cities that support human health and well-being. The main aim of this research is to develop urban design guidelines for creating healthy neighbourhoods in urban areas. By implementing these guidelines, cities can create healthier, more sustainable, and resilient communities where all individuals can thrive.
Keywords: Neighbourhood; Healthy neighbourhood; Healthy city; community engagement; liveable cities.

1. Introduction
Healthy Neighbourhood is becoming a challenge in our rapidly urbanizing global world therefore health promoting & human oriented city is a global concern. A city's social, economic, and physical environments have a role on the health of its inhabitants as the living circumstances and ways of life for city dwellers have been transformed by urbanization.

The state of our cities not only reflects the living standards of its citizens, but it also has a big impact on the sustainability and productivity of urban areas (Amen, 2021; Amen et al., 2023; Amen & Nia, 2020; Aziz Amen, 2022) . The third Sustainable Development Goal set forth by the United Nations is to "ensure healthy lives and promote well-being for all, at all ages' . Healthy cities may be built and maintained with the support of the Sustainable Cities and Communities indicators and targets included in the 11th Sustainable Development Goal. The Healthy neighborhood concept can be derived from the Healthy city concept which is defined as:"A healthy city is one that puts health, social well being,equity and sustainable development at the center of local policies, strategies and programmes based on core values of the right to health and-wellbeing, peace, social justice, gender equality, solidarity, social inclusion and sustainable development and guided by the principles of health for all, universal health coverage, intersectoral governance for health, health-in-all policies, community participation, social cohesion and innovation". -(WHO, 2020). Also according to WHO, "A healthy city is not one which has achieved a particular health status, but is one which is conscious of health and striving to improve it" (Sebastiaan, 2020). A healthy place puts a high value on equity and inclusion, in order to ensure that everyone gets equal opportunity to succeed. A healthy location is a place that is strong and resilient, where people may live and grow in an environment that caters for them and fulfils their requirements. The high population density, informal settlements, temporary jobs, a growing migrant with low incomes, and lack of infrastructure all contribute to vulnerable situation of cities. This is why it is necessary for healthy cities to initiate long term urban resilience. Through urban design rules, we may develop communities that promote physical health, social cohesion, economic prosperity, and environmental sustainability, creating growing, equitable, and resilient cities. The study aims to investigate the transformation caused by healthy neighbourhood concept and to develop urban design guidelines that promote the creation of healthy neighbourhoods in urban areas. Therefore it is essential to emphasize the significance of how healthy neighborhoods contribute to overall urban health, promoting a better quality of life, and guiding policies for sustainable and well balanced city development.

The study started from the concern that how can we transform a neighborhood facing challenges into a healthy and functioning neighborhood for its residents?

An objective framework was developed to create objectives from the study questions. These objectives served as a base for all further actions, and they also served as a framework for the methodology's creation:

1. To understand the concept of Healthy neighbourhoods.
2. To understand how healthy neighbourhoods contribute to overall city health - to identify parameters .
3. To evaluate the significance of promoting healthy neighbourhoods to make cities more liveable through case examples - how parameters are applied.
4. To develop urban design strategies for healthy neighborhood that can be formulated as guidelines - in the context of Kerala.

It is expected that the study would provide insights into the key components and principles of effective urban design for neighbourhood improvement, supported by evidence from case studies and literature review.

2. Neighbourhood and Health

A neighbourhood is a dynamic, connected community where people live, work, and interact every day. A neighbourhood is an extension of society, where individuals share interests, attitudes, and goals while navigating urban life. Peoples' health and happiness are greatly influenced by the neighbourhoods in which they belong. The physical environment, social determinants, exposure to the environment, safety, and access to services are few elements that interact within neighbourhoods to influence health outcomes for both individuals and communities. Neighbourhoods are the heart of communities, providing inhabitants with a place they consider residence while also linking them to essential necessities like market fresh food, safe parks and paths, schools, jobs, and social events. Health habits and outcomes vary within communities due to differences in access to resources, education, and other factors.

Figure 1: influence of healthy neighbourhood development

The health of people is often better in neighbourhoods where there is a high level of social cohesion and safety, while those living in areas where there are high levels of crime or social isolation may suffer from increased stress. In order to improve the health and well-being of communities as a whole, it is important to address inequalities in the local environment, promote equal access to resources, and provide supportive environments for healthy living.

2.1. Determinants of healthy neighbourhood

The way we live, the choices we make, the habits we develop on a daily basis, and the diet we follow have long been the most significant variables in determining our level of health. Humans have benefited and even flourished from communal living, group dynamics, and the many interactions that arise from such arrangements. If you want to improve your health and well-being in general, you need to start doing healthy things every day. This is especially important when it comes to minimizing the spread of disease via removal of potentially harmful substances from our homes and communities.

There are many factors that can determine health and wellbeing in our neighborhoods. These factors can be grouped into five categories: the natural environment, the built environment, activities, community, and people.

• The natural environment includes things like air, water, and land quality.

• The built environment includes things like streets, buildings, and places.

• Activities include things like working, shopping, and moving around. Community refers to social connections and networks.

• People include factors like age, sex, and heredity. All of these factors interact with each other to influence our health and wellbeing.

Other factors that can affect health and wellbeing in our neighborhoods includes climate change, local economy, community engagement and lifestyle.
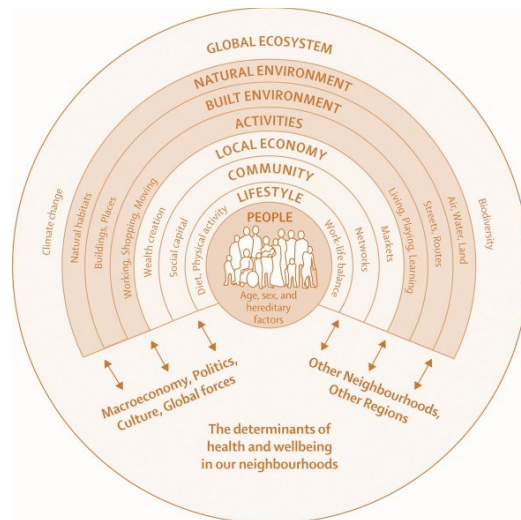
Figure 2: Determinants of healthy environment

2.2. Characteristics of healthy neighbourhood

Healthy neighbourhoods exhibit a range of characteristics that contribute to the well-being and quality of life for residents. While these characteristics can vary based on cultural, social, and geographical contexts, there are several common elements associated with healthy neighbourhoods:

- Promoting healthy lifestyles ;
- Facilitating social cohesion and supportive social networks;
- Promoting access to good quality housing;
- Promoting access to employment opportunities;
- Promoting accessibility to good quality facilities (educational, cultural, leisure, retail and health care);
- Encouraging local food production and outlets for healthy food;
- Promoting safety and a sense of security;
- Promoting equity and the development of social capital;
- Promoting an attractive environment with acceptable noise levels and good air quality Ensuring good water quality and healthy sanitation;
- Promoting the conservation and quality of land and mineral resources;
- Reducing emissions that threaten climate stability.
- Effective waste management maintains urban cleanliness and health.
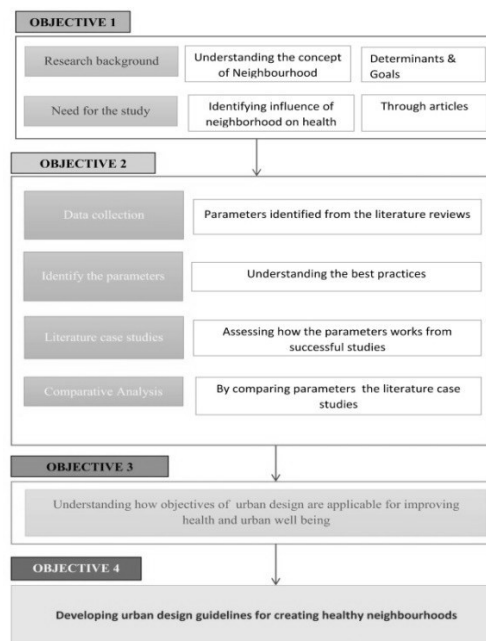
3. Material and Methods

Figure 3: Methodology

The study identifies the increasing importance of designing urban neighborhoods that promote health and well being. It outlines the objectives, which include understanding the elements that contribute to a healthy urban environment and developing practical design guidelines.The study focuses on literature reviews, case studies, and comparative analysis. Data is collected from research papers, articles, and relevant case studies concerning healthy neighborhoods and urban design.

Parameters are identified from literature reviews and assessed through comparative analysis of successful case studies to understand the impact of healthy neighborhoods on urban well being. The parameters identified from the literature and case studies were analyzed comparatively. This involved assessing the relative effectiveness of different design elements and strategies in promoting health and well being. This study looks at case studies of successful, healthy cities from all around the world, including Copenhagen, Denmark; Vauban, Freiburg, Germany; and Medellin, Colombia. The analysis helped to identify the most impactful factors and to develop a set of prioritized design principles. A brief understanding of the concepts and benefits of healthy urban design was given thorough assessments of the literature and research that was previously done.This included examining the impact of various urban design elements on physical health, mental well being, and social interaction.

Based on the insights gained from the literature review and case studies, the study formulated a set of urban design guidelines. These guidelines are intended to provide practical recommendations to create healthier neighborhoods.

The study is limited by the availability of data and literature on specific aspects of urban design and healthy city concept. The study is also limited due to time and resource constraints

4. Identifying Parameters

4.1 Assessing parameters of healthy neighbourhood from research paper review

Table 1: Identifying the parameters from research papers

SL. NO	RESEARCH PAPER/JOURNALS	FACTORS	PARAMETERS	SUB-PARAMETERS
1.	Do Healthy Cities Work? A Logic of Method for Assessing Impact and Outcome of Healthy Cities- Evelyne de Leeuw	Aimed to assess Impact and Outcome of Healthy Cities parameters for are reviewed for broader urban health tradition includes situational and contextual appreciation of unique Healthy City experiences	Accessibility	Access to public transportation
				Walkability
				Bikeability
			Green Spaces	Parks and recreational areas
				Urban greenery
				Access to nature
			Mixed Land Use	Diversity of land use
				Mixed-use developments
				Neighbourhood amenities
			Urban Form	Density
				Building design
				Public spaces
			Safety and Security	Crime prevention
				Traffic safety
				Feeling secure
2.	What is a Healthy Place? Mo dels for Cities and neighbour hoods Ann Forsyth	types of healthy neighbourhoods key challenges in studying multi- dimensional approaches to healthy places	Developing physical and institutional structures supportive of health	ensuring accessibility for all, green spaces for recreation, implementing safety measures, enhancing access to healthcare facilities, community engagement
			Emphasizes on going collaboration among sectors and affordable housing and services	availability of affordable housing, integration of different sectors
			developing physical and social structures supportive of health for all age groups	accessibility and safety of built environments, social cohesion and interaction through inclusive design

3.	Creating	Urban Planning Policies, Community Engagement, Social Equity, Environmental Sustainability, Economic Development	Urban Form and Design	Green Space, Street Design
			Transportation and Mobility	Public Transit, Vehicular Connectivity
			Social and Community Factors	Social Cohesion, Community Engagement, Safety and Security
			Environmental Quality	Noise Pollution, Water Quality, Air Quality
			Cultural and Recreational Resources	Recreational Facilities, Public Art and Expression,
4.	To study the impact of neighbourhood planning on healthy ageing	Urban Design and Built Environment, Housing and Living Arrangements, Transportation and Mobility, Environmental Quality, Cultural and Social Inclusion	Walkability, Accessibility	presence of sidewalks, pedestrian-friendly infrastructure, proximity to healthcare facilities
			Housing Affordability, Housing Security	Policies and programs to prevent housing displacement, Availability of affordable housing options suitable for older adults
			Accessible Transportation, Mobility Assistance, Pedestrian Safety	Availability of accessible public transportation options, pedestrian-friendly infrastructure
			Air and Water Quality, Green Spaces and Natural Environments, Climate Resilience	Access to parks, greenways, Strategies to mitigate the impacts of climate change
			Cultural Competency, Social Inclusion Initiatives	Inclusive policies and programs that respect diverse cultural backgrounds, languages, and traditions among older adults
5.	Focusing on the New Role of neighbourhoods: Evaluating the Planning of 20-Minute neighbourhoods in the Old and New Con texts of Mashhad City	Urban Planning Policies Built Environment, Transportation and Mobility, Economic Opportunities	Urban Planning Policies	20-Minute Neighborhood Policies, Sustainable Urban Development Strategies
			Built Environment	Diversity of Land Uses,Accessibility,Walkability Pedestrian ,Infrastructure,Public Spaces Parks and Open Spaces,Community Facilities
			Transportation and Mobility	Active Transportation, Walking Infrastructure, Cycling Infrastructure, Public Transit
			Environmental Quality	Green Spaces Park Accessibility Urban Greenery Climate Resilience
			Cultural and Social Inclusion	Cultural Diversity Cultural Amenities Multicultural Programming

6.	Health, city, and urban design Mahyar Arefi, Noha Nasser	Social and Community Factors,	Social Cohesion, Community Networks, Social Capital	Social Equity Initiatives Accessibility Measures Safety and Security

		Environmental Quality, Healthcare and Wellness Services		Crime Rates
			Environmental Quality	Air and Water Quality, Pollution Levels Access to Clean Water, Green Spaces
			Healthcare Accessibility	Availability of Medical Services Healthy Food Access, Mental Health Support
7.	Neighbourhood characteristics as determinants of healthcare utilization a theoretical model	Physical Environment, Socioeconomic Status, Social Environment	Physical EnvironmenT	Accessibility, Distance to Healthcare Facilities,Transportation Options, Safety, Lighting in Public Spaces Crime Rates
			Socioeconomic Status	Income Level Median Household Income Poverty Rates Education Level
			Social Environment	Social Support,Community Networks,Social Cohesion,Social Norms,
8.	Effects of neighbourhood features on healthy aging in place: the composition and context of urban parks and traditional local shops in Singapore	Physical Environment Features, Social Environment Features, Accessibility Features	Urban Parks Size and Accessibility Amenities and Facilities	Size, accessibility, amenities, biodiversity, maintenance.
			Community Engagement	Social activities, programs for older adults, community events.
			Mobility Infrastructure, Transportation Options,	Public transit availability, senior transportation services, parking facilities.
9.	Nonlinear Effects of the Neighbourhood Environments on Residents' Mental Health	Social Environment, Physical Environment, Cultural and Ethnic Environment:	Social Cohesion, Crime and Safety	Strength of social networks and community
			Green Spaces, Built Environment	Presence of parks, gardens, and natural environments, Presence of parks, gardens, and natural environments.
			Cultural Diversity, Cultural Diversity	diverse cultural and ethnic groups
10.	Designing healthier neighbourhoods: a systematic review of the impact of the neighbourhood design on health and wellbeing	Transportation Environment ,Social Environment, Environmental Quality	Traffic Safety, Public Transit	Accessibility and reliability of public transportation options.
			Community Spaces, Safety and Security	Availability of communal areas and gathering spaces.
			Environmental Qualit	Cleanliness and safety of drinking water sources.

4.2 Parameters dilineated from research paper review

Table 2: Parameters delineated

ASPECTS	PARAMETERS DILINEATED	SUB PARAMETERS
PHYSICAL ASPECTS	Walkability	well-connected network of sidewalks, pedestrian pathways encourages walking and promotes physical activity
		Safe and accessible walking routes
	Accessibility	Easy access to essential amenities, public transportation, Well-designed transit hubs and stations
	Green Spaces	Access to parks, gardens, and natural areas improves air quality Provide opportunities for recreation and social gatherings.
	Mixed Use Development	Integrating residential, commercial, and recreational spaces within neighbourhoods
	Infrastructures	Dedicated cycling lanes, bike paths, Integrating cycling infrastructure into urban design lifestyles.
NON –PHYSICAL ASPECTS	Sense of Place	Creating creation of unique and culturally rich urban landscapes that honour local history and identity
	Social Equity	Inclusive design and accessible public spaces ensures that all residents, regardless of age, ability, socio economic status
	Safety and Security	Well lit streets, visibility, and crime prevention measures, encourages outdoor activities, social interaction
	Community Engagement	Involving residents in the urban design process through participatory planning, community workshops

5. Literature case studies

5.1. Case studies for understanding healthy environment in a macro level

5.1.1. Copenhagen, denmark:

Copenhagen has a long history of prioritizing sustainable development, liveability, and quality of life. The decentralized approach with self-contained neighbourhoods was prioritized by planners in Copenhagen during the 20th century, when the city's population grew at an alarming rate. Inspired by the "Garden City" movement, these neighbourhoods sought to incorporate nature, social interaction, and walking distance access to amenities. The long-term vision for these neighbourhoods relied on strong citizen participation.

5.1.2. Vauban, freiburg, germany:

Vauban, Freiburg, Germany Known for its eco-friendly design, Vauban emphasizes car-free streets, energy-efficient buildings, and renewable energy sources. It encourages community engagement through shared green spaces, community gardens, and participatory planning processes. The development of Vauban in Freiburg, Germany, was driven by a set of ideals and ideas aimed at creating a sustainable and inclusive community. Several features and initiatives contributed to the healthy neighbourhoods and positive outcomes in Vauban.

5.1.3. City quarter in linz, austria:

City Quarter in Linz was developed as part of a comprehensive urban renewal project in the city centre. The area was previously characterized by aging infrastructure, vacant lots, and underutilized spaces. The redevelopment aimed to revitalize the neighbourhood, enhance liveability, and promote sustainable urban development. The solar City in Linz, Austria, was developed with a focus on creating a sustainable and environmentally friendly community.

5.2. Case studies for understanding healthy environment in a micro level

5.2.1. Pearl district, portland, oregon:

In the early 1980s, planning initiatives commenced to transform under-utilized warehouses and abandoned rail yards into a mixed-use neighbourhood in what was formerly a marshland along the Willamette River. The area underwent a development boom in the 1990s, becoming more desirable for urban living and driving up land values and rents.

5.2.2. Comuna 13, medellin, colombia:

Comuna 13, a neighbourhood in Medellin, Colombia, was once notorious for its high levels of crime, violence, and social exclusion. The neighbourhood faced numerous challenges, including poverty, unemployment, inadequate infrastructure, and gang-related violence. However, through a comprehensive urban renewal initiative, Comuna 13 underwent a remarkable transformation into a vibrant and thriving community known for its resilience, social innovation, and commitment to peace.

5.2.3. Cumbernauld in scotland:

City Quarter in Linz was developed as part of a comprehensive urban renewal project in the city centre. The area was previously characterized by aging infrastructure, vacant lots, and underutilized spaces. The redevelopment aimed to revitalize the neighbourhood, enhance liveability, and promote sustainable urban development. The solar City in Linz, Austria, was developed with a focus on creating a sustainable and environmentally friendly community.

Parameters	Copenhagen, Denmark	Vauban, Freiburg, Germany	City quarter , Linz, Austria	Pearl district, Portlan, Oregon	Medellin, Colombia	Cumbernauld, Scotland
Accessibility	promoting cycling infrastructure, improving public transportation pedestrianizing city centers, integrating universal design principles, and smart mobility solutions.	sustainable transportation modes like cycling and public transit, implementing pedestrian-friendly urban design, and ensuring barrier-free access to buildings and public spaces.	improving public transportation infrastructure, implementing pedestrian-friendly urban design,	creating pedestrian-friendly streetscapes, implementing traffic calming measures	strategies for enhancing accessibility include improving public transportation infrastructure,	ensuring equitable access to amenities and services for residents of all abilities.
Walkability	pedestrianizing city centers, implementing wide sidewalks, creating pedestrian-friendly streetscapes, and promoting mixed-use neighborhoods with easy access to amenities and services	pedestrian-friendly streetscapes, implementing traffic calming measures	creating pedestrian-friendly streetscapes, implementing traffic calming measures, and prioritizing mixed-use development to ensure amenities are within walking distance	improving public transportation infrastructure, implementing universal design principles,	involve creating pedestrian-friendly streetscapes, implementing traffic calming measures	creating pedestrian-friendly streetscapes, implementing traffic calming measures,
Green spaces	creating and maintaining parks, gardens, and urban green areas, as well as promoting biodiversity and integrating nature into the urban environment	gardens, and urban green areas, promoting biodiversity, and integrating nature into the urban environment	urban gardens, and green corridors, as well as promoting biodiversity and integrating nature into the urban fabric	promoting sustainable landscaping practices to improve residents' quality of life and environmental sustainability	creating and preserving parks, urban gardens, and green corridors, as well as promoting sustainable landscaping practices to improve residents' quality of	maintaining parks, green corridors, and recreational areas, as well as promoting biodiversity and sustainable landscaping practices to improve residents' quality of life

|					life and environme ntal sustainabili ty.	
Mixed use development	a combination of residential, commercial, and recreational spaces within close proximity, vibrant and diverse communities with easy access to amenities and services	promoting a diverse range of residential, commercial , and recreationa l amenities within close proximity, fostering vibrant and cohesive communiti es.	All amenities within close proximity, fostering vibrant and inclusive communiti es	Creating vibrant urban environme nt that encourages walkability and community interaction.	vibrant and inclusive communiti es with a strong sense of place and identity	strategies for enhancing mixed-use neighborhoods involve promoting a diverse mix of residential, commercial, and recreational amenities
Sense of place	a mix of near by commerci al, residential , and recreati onal areas; liv ely, diversifie d communitie s with simple access to serv ices and ame nities	encouragin g public arc hitecture a nd art, as w ell as com munity inv olvement, t o develop t he city's ow n character	Creating local identity through public art and events, and promoting community involvemen t in shaping the neighborho od's character and identity.	preserving historic architectur e, promoting public art installation s	preserving cultural heritage, creating community identity through public art and events	strategies for enhancing sense of place involve preserving local heritage, promoting community events and public art installations,

Social equity	promoting affordable housing initiatives, implementing inclusive urban design policies	providing access to social services and amenities for all residents regardless of socioeconomic status	implementing inclusive urban planning policies to address the needs of diverse socioeconomic groups within the community	promoting affordable housing initiatives, supporting local businesses owned by marginalized communities,	promoting affordable housing initiatives, implementing inclusive urban planning policies, and providing access to social services and amenities for all	promoting affordable housing initiatives, supporting local businesses owned by marginalized communities,
Safety and security	Well lit public spaces, community policing programs, active surveillance systems, and inclusive urban design that prioritizes pedestrian and cyclist safety	implementing community policing programs, improving street lighting and surveillance systems	improving street lighting and surveillance systems, and creating strong social cohesion	improving lighting and surveillance systems in public spaces,	implementing community policing programs, improving street lighting and surveillance systems,	setting in place neighborhood security initiatives, enhancing surveillance and street lighting
Community engagement	participatory urban planning processes, neighborhood forums, cultural events, and community-based projects that encourage collaboration and social interaction among residents.	participatory decision-making processes, promoting neighborhood associations	promoting neighborhood associations and events, and facilitating collaboration between residents and local authorities to address community needs and priorities.	involve facilitating regular neighborhood meetings, supporting local community organizations and events	upporting grassroots initiatives, and fostering collaboration between residents and local authorities to address community needs	improving street lighting and surveillance systems, creating strong social cohesion through community engagement initiatives to create safer neighborhoods for residents

4. Study area

Kerala has a growing elderly population and lacks accessible neighborhoods with well-maintained sidewalks, ramps, and public transport allow seniors to stay independent and active for longer. Green infrastructure and walkable areas can buffer against floods and extreme weather events, a growing concern for Kerala. Walkable, accessible neighborhoods encourage physical activity, a crucial factor in preventing health issues. Easy access to amenities, reduced traffic, and spaces for community interaction can make Kerala's cities and towns even more attractive places to live, work, and raise a family. Kerala's impressive social indicators can be further enhanced by healthy neighborhoods.

4.1 Relevance of the site

Based on the area of concern, neighbourhood area Kamaleswaram in Thiruvananthapuram ,the capital city of Kerala is taken for assessing how the parameters of healthy neighbourhood works in the area. Trivandrum is the most populous city in Kerala with a population of 957,730 as of 2011 and the neighbourhood area lies in the core area. Kamaleswaram is one of the main suburbs of Thiruvananthapuram. It boasts having several temples and mosques which are of historic significance. Kamaleswaram is 2 km from the city centre. Kamaleswaram is a bustling residential region.
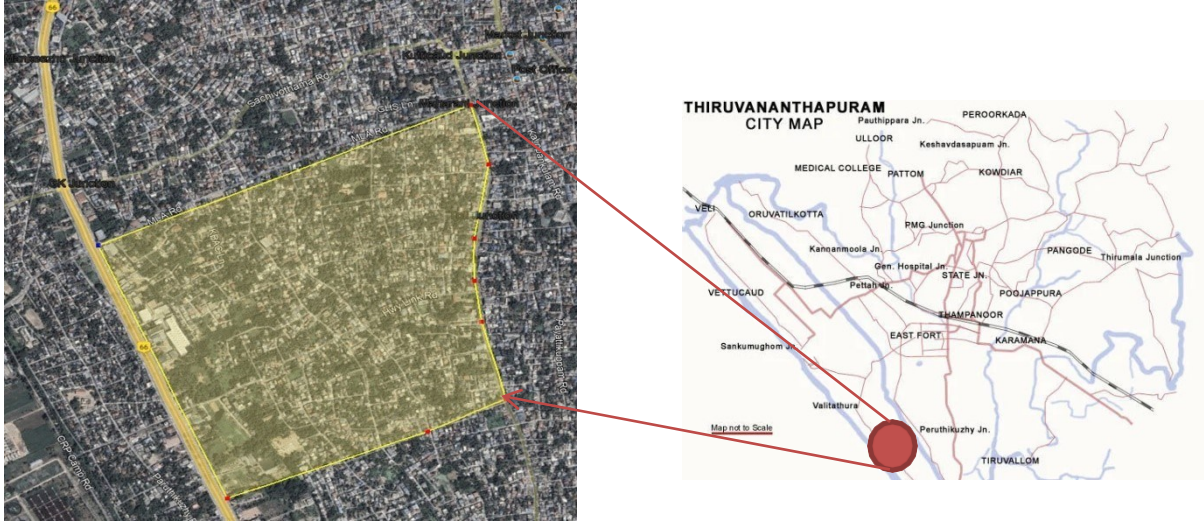
Figure 4: Dilineated site area

4.2. Analysis based on each parameter

4.2.1 Street layout :

Kamaleswaram is primarily dominated by residential properties, with a focus on housing for local residents. The majority of the area is occupied by homes and residential complexes, indicating a clear residential character and the commercial characters are seen along the main roadways. There is no designated parking creating traffic congestion during peak time , pedestrian pathway not provided and no provision for bicycle tracks.Therefore the strategies includes:
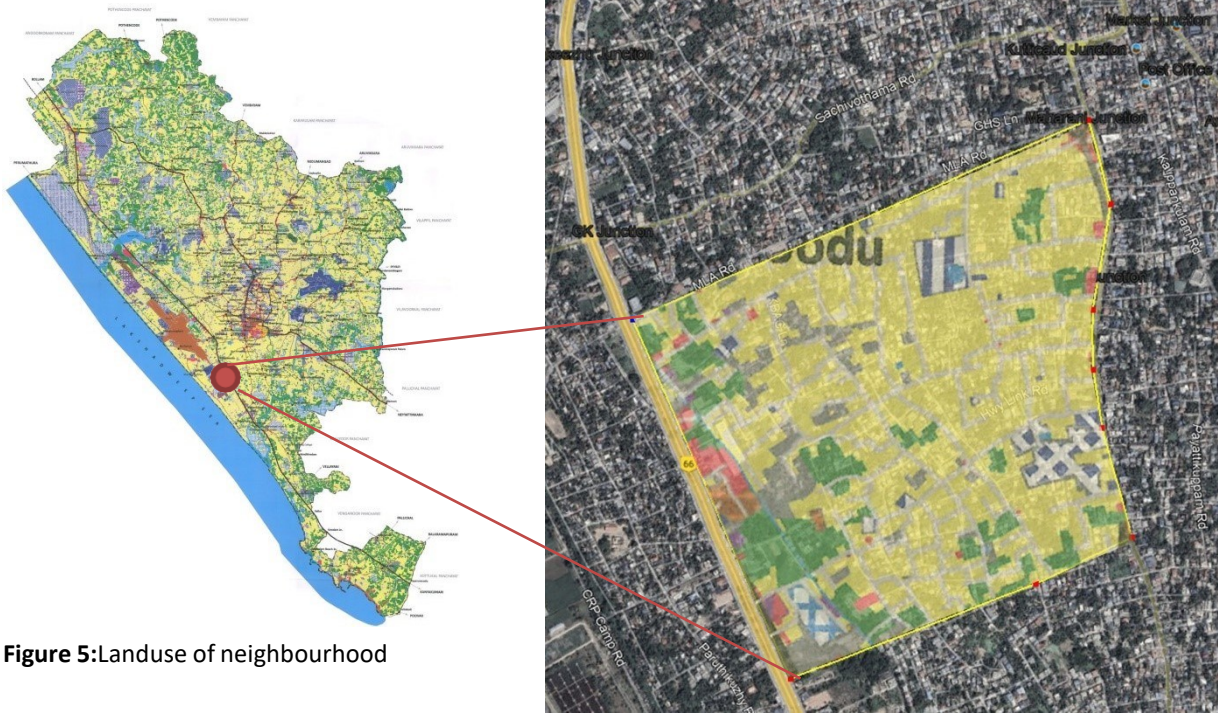
4.2.1.1 Traffic flow:
- Preventing unnecessary traffic movement
- Set Speed Limits through Speed bumps and sign ages
- one way traffic movement

4.2.1.2 On street parking:
- Designated parking to be provided
- No parking on lesser wider roads
- Two-side parking to be divided down by planted areas
- Bicycle parking can be placed in between

4.2.1.3 Street type:Mixed use neighborhoods

The positioning of basic amenities like health care centers, day care centers, play grounds and other amenities within a neighborhood requires careful consideration.

Figure 5: Landuse of neighbourhood

4.2.1.2 Traffic flow:
- Preventing unnecessary traffic movement
- Set Speed Limits through Speed bumps and sign ages
- one way traffic movement

4.2.1.3 On street parking:
- Designated parking to be provided
- No parking on lesser wider roads
- Two-side parking to be divided down by planted areas
- Bicycle parking can be placed in between

4.2.2 Pedestrian environment :
In the neighbourhood, there is lesser wider roads with no pedestrian pathways and Vehicles parked on 4m wide road creating congestion. There is lesser wider roads with no pedestrian pathways and green spaces.Vehicles parked on 4m wide road creating congestion.Therefore the strategies includes:
4.2.2.1 Pathway:
- Making pedestrianized only ways in possible streets by prohibiting vehicular movement.
- Clear walkway on one side, with spaces for planters can be provided.

4.2.2.2 Providing green space:
- Plants can be placed in various zones in the street.
- Provide planting at different heights- trees for shading
- creates spaces for greenery
- Provide local plants that suits the climate

4.2.3 Neighbourhood connectivity:
Kamaleswaram is 2 km from the city centre. Privately owned and KSRTC buses plying in the Kovalam route from East Fort pass through Kamaleswaram. A bypass of National Highway 47 passes 1 km to the west of Kamaleswaram. Nearest railway station, around 3 km away. The nearest airport is Thiruvananthapuram International Airport, around 4 km away.
4.2.3.1 Aceessibility:
Provide essential amenities where they are well connected to the whole neighborhood**.**
4.2.4 Public space:
In Kamaleswaram, open spaces are not well utilised . Waste dumping on the open spaces creating pollution and diseases to the neighborhood residents. The existing open spaces are also not safe during nighttime. The strategies includes:

4.2.4.1 Open space:
- Provide neighborhood parks
- open spaces should have a diverse landscape and varied vegetation
- Should be Safe spaces
- parks should be increased

4.2.4.2 Community space:
- Central open space in between the convenient shops as a socializing area
- community spaces with flexible layouts and multi functional features that can accommodate a variety of activities and events, such as festivals, markets, performances, and fitness classes.

4.2.5 Safety and security:

Many streets in the neighbourhood are not well lit, open spaces are not well and during night time these areas are not safe for pedestrians.Due to waste dumping and no ighting there is also issue of increasing stray dogs
The strategies includes:

4.2.5.1 Street lighting:
- Provide adequate lighting levels along streets, sidewalks, and intersections to ensure visibility for pedestrians, cyclists, and motorists, particularly at night or in low-light conditions.
- Illuminate critical areas such as crosswalks, bus stops, bike lanes, and public transit stations to enhance safety and security for pedestrians, cyclists, and transit users.
- Integrate lighting into the overall streetscape design, considering factors such as street furniture, landscaping, signage, and public art to create visually appealing environments.

4.2.5.2 Crime prevention:
- Design streets, buildings, and public spaces to maximize visibility and natural surveillance, minimizing opportunities for criminal behavior and create a sense of safety and security among residents
- Design streetscapes, public spaces, and building facades with crime prevention features like lighting, landscaping, signage, and urban design elements that enhance safety, visibility, and wayfinding.

4.2.6 Sense of place:

4.2.6.1 Public art installations:
- Integrating public art into existing infrastructure like transit stops, pedestrian plazas, street furniture, and architectural facades, to create cohesive and harmonious urban landscapes.
- Ensure public art installations are accessible to people of all ages, abilities.
- Consider the physical, cultural, and historical context of the neighborhood when designing public art installations.

4.2.6.2 Preservation:
- Encourage adaptive reuse and rehabilitation of historic buildings in the neighbourhood
- Preventive maintenance plans to ensure the preservation and durability of historic buildings, structures and public areas.

4.2.7 Social equity:

4.2.7.1 Inclusive design:
- Inclusive spaces are important to make sure that parks and open spaces serve everyone in a neighborhood equally.
- Inclusive parks should cater to children of all abilities and social classes.
- The access to the space should be barrier free and should have sufficient area to accommodate differently abled
- Wide ramps for easy wheelchair access.

5. Conclusions

Healthy neighborhoods are starting to come to the forefront of modern urban discussion, attracting the attention of planners, designers, politicians, and citizens alike. Developing urban design principles that promote health and fairness in community development is essential since the quality of our built environment greatly influences our physical, emotional, and social well-being. These urban design standards have been shaped by the understanding of elements impacting the well being of neighbourhoods, including economic, social, cultural, and environmental aspects. neighbourhoods that encourage physical exercise, access to green areas, and clean air, as well as social cohesiveness, cultural vitality, and economic opportunity, are our goal when we include these many elements into the design process. These principles provide a way forward for building communities that are resilient, liveable, and inclusive, which improves the health and well-being of all people via multidisciplinary cooperation, evidence-based practice, and stakeholder involvement. This dissertation focuses on urban planning and urban design , which take

into account the reality that communities wants and requirements differ greatly depending on variables like demography, location, and cultural history. So that interventions may be adapted to each neighbourhood's specific requirements, the suggested urban design guidelines stress adaptation, participatory decision-making, and flexibility. The long-term sustainability and resilience of communities may be enhanced by encouraging local participation in design and development. Environmental sustainability, social fairness, and economic growth are just a few of the urban concerns that this dissertation brings to light as being interrelated to health. By taking a comprehensive view of community planning, we can tackle these problems in a coordinated style, making the most of the built environment's power to improve lives in many different ways.

This dissertation explores concept of healthy neighborhoods through research and analysis, proposing adaptable urban design principles to address the challenges and opportunities of urban growth. It outlines key considerations across various aspects, including street layout, pedestrian environment, neighborhood connectivity, public space provision, fostering a sense of place, ensuring social equity, and prioritizing safety and security.

The urban design strategies can be adapted to build communities that encourage interaction between people , and a strong feeling of belonging. Better health results, more safety, and a stronger sense of community will all benefit the locals. Public areas will develop into dynamic centers of neighborhood activity that promote social contact and strengthen the social fabric.

Building resilient and sustainable communities will be made possible by following to these rules. People will feel more secure and live in a healthier environment if green areas are encouraged, pedestrian traffic is prioritized, and crime prevention design features are included.

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Conflict of Interests
The Author(s) declare(s) that there is no conflict of interest.

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