



Analysing the transformation of Commercial Centres with respect to the process of urban development in a city: identification of relevant parameters and sub-parameters

Análisis de la Transformación de los Centros Comerciales con respecto al proceso de desarrollo urbano de una ciudad: identificación de parámetros y subparámetros relevantes

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ABSTRACT The transformation of commercial centres is a common feature of current urban development processes, where modern typologies of commercial centres are generated alongside traditional markets, disrupting the urban fabric of Indian cities. This disruption has led to lifestyle changes and altered the character of public places. The existing literature has not adequately explored this issue from an urban design perspective for Indian cities. To predict the future direction of transformation, a holistic study of this phenomenon is imperative. This paper aims to theoretically identify the relevant parameters, sub-parameters and variables that influence this phenomenon in the Indian context. Furthermore, it seeks to establish a theoretical framework based on their inter-relationship for examining similar transformations in contemporary urban development processes.

RESUMEN La transformación de los centros comerciales es un fenómeno común en los procesos de desarrollo urbano actuales, en los que se han generado tipologías modernas de centros comerciales junto con mercados tradicionales que han creado disrupciones en el tejido urbano de las ciudades indias. Esto ha provocado cambios en el estilo de vida de las personas y en el carácter de los espacios públicos. La literatura existente no ha explorado este tema desde el punto de vista del diseño urbano para las ciudades indias. Para predecir la dirección futura de la transformación, es imperativo realizar un estudio holístico de este fenómeno. Este artículo intenta identificar teóricamente los parámetros, subparámetros y variables relevantes que influyen en este fenómeno en el contexto indio y establecer un marco teórico basado en su interrelación para examinar más a fondo transformaciones similares en los procesos de desarrollo urbano contemporáneos.

Recibido: 15/09/2024
Revisado: 25/05/2025
Aceptado: 04/06/2025
Publicado: 26/01/2026

KEYWORDS commercial centres, transformation of commercial centres, urban development, process of urban development, parameters

PALABRAS CLAVE centros comerciales, transformación de centros comerciales, desarrollo urbano, proceso de desarrollo urbano, parámetros



Cómo citar este artículo/How to cite this article: Sarkar, S. & Nag, S. (2025). Analysing the transformation of Commercial Centres with respect to the process of urban development in a city: identification of relevant parameters and sub-parameters. *Estoa. Revista de la Facultad de Arquitectura y Urbanismo de la Universidad de Cuenca*, 15(29), 233-246. <https://doi.org/10.18537/est.v015.n029.a15>

1. Introduction

Commercial centres are economic, social, cultural and administrative hubs for any city. These centres have been transformed from marketplaces to multi-functional public spaces and are used as image-making entities to highlight the distinctiveness of cities. This transformation of commercial centres has shaped the commercial and physical structure of cities. Cities in the Global South, such as Shanghai, Hong Kong, Guangzhou, Delhi, Mumbai, Bengaluru and Kolkata, have undergone significant changes in urban patterns and have become major commercial hubs of the world. At the city level, commercial centres act as generators of development, providing goods, services and opportunities for the population. Hence, the transformation of commercial centres and the process of urban development are interdependent.

In urban development, urban transformation processes vary widely between renewal and rehabilitation of urban areas, resulting in the growth and expansion of cities. Following World War II, nations were classified based on their GDP, with a distinction between developed and developing countries, and a scale for measuring the degree of development emerged. Markets opened and trading policies were adjusted to induce rapid development across all sectors, creating global cities. A tactical transformation of commercial centres in cities was caused by a "variety of institutional restructuring to enhance their local economic growth capacities" (Chattopadhyay, 2017). The process of urban development thus affected commercial centres at the local level.

Different typologies of commercial centres generated various business models. Shopping malls and big-box stores were popular in the West for their commercial growth. This model was used worldwide due to globalisation in cities. Global trends in urban development have given rise to megacities (populations of 10 million or more) or large cities (populations of 5–10 million), exerting developmental pressure on infrastructure and resulting in expansion. This altered the developmental patterns, social and cultural norms and spatial and organisational configurations of cities. Traditional markets and shopping malls co-exist, giving rise to conflicting urban spaces. This phenomenon is largely uncontrolled and sporadic, creating an unorganised spatial/physical environment. To restrict further deterioration, immediate intervention is necessary to rectify the lacuna and arrest such developments.

The primary objective of this study is to explore literature related to the transformation of commercial centres and the process of urban development to identify the relevant latest research trends, gaps and questions. The secondary objective

is to study and establish a parametric relationship between the transformation of commercial centres and the process of urban development, based on a literature study.

2. Methods

The study was conducted in three stages: literature review; identification of parameters, sub-parameters and variables; and formulation of a theoretical framework. The literature study included references from primary sources, such as books and journals, and secondary sources, including research articles in e-journals listed in SCOPUS and Web of Science, with a focus on the Global South, particularly within the last 7 years. The inferences derived are described below.

2.1. Literature study

The first stage involved a literature review of the following keywords: commercial centres, transformation of commercial centres, urban development and process of urban development. The major parameters influencing the transformation of commercial centres and the process of urban development in a city were identified. This stage also highlighted existing research gaps and helped in formulating relevant research questions.

2.1.1. Urban development and the process of urban development

In the Global South, rapid urbanisation has led to polycentric growth. City extensions and sub-centres have been developed in India. The salient features related to the process of urban development, as reported in the literature, are as follows:

- a. Urbanisation is a complex and varied process, and thus, urban areas should be considered as multi-level systems (Chattopadhyay, 2017). "Urban dynamics involving large-scale changes in land use depend on (i) the nature of land use and (ii) the level of spatial accumulation" (Ramachandra et al. 2012, p. 330). In India, a 44% growth rate of the urban population and a 29.5% reclassification of rural settlements into towns in the 2011 Census led to a migration of population to cities.
- b. One of the indicators for land-use change is the concentration of centres or decentralisation and the "spatial pattern of urban land-use change in relation to the existing settlement area" or urban transformation (Nuisl and Siedentop, 2021, p. 79).
- c. In literature, common parameters influencing urban transformation regarding urban development are vitality (Ravenscroft et al., 2000; Bosselmann, 2012; Zaidin et al., 2015;

- Kim, 2020; Ghahremani et al., 2021; Xia et al., 2022; Jin et al., 2024), liveability (Bosselmann, 2012; Ellis and Robert, 2015; Choon-Piew, 2016; Kotby et al., 2021; Ghahremani et al., 2021) and sense of place (Bosselmann, 2012; Ilgin and Hacıhasanoğlu, 2010; Sepe, 2014; Beyhan and Gürkan, 2015; Lee, 2018; Hölscher and Frantzeskaki, 2021; Ghahremani et al., 2021; Shamur, 2023).
- d. Internationally, Strategy 2030 was put forward in the Sustainable Development Goals of 2015, where Goal 8 (Sustainable Economic growth) and Goal 11 (Sustainable Cities and Communities) work towards the upgradation of quality of life via inclusive, resilient and sustainable measures in urban transformation. In India, the Smart Cities Initiative in 2021 addresses the “challenges faced by cities due to rapid urbanisation” and “enhances liveability of cities and quality of life” (p. 6).
 - e. In India, Jawaharlal Nehru National Urban Renewal Mission (JNNURM) (2005), a mission-mode programme, aims to create “economically productive, efficient, equitable and responsive cities” (p. 5) by “upgrading social and economic infrastructure in cities” (p. 4). The Smart Cities Mission (2019) aims to create “liveable, sustainable cities providing economic opportunities to people” and was used to make “vibrant public spaces” and “revolutionise placemaking” in smart cities, focusing on vitality. The Streets for People Initiative involves the development of data-based transformation for the enhancement of liveability. The Ease of Living (EOL) Index 2019 assesses “quality of life, economic ability and sustainability” in cities via “trading clusters” (p. 2). The Atal Mission for Rejuvenation and Urban Transformation (AMRUT) 2015 scheme has sub-schemes aimed at developing open spaces and public spaces, thereby promoting urban vitality.
- Istrate and Chen, 2022; Abdulaameer et al., 2024) and “active edges” (Istrate and Chen, 2022; Abdulaameer et al., 2024) determines economic vitality (Abdulaameer et al., 2024).
 - b. Liveability is affected by urban transformation, especially in commercial areas (Istrate and Chen, 2022). The presence of convenient shops, commercial facilities and schools enhances the liveability of neighbourhoods (Istrate and Chen, 2022).
 - c. The sense of place creates publicness and a sense of belonging in commercial centres, improving wellbeing in neighbourhoods (Mehrbani et al., 2018; Nambuge et al., 2020; Istrate and Chen, 2022; Pettersen et al., 2023). In recent times, commercial centres such as shopping malls have become a refuge from the harshness of public places and fast traffic, making them essential public spaces (Mandeli, 2019).
 - d. In India, government policies such as Smart City Mission and urban rejuvenation schemes have caused the transformation of commercial spaces. “Commercial real estates are now targeting Tier-II and Tier-III cities as they are rapidly urbanising and businesses are often shifting to these cities to save on operational costs” (Taneja, 2022). Shopping malls and business centres have developed rapidly in cities such as Patna, Jaipur, Coimbatore and Tiruchirappalli under the mission in 2023. This development has led to a change in the shopping pattern and urban place perception among Indian consumers with changing liveability and sense of place (Roy and Ray, 2017; Taneja, 2022).
 - e. In Indian cities, the introduction of commercial projects regulates the vitality, liveability and sense of place of urban areas. For example, City Centre Mall, Salt Lake, Kolkata, which was completed in 2004, has been successful in creating public spaces within a residential city extension. In contrast, the redevelopment of College Street Market in Kolkata has not progressed as desired, with the mall still under construction, resulting in a loss of vitality in the heart of the city.

2.1.2. Commercial centres and the transformation of commercial centres

Rapid decentralisation and urbanisation in cities have made the vitality of town centres an important topic of discussion (Ravenscroft et al., 2000). The salient features related to commercial centres and the transformation of commercial centres are as follows:

- a. Urban transformation is influenced by vitality, liveability and a sense of place and vice versa in the process of urban development (Bosselmann, 2012; Ellis and Robert, 2015; Choon-Piew, 2016). Commercial activities lead to urban consumption, causing a rise in economic vitality and vice versa (El-Khouly et al., 2023). The presence of “mixed-use activities” (Jacobs, 1961; Istrate and Chen, 2022), “retail activities” (Mehrbani et al., 2018;

Thus, the three major parameters affecting the transformation of commercial centres with respect to the process of urban development are vitality, liveability and sense of place.

2.1.3. Research gaps and research questions

In the literature, studies have focused on aspects related to types of public spaces, commercial streets, shopping behaviour, building typology, etc. Similar changes have occurred in Indian cities. Such studies are needed in the Indian context for commercial development. The evolution of shopping styles and building typologies has made customers

move towards peri-urban areas in the vicinity of city centres. This movement has rapidly increased the number and types of commercial centres, resulting in scattered development. Literature has not explored this phenomenon from an urban design perspective for Indian cities. The parameters of vitality, liveability and sense of place have been separately examined with respect to commercial centres on several occasions. To understand the direction of transformation, it is essential to study it holistically. The complexity of the urban fabric in Indian cities necessitates the identification of generic recommendations to guide the development of successful and cohesive public spaces, such as commercial centres, in Indian cities.

The relevant research questions generated from the above discussion are as follows:

RQ 1. What are the transformations occurring in commercial centres with respect to the established parameters of vitality, liveability and sense of place in India?

RQ 2. What are the related sub-parameters of vitality, liveability and sense of place that influence the transformation of commercial centres with respect to changes in the process of urban development in India?

2.2. Identification of related parameters, sub-parameters and variables

In the second stage, the parameters of vitality, liveability and sense of place were further studied to identify the related sub-parameters and variables. This stage utilised a focused literature review, drawing on journals, books and associated literary sources, to identify the most common sub-parameters and variables for each parameter. Some salient features of the study are as follows:

2.2.1. Vitality

Vitality is the measure of publicness of a place. It is "the degree to which an individual can acquire nutrition, safety and ergonomic needs from the environment for survival" (Lynch, 1987, p. 123). Vitality of cities is "the ability of attracting lively businesses and human activities, which depends on spatio-temporal gathering of human flows" (Zhang, et. al, 2021, p. 4). It is influenced by activity (Mandeli, 2019; Mehrbani et al., 2018; Istrate and Chen, 2022). The higher the pedestrian flow, the greater the activity. Active frontages along road edges of commercial centres help in creating an active edge (Istrate and Chen, 2022; Abdulameer et al., 2024). High vitality areas are found in places with mixed land use, good accessibility and liveability (Zeng et al., 2018; Istrate and Chen, 2022). The connection among public, commercial, recreational and religious activities ensures the public character of urban spaces (Latham and Layton, 2019).

The presence of formal and informal activities contributes to increasing the level of publicness of commercial centres (Zeng et al., 2018; Mandeli, 2019; Carmona, 2019). The availability of varied products and services and attraction factors influencing shoppers' satisfaction, such as loyalty and word of mouth (Ahmad, 2012), are key drivers for new marketplaces. Consequently, in India, shopping centre inventory has increased to 125 million square feet across 340 operational properties in 29 cities, primarily in the form of shopping malls in both Tier I and Tier II cities. Other parameters for commercial areas include access, conviviality and comfort, distinctiveness, safety, robustness and flexibility.

The size and density of the people determine the liveliness of a place. Quantitative parameters for measuring density include floor-area ratio, built-up area and built-up volume. The presence or absence of public places affects interaction and activity levels, which in turn influence vitality (Carmona, 2019). The rapid development of shopping malls has led to the emergence of "dead malls" (Guimarães, 2018). In cities such as New Delhi, "the mall vacancy rate has increased to 36,2% in 2023 from 33,5% (2022)" (Kumar, 2024). There have been "high vacancies due to poor customer footfalls and low revenue" in Kolkata (Niyogi, 2024, párr. 1).

The advent of an unprecedented pandemic has raised questions about the type of commercial space that works for public spaces. Comfort parameters, such as physical comfort and safety parameters, including active and passive surveillance,

ensure vitality (Carmona, 2019). In India, “the importance of having fine urban grain for improved visual connectivity and movement patterns is to ensure safety” (Tiwari, 2015).

While market redevelopment projects are being imposed on traditional markets in metropolitan cities, the displacement of existing vendors and gentrification have become potential downsides. Changes in functionality have drastically affected marketplaces; for example, the new proposal for the Janata Bazaar marketplace in Hubballi, Bengaluru, under smart city redevelopment, proposes a mall-type building, ignoring the socio-cultural aspects. The informal sector plays a crucial role in maintaining publicness in formal commercial spaces, which is often absent in these building types. There is a need for inclusive urban planning and design principles to integrate modern and traditional concepts of Indian commercial centres. A summary of recurring sub-parameters and their related variables for the vitality parameter is provided in Table 1.

2.2.2. Liveability

Liveability is related to “good transportation network, comfortable urban spaces, walkable public areas and sound ecology—an integration of human activities with forces of nature” (Bosselmann, 2012). For successful public spaces and commercial centres, liveability is a key parameter (Rahman et al., 2015; Ghazi and Abaas, 2019).

The liveability of commercial centres depends on location (Ghazi and Abaas, 2019). The distance from the central business district and city-level connectivity determine the success of commercial centres (Ghazi and Abaas, 2019; Chen et al., 2020). Additionally, it depends on the ease of accessibility (Ghazi and Abaas, 2019). The accessibility of shopping malls is analysed based on the factors of visibility, access, signage and information (Poldma et al., 2014; Istrate and Chen, 2022). In marketplaces, various services with proper connectivity increase their attractiveness both at the city and neighbourhood level (Istrate and Chen,

Sub-parameters and variables for vitality				
Sub-parameters	Broad requirements		Variables	Authors
1	Activity	Liveliness Publicness	<ul style="list-style-type: none"> – Pedestrian flows – Formal and informal activity – Type of commercial activity – Amount of commercial activity – Product mixes – Active frontages 	Mandeli, 2019; Istrate and Chen, 2022; Li, 2022
2	Rental value	More active areas have higher rental values Land prices and property prices increase Vacancy rates increase due to low vitality	<ul style="list-style-type: none"> – Land value – Rent per square foot per day gives a comparative cost between different commercial centres 	Heffernan et al., 2014; Ke, 2016
3	Density	The number of people getting access to the market in the neighbourhood scale on an average	<ul style="list-style-type: none"> – Size, density and heterogeneity of the people – Increased building density increases street activity – Smaller distances or shorter blocks improve accessibility – Mixed-use buildings increase functionality – Indicator businesses in denser neighbourhoods 	Wirth, 1938; Jacobs, 1961; Durand, 2011; Jacobs, 1961
4	Accessibility	Connectivity Permeability Walkability	<ul style="list-style-type: none"> – Number and type of access roads – Type of transport available 	Jacobs, 1961; Teller and Reutterer, 2008, Heffernan et al., 2014
5	Public space types and characteristics	Types and number of public spaces generated due to active commercial centres	<ul style="list-style-type: none"> – Formal public spaces – Informal public spaces 	Carmona, 2019
6	Urban form	Urban morphology is key to the transformative process of development Physical entities of the urban form dictate vitality and attractiveness	<ul style="list-style-type: none"> – Shape – Size – Volume of space allocated 	Mandeli, 2019; Carmona, 2019; Li, 2022
7	Customer views	Queries and feedback		Poldma et al., 2014
8	Safety	Free from crime and fear of crime	<ul style="list-style-type: none"> – Design for natural surveillance, no. of active front-ages – Mechanical surveillance 	Abdulameer et al., 2024
9	Comfort	A physically and mentally comfortable shopping environment	<ul style="list-style-type: none"> – Thermal comfort – Acoustic comfort – Visual comfort 	Carmona, 2019
10	Conviviality	Liveliness Publicness		Heffernan et al., 2014
11	Robustness	Resilience	<ul style="list-style-type: none"> – Relationship between retail areas and blocks – Response to external shocks (disasters) 	Heffernan et al., 2014
12	Flexibility	Flexibility of use Flexibility of design	-	Heffernan et al., 2014

Table 1: Table showing relevant parameters, sub-parameters and variables related to the vitality of the transformation of commercial centres with respect to the process of urban development. (2022)

Sub-parameters and variables for liveability				
	Sub-parameters	Broad requirements	Variables	Authors
1	Location	Position of commercial centres	<ul style="list-style-type: none"> Size of CC Distance of CC from CBD Access routes at the city level Layout of CC 	Christaller, 1933; Ghazi and Abaas, 2019
2	Accessibility	Ease of access Walkability	<ul style="list-style-type: none"> Access routes at the site level Modes of transportation frequently used Distance of CC from the neighbourhoods 	Christaller, 1933; Lösch, 1954; Jacobs, 1961; Bosselmann, 2012; Heffernan et al., 2014; Ghazi and Abaas, 2019; Chen et al., 2020; Istrate and Chen, 2022
3	Attractiveness	Physical form Urban form	<ul style="list-style-type: none"> Size of the marketplace Layout of the marketplace Significant architectural features 	Bosselmann, 2012; Alfonso, 2005
4	Land value	The price of land determines the type of commercial activity		Paul, 2020
5	Safety	More safety ensures more crowd	<ul style="list-style-type: none"> Natural surveillance-active frontages Mechanical surveillance 	Alfonzo, 2005; Mehta, 2008; Istrate and Chen, 2022
6	Maintenance and cleanliness	Hygienic conditions	<ul style="list-style-type: none"> Cleanliness schedules Staff 	Balsas, 2004; Alfonso, 2005; Mehta, 2008
7	Health	Urban health in public places		Mehta, 2008
8	Control	Increased control restricts public activity	<ul style="list-style-type: none"> Number of entries and exits Security checks Restrictions on crowding Boundary conditions 	Lynch, 1987; Shamsuddin, 2012
9	User behaviour	Determining the product mix	<ul style="list-style-type: none"> Types of shops Footfall 	Teller and Reutterer, 2008
10	Sense of place	Identity of public places	<ul style="list-style-type: none"> Familiar places Familiar landmarks Familiar people 	
11	Vitality	Publicness of commercial centres		Lynch, 1987; Jacobs, 1961; Heffernan et al., 2014

Table 2: Table showing relevant parameters, sub-parameters and variables related to the liveability of transformation of commercial centres with respect to the process of urban development. (2022)

2022). This is determined by the distance, the time taken to reach and the options for different modes of transport from neighbourhoods (Heffernan et al., 2014; Ghazi and Abaas, 2019; Istrate and Chen, 2022). There has been a reduction in footfall in the Star Mall Kolkata and TDI Mall Rajouri Garden since their inception, primarily due to their location, which is on the outskirts of the city fabric. Other factors, such as a lack of connectivity and continuity of public space, have gradually reduced their attractiveness. This has also led to a decrease in safety in the area.

"Successful public space is easy to get to and get through; it is visible both from a distance and from up close" (Karami et al., 2015). The characteristics of liveable streets include familiarity between people "because they spend time out-of-doors, thus creating a sense of community and belonging" (Bosselmann, 2012).

Public spaces are liveable if people feel safe to perform their activities. According to urban design theory, natural surveillance (Jacobs, 1961, Istrate and Chen, 2022), "reduced setbacks, night lightings, front porches, natural surveillance and active land use" (Tiwari, 2015) contribute to safety. Moreover, mechanical surveillance—using artificial lighting and surveillance cameras—and passive or natural surveillance—via the presence of active frontages, façade opening ratios and activity—ensure safety (Tiwari, 2015). Fine-grain urban form, presence of pedestrian priority areas, integration of lower economic areas, presence of informal vendors, increasing passive surveillance and territoriality correspond to an increase in the safety of public places in and around commercial centres (Tiwari, 2015). Big-box mall typologies often lack continuity of active frontages in urban forms, which is contrary to the character of Indian cities. This lack of continuity has caused safety issues and increased atrocities, as reported around malls such as Saket City Centre in New Delhi. The health, cleanliness and orderliness of city centres are crucial aspects for consumers in cities of the Global South. The advent of the pandemic has stressed this aspect. A summary of the recurring sub-parameters and their related variables for the liveability parameter is provided in Table 2.

2.2.3. Sense of place

Sense of place is defined as “the psychological and emotional dimensions of living in a neighbourhood, on a street, in a building”. In urban design, sense-of-place designers first associate it with spatial definition and characteristics (Bosselmann, 2012).

For commercial centres and marketplaces, physical parameters such as street width, building height and building front offset are considered quantitative factors. The urban form is perceived through its edge and shape (Thwaites et al., 2020). In Kolkata, the redevelopment of the Barnaprichay Market transformed a low-rise marketplace into an introverted high-rise mall within a compact, low-rise urban fabric. This transformation resulted in a segregated development pattern. Parameters such as diversity, vitality, accessibility, safety and distinctiveness contribute to the experience of a sense of place. Six tangible parameters that influence the image of public spaces like shopping

areas are location, access, parking, ambience, retail offer, leisure offer and facilities (Mandeli, 2019). Furthermore, malls in India should implement community programmes that engage them in meaningful, qualitative and socially relevant activities (Sahu, 2016).

Enhancing the sense of place increases the safety of the area, which can be facilitated by the presence of both natural and mechanical surveillance (Mehta, 2008). Visibility is measured by distance, height and angle. The presence of vista, skyline and obstructions (Caprotti, 2019) affects visibility. Urban edges, along with activities and users, urban floorscape and urban furniture, were used to understand the physical factors for comfortable public spaces (Mehta, 2008; Mandeli, 2019; Nambuge et al., 2020). Legibility is defined as “the ease with which its parts can be recognised and organised into a coherent pattern” (Lynch, 1987, p. 60). Additionally, this quality enhances the perception of a sense of place. Gurugram’s Raheja Mall, Grand Venice Mall,

Sub-parameters and variables for sense of place				
	Sub-parameters	Broad requirements	Variables	Authors
1	Location	Position of the commercial centres	– Distance from the neighbourhoods	Christaller, 1933; Lösch, 1954; Ghazi and Abaas, 2019
2	Accessibility	Ease of access	– Types of roads – Activities on roads	Teller and Reutterer, 2008; Mandeli, 2019
3	Diversity	Multiple activities and engagements		Jacobs, 1961; Teller and Reutterer, 2008; Istrate and Chen, 2022
4	Vitality	Publicness of the urban space		Mandeli, 2019; Istrate and Chen, 2022; Li, 2022
5	Safety	Safe conditions for all visitors		Carmona, 2019; Nambuge et al., 2020
6	Urban form	Easy to identify and locate	– Edge – Shape of the urban area – Street width – Height of the buildings – Building front offset	Jacobs, 1961; Montgomery, 1998; Thwaites et al., 2020 Mehta, 2008; Mandeli, 2019; Nambuge et al., 2020
7	Parking	Sufficient parking spaces for different vehicles	– Number of parking spaces – On-street parking – Entries and exits for parking	Teller and Reutterer, 2008; Mandeli, 2019
8	Ambience	Comfort and safety conditions	– Positive ambience – Negative ambience	Jacobs, 1961; Gomes, 2017 Carmona, 2019
9	Visibility	Visual accessibility	– Distance of visibility – Width of the road – Height of visibility – Presence of visual obstruction (trees, placards and façades under obstruction) – Vista and skyline	Jacobs, 1961; Mehta, 2008; Mandeli, 2019; Caprotti, 2019; Nambuge et al., 2020
10	Quality of open spaces	Vibrancy and activity patterns in open spaces		Jacobs, 1961; Carmona, 2019
11	Imageability	Identity of public places	– District – Edge – Node – Pathways – Landmark	Lynch, 1987; Jacobs, 1961; Carmona, 2019
12	Legibility	Urban pattern Cohesiveness	– Colour – Spaces for fun	Lynch, 1987; Jacobs, 1961 Montgomery, 1998
13	Emotional parameters	Sense of belonging Personal characteristic		Teller and Reutterer, 2008

Table 3: Table showing relevant parameters, sub-parameters and variables related to the sense of place of transformation of commercial centres with respect to the process of urban development. (2022)

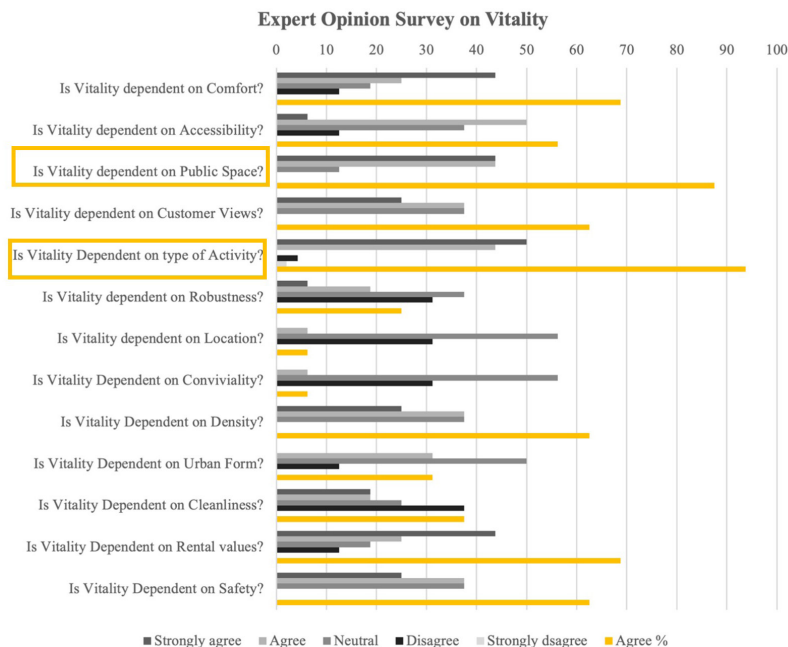


Figure 1: Graphical representation of the five-point Likert scale evaluation from expert opinion on vitality. (2023)

Faridabad and TDI Mall Rajouri Garden have all been victims of having introverted and exclusive urban forms that are non-coherent with the surrounding urban fabric. The scale and architecture of the buildings were modernised and the public realm was undeveloped, thereby creating a lack of sense of place. This issue has deterred people from accessing the mall. These malls have eventually declined due to low footfall and poor business. A summary of the recurring sub-parameters and their related variables for the sense of place parameter is provided in Table 3.

2.3. Formulation of a theoretical framework

In the third stage, an expert opinion survey was conducted to derive the relevant parameters, sub-parameters and variables that influence the transformation of commercial centres with respect to the process of urban development in a city. A list of questions for each parameter was distributed to 16 experts from the fields of urban design, architecture and real estate to determine the critical sub-parameters that influence the transformation of commercial centres with regard to urban development. A five-point Likert scale was used to evaluate the responses, and 75% agreement was considered to obtain the relevant sub-parameters for the transformation of shopping centres. The results are presented in the following section.

3. Results

The following tables (Table 1, Table 2 and Table 3) of sub-parameters and variables were generated for each of the three parameters based on a literature study.

A questionnaire was created based on the above lists (Table 1 for vitality, Table 2 for liveability and Table 3 for sense of place) to derive the theoretical framework. The questionnaires, along with the results of the respective expert opinion surveys, are presented in Figures 1, 2 and 3.

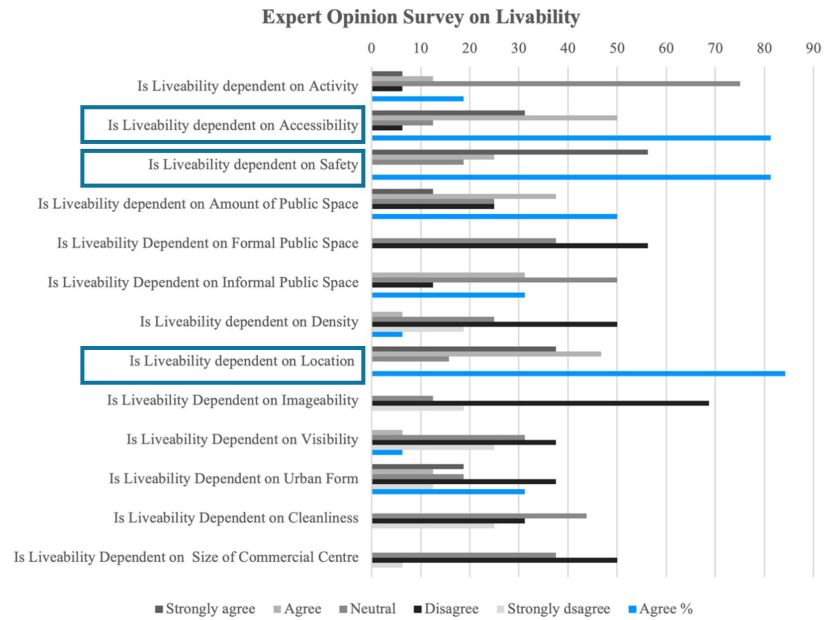


Figure 2: Graphical representation of the five-point Likert scale evaluation from expert opinion on liveability. (2023)

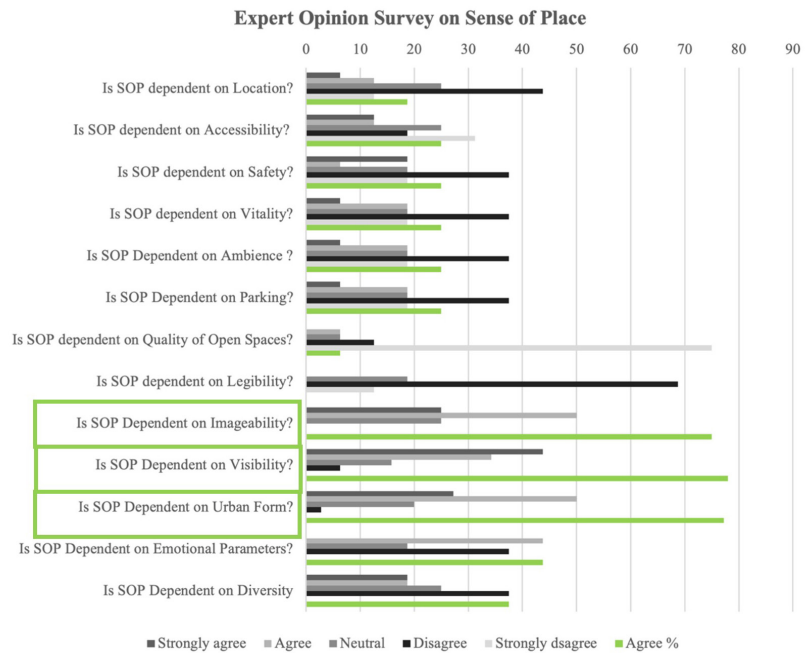


Figure 3: Graphical representation of the five-point Likert scale evaluation from expert opinion on sense of place. (2023)

4. Discussion and conclusions

An analysis of the findings from the above data is presented below to formulate a theoretical framework for understanding the transformation of commercial centres with respect to the process of urban development.

4.1. Vitality

Based on the survey results (Figure 1), the relevant sub-parameters and their corresponding variables are presented in Table 1. The implication for each sub-parameter is discussed below.

Activity: The measurement of activity involves understanding the type of activity and the number of people engaged in it. Pedestrian flow is considered the most common determinant of publicness generated by an activity.

Public Space: The presence of formal and informal public spaces is necessary.

Based on these implications, the following guidelines are provided for Indian commercial centres:

- A suitable mix of commercial activities catering to local demand must be ensured to attract footfall.
- Formal and informal activities and public places should be considered for designing Indian commercial centres.
- The extent of commercialisation should be monitored by regulating the amount of building use dedicated to commercial activity, especially in the zonal and neighbourhood areas of the city.

4.2. Liveability

Based on the survey results (Figure 2), the relevant sub-parameters and their corresponding variables are presented in Table 2. The implication for each sub-parameter is discussed below.

Location: The size and distance of commercial centres at the city level must be consciously regulated.

Accessibility: Accessibility is measured by the distance and time taken to access from neighbourhoods, both quantitatively and qualitatively, by evaluating the types of pathways and modes of transportation used by customers.

Safety: Safety, regulated by mechanical surveillance and passive or natural surveillance, requires more focus, as shopping malls in India often lack active frontages, pedestrian priority pathways and cohesive urban spaces.

Based on these implications, the following guidelines are provided for Indian commercial centres:

- Ease of accessibility should be prioritised to ensure a regular flow of users for the commercial centre.
- Pedestrian linkages should be prioritised in all scales of Indian commercial centres.
- Commercial building typologies should have active shop fronts, especially on the ground floor, to ensure safety.

4.3. Sense of place

Based on the survey results (Figure 3), the relevant sub-parameters and their corresponding variables are presented in Table 3. The implication for each sub-parameter is discussed below.

Urban Form: A relevant urban form is required to address the complexity of the Indian urban fabric and reduce the production of segregated commercial spaces.

Visibility: The visibility of Indian commercial centres should be prioritised to ensure visual cohesiveness and attractiveness, a lack of which is leading to increased vacancy in Indian malls.

Imageability: An image of a typical Indian commercial centre must be established, rather than copying Western shopping malls, to instil a sense of belonging among users.

Based on these implications, the following guidelines are provided for Indian commercial centres:

- Contextual urban design guidelines for the urban form must be formulated to maintain urban continuity.
- The height of commercial centres and the front open space should be more than that of the surrounding areas and should be determined at the zonal level within each city.
- Local architectural features should be incorporated in commercial buildings to maintain cultural continuity.

Accordingly, Figure 4 illustrates the theoretical framework necessary to assess the transformation of commercial centres with respect to the process of urban development within a city.

5. Recommendations

The drastic expansion of cities due to polycentric urbanism has led to multiple commercial hubs and an uncontrolled commercial footprint in the retail sector of cities in the Global South. The transformation of commercial centres from traditional markets to shopping malls has resulted in incoherent urban spaces. Indian cities are facing

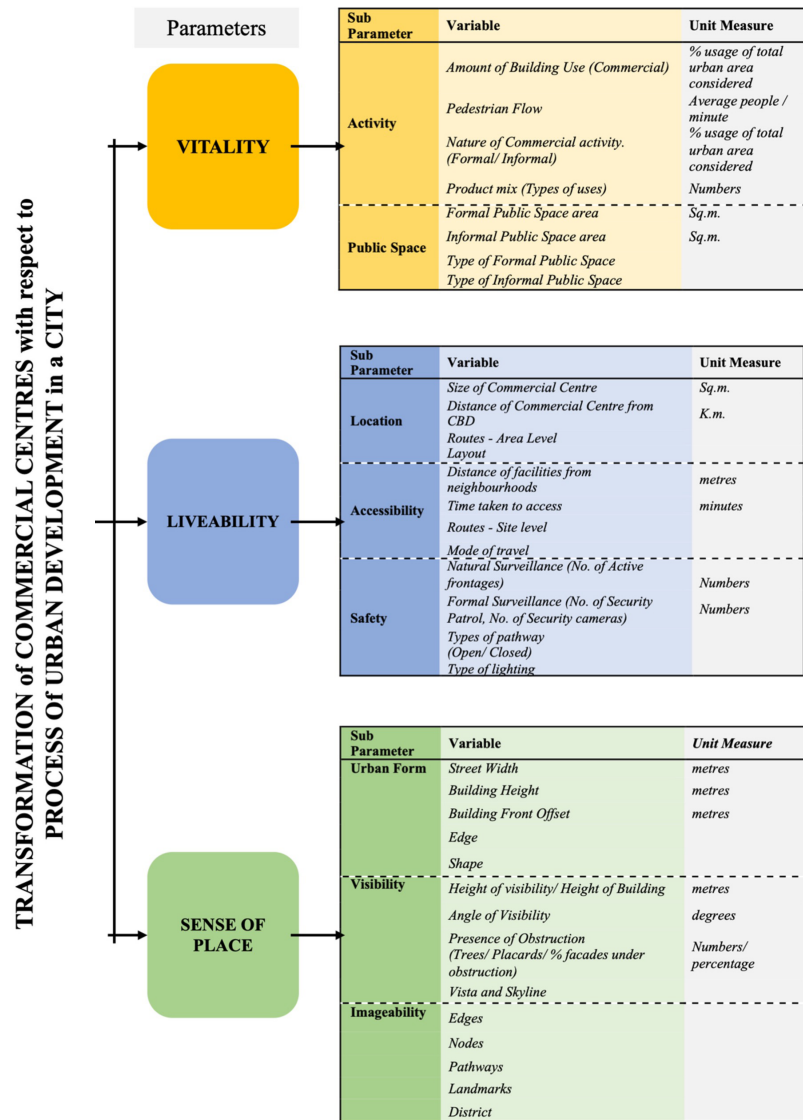


Figure 4: The theoretical framework for studying the transformation of commercial centres with respect to the process of urban development in a city. (2023)

a similar transformation at a rapid pace, creating disintegrated urban spaces around traditional commercial centres and new typologies, such as shopping malls.

Based on the conclusions of this paper, some recommendations are provided to transform such commercial centres into thriving public places. First, the transformation of commercial centres is influenced by three main parameters: vitality, liveability and sense of place in a city. These parameters should be used to formulate relevant urban policies and create the required, vibrant commercial centres with respect to urban development in Indian cities. Second, the link between commercial activities and public spaces should be thoroughly assessed for maintaining overall vitality. Third, the liveability of commercial centres is determined by the variables of location, accessibility and safety. These are the pivotal considerations that collectively shape the overall viability and integration of commercial centres within the broader urban fabric. Fourth, there is a loss of sense of place, especially in new commercial centres.

The significance of evaluating physical parameters that define urban form, such as street width, building height and building front offset, helps maintain a sense of place. Finally, assessing these factors would help in the production of necessary commercial spaces and reduce gaps in the urban fabric due to the creation of ghost malls.

In the future, undertaking necessary corrective interventions in similar situations would be beneficial to guide them in the desired direction. Additionally, developing anticipatory plans with alternative proposals for similar situations would help generate cohesive urban development patterns in Indian cities.

Conflict of Interests. The authors declare no conflict of interests.

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