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Investigating Transformation of Commercial Centres in Sub-Urban Towns: Identifying Related Parameters & Sub-Parameters

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Abstract: ***Transformation, in the context of this research, is the process of spatial change of a certain place over a period of time. It is an inevitable phenomenon in the study Urban Design, which is the change of an urban setup with respect to time, mostly attributed to urbanization. Commercial Centres are one of the important public space in an urban settlement where people interact and meet beside the exchange of goods being the primary activity. It has been found that the Transformation of Commercial Centres in Sub-Urban Towns has created a significant impact on the overall spatial fabric in and around the developed states. Transformation of Commercial Centre in Sub-Urban Towns are high time to study because these changes are taking place in a much unplanned manner with the advent of national and international franchises, e-commerce, Shopping malls and multiplexes to penetrate in sub-urban towns. It has also become evident, that in these developed states like West Bengal, these Transformation have been largely uncontrolled, sporadic and piecemeal in nature, creating haphazard and chaotic spatial and physical environment. In this perspective, the research work would be continued to identify and establish the related Parameters & Sub-Parameters, on basis of what, further field study would be carried out to capture the Transformation of Commercial Centres in Sub-Urban Towns of West Bengal.***

Keywords: Transformation, Commercial Centres, Sub-Urban Towns, Sense of Place, Vitality, Permeability.

I. INTRODUCTION

A. Background

Transformation can be defined as the systematic change in inherent functioning. In Sub-Urban Towns the Commercial Centres accommodate more functions like service, public culture and administration beside the commercial exchange into this area. The Transformation often turn towards the chaotic development if not controlled and intervened. However, in Sub Urban Towns of West Bengal, these interventions so far have failed to address the situation properly. In this perspective the said research work would be undertaken and the attempt would be made to formulate the specific guidelines and recommendations for systematic Transformation in a consecutive and integrated manner. Fig 1 shows the result of planned intervention for Transformation process.

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Figure 1: Singapore cityscape, then & now. Source: Google image, 2023

B. Objectives

The research objectives are as follows:

OBJ.1. To study The Transformation of Commercial Centres in Sub Urban Towns of West Bengal.

OBJ.2. To establish the relationship between Transformation of Commercial Centres and Sub Urban Towns based on this study.

OBJ.3. To identify responsible parameters & sub parameters for the phenomenon.

OBJ.4. To establish inter-relationship between Parameters & Sub-Parameters.

C. Methodology

The 5 basic stages of the methodology adopted so far are as follow:

- The first stage would give the introduction of the subject matter of the research work, primarily establishing its Background, Objectives and Methodology.
- The second stage would theoretically define the important aspects of the research work, namely, Transformation, Commercial Centres and Sub-Urban Towns.
- The third stage would establish their relationship on the basis of literature study from an Urban Design viewpoint.
- The fourth stage would identify parameters and sub parameters triggering these Transformation of Commercial Centres in Sub Urban Towns.
- The fifth stage would establish parametric relationships and determine the quantifiable indicators of the same.

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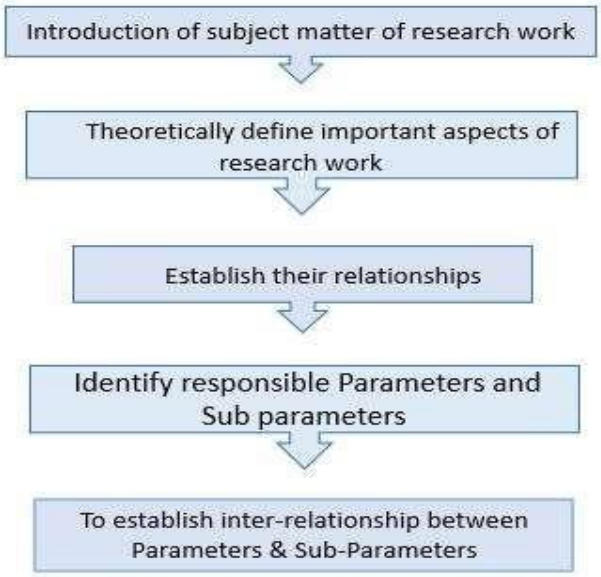


Figure 2: Developed Methodology. Source: Author

D. Scope

The scopes of the research are:

- Understanding the decentralization of commerce from city to Sub-Urban Towns.
- Identifying the factors influencing the Transformations of Commercial Centres in the context of SubUrban Towns.
- Deriving methods to improve the existing Commercial Centre with the help of the understanding of the place and the space.
- Predicting the effectiveness of the Commercial Centres of Sub Urban Towns of West Bengal and developing guidelines compatible to the context.

E. Limitation

The research will be limited to:

- The spatial/physical transformation would only be considered.etc.
- The Transformation of Commercial Centres would be considered only with respect to Sub-Urban Towns.
- The Urban Design viewpoint of research would only be considered.

II. LITERATURE STUDY

A. Transformation

Transformation can be defined as systemic changes in inherent functioning. Transformation is essentially changes of space and time which generates adaptation. Adaptation creates domination, which with time gives rise to Transformation. [1] Transformation is true both in macro scale, i.e. global, economic, political and social structures, and also at micro level, i.e. the way in which people fashion their everyday lives. [2] First- and secondtier cities now primarily expand and construct through urban renewal and Transformation, which provides a means of transitioning and the improvement of land use efficiency. Urban revitalization and transformation are being applied to different land parcels, each with unique but essentially comparable driving dynamics. [3] The urban intervention is needed with the aim so that the Urban Transformation could provide sufficient socio-cultural, spatial and infrastructure support for the development in the state or sub-region or country. [4] Research on Urban Transformation encourages communication between inter-and trans-disciplinary studies on urban change and sustainability transitions theory. [5] A better understanding of the role of underlying factors, which lead to Transformation of a place is always necessary to cope with the constant changes. Sometimes urban intervention becomes indispensable, to guide this Transformation towards futuristic development goals. Planned intervention leads the Transformation towards positive results as seen in Fig.3, a seafront of Portugal Transformed into a pedestrian friendly, public realm.



Figure 3: Seafront Transformation at Portugal. Source: Google Image, 2024

B. Commercial Centres

Commercial Centres can be defined as place of business, exchange interaction. Commercial Centres mean a group of contiguous lots organized into a shopping center, strip mall, Business Park, office condominium or similar grouping that share mutual access, ingress and egress easements. Commercial Centres can be classified as: Local, Regional, National, and International. Commercial Centres, over centuries, has been consolidated and has attained concrete form by means of a network: a network of buying and selling- points in the case of exchanging commodities, of labour exchanges in the case of labour market and so on. [6] Even though trade and commerce have advanced due to E-transactions, traditional Commercial Centres continue to be important for modern business operations and urban environmental management. The majority of economic activity, especially in developing nations, either starts or ends at Commercial Centres.[7] The key concern is expressed about the future of Commercial Centres that people are having short attention spans.[8] The location of Commercial Centres are greatly influenced by decision criteria. A different study could create a new structure with additional criteria and sub-criteria and evaluate alternatives.[9] Commercial Centres can be characterized by, diverse commercial activities and transactions, high value of land with predominant commercial zoning and mixed use developments, centralized location with greater connectivity links. Besides providing essential goods and driving the economic growth these Commercial Centres promote community bonds. Attractive plazas, public places for community interactions often demarcate as some of the important landmarks in these Commercial Centres, which may vary in terms of scale from a neighborhood commercial strip to regional or global financial district, thereby serving as indicator of the overall urban growth.



Figure 4: Ancient Commercial Center, Roman Forum. (Source: Encyclopedia Britannica, 2023)

Figure 5: Royales Saint Hubert, Classic Shopping Centre, Brussels, Belgium. Source: Google Image, 2024

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C. Sub-Urban Towns

Sub Urban Towns are Medium Towns (as per URDPFI Guidelines) away from Urban Agglomeration.

S.No.	Classification	Sub-category	Population Range	Governing Local Authority	Number of Cities as per Census of India, 2011
1	Small Town*	Small Town I	5,000 - 20,000	Nagar Panchayat	7467
		Small Town II	20,000- 50,000	Nagar Panchayat/ Municipal Council	
2	Medium Town	Medium Town I	50,000 to 1,00,000	Municipal Council	372
		Medium Town II	1 lakh to 5 lakh	Municipal Council	
3	Large City	--	5 lakh to 10 lakh	Municipal Corporation	43
4	Metropolitan City	Metropolitan City I	10 lakh to 50 lakh	Municipal Corporation/ Metropolitan Planning Committee	45
		Metropolitan City II	50 lakh to 1 Crore	- Same -	5
5	Megapolis	--	More than 1 Crore	- Same -	3

Figure 6: Classification of Urban Settlement. Source: URDPFI Guidelines

The United Nations in 2019 estimated that India will to surpass China as the world's most populous country by 2027. Also, India's urbanization is poised to accelerate in the coming decades. During 2011–36, urban growth will be responsible for 73% of the rise in total population. [10] A suburb's urbanization shouldn't be equated with the complete erasure of its suburban identity if, suburban space represents the potential for spatial–social change over time and the pervasiveness of diverse activities within an extended urban region. [11] In India, less research has been done on Sub Urban Towns. Growing suburbs away from the city are a defining feature of Indian urbanization today. [12] The urbanization of Sub Urban Towns shouldn't be equated with the complete erasure of its suburban identity if, the place represents the potential for spatial–social change over time and the pervasiveness of diverse activities within the region. Indian urbanization patterns are changing, moving away from metropolitan domination and toward new urban growth in Sub Urban Towns. The reason for this is the diversification of employment away from agriculture brought about by the expansion of transportation infrastructure, the reinvestment of agricultural surplus in non-farm ventures, haphazard construction in Sub Urban Towns. [13]

D. West Bengal

West Bengal, erstwhile known as Bengal has been the part of International Business Network since 6th Century. West Bengal, previously known as Banga and Pundravardhana, along with Anga, Kalinga and Sumba, were two of Shorosho Mahajanapada. This region had been the province for Portuguese and French Colony as well. Even after the partition and Independence, West Bengal has been the nodal point to connect North-East Region of India. The pattern of unplanned urban growth of the towns/cities of West Bengal are poorly studied or not even documented except for the Kolkata Metropolis. [14][15] Along with the gradual increase of urban population, urbanisation of West Bengal is also linked with the transformation of land use, economic activities and cultural attributes. [16] Micro, Small and Medium Enterprises in West Bengal which have an important role to play in the Indian economy also due to its greater resource, capacity for employment generation, technological innovation, promoting inter sectoral linkages, raising exports and developing entrepreneurial skills. [17]

E. Transformation Of Commercial Centres In Sub-Urban Towns

Commercial Centres in Sub Urban Towns has evolved from a location for purchasing to a place for social interaction, dining, meeting, and exercising. [18] The main characteristics of urban area is retail. Among this, one of the most innovative ideas in retail are Commercial Centres. [19] Along with the gradual increase of urban population, urbanization is also linked with the transformation of land use, economic activities and cultural attributes. [20] The nature of the leading commodities and local marketplaces have historically influenced the paths of urban growth. [21] Commercial Centres in Sub Urban Towns has evolved from a location for purchasing to a place for social interaction, dining, meeting, and exercising. [22] The privatization of public space may go hand in hand with this process of Transformation of Commercial Centres. Consumers roam about in sections with a semi-public feel after entering through easy-to-control narrow entrances.[23] Sub Urban Towns retained a better status than the city, were more prone to Transformation, and experienced higher frequencies of status improvement despite the heightened discourse surrounding suburban decline and poverty. Across all decades, the majority of Sub Urban Towns had the top status position.

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The situation of Sub-Urban Towns are depicted in the pic 7 & 8, Kanchrapara commercial centre and Wednesday market at Raiganj respectively. The Transformation of Commercial Centres in Sub Urban Towns which converts urban places into malls without the need for new construction or developers, was first described by Margaret Crawford in reference to the pressure that Commercial Centres in Sub Urban Towns were putting on inner cities. [24] Transformation of Commercial Centres actually attracts new land uses and user to the proximity of Commercial Centre and at the same time repeal the old sets from it for benefit or profit maximization. [25] Transformation of Commercial Centre in Sub-Urban Towns with the potential of the outlet market influences investments to big commercial units, e.g. malls or supermarkets, chains of stores usually set up by transnational companies. [26]



Figure 7: Kanchrapara Commercial Centre. Source: Author,2024



Figure 8: Wednesday Market at RAiganj. Source: Author, 2024

III. IDENTIFICATION OF PARAMETERS & SUB-PARAMETERS

A. Identifying Parameters

Transformation of Commercial Centres is most important because retailing activity evokes a Sense of Place which impose a strategic emphasis on developing country like India. [27] Commercial Centres in Sub Urban Towns has evolved from a location for purchasing to a place for social interaction, dining, meeting, and exercising, which evokes a Sense of Place. [28] Physical Element like built form and social variable like human activity are the determinants of a Commercial Centre's identity and both of them can contribute to the Sense of Place. [29] Therefore Sense of Place affects Transformation of Commercial Centres in Sub-Urban Town.



Figure 9: City Centre 1, Sense of Place evoked by the activity. Source: Author

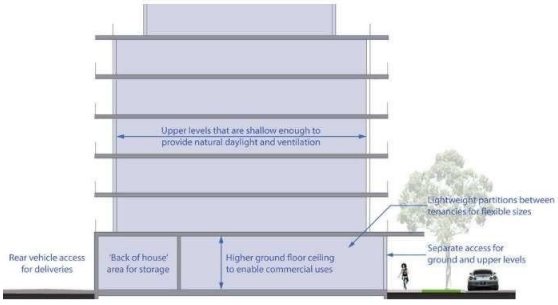


Figure 10: Mixed Use commercial Street setup Source: Google Image

The community and ancestral ties to a place i.e. Sense of Place in a Commercial Centre in Sub-Urban Towns should not get hampered in terms of activity with the process called Transformation. [30] [31] Specific physical characteristics, built form, of a Commercial Centre in Sub-Urban Town, is a relevant factor to Sense of place of that particular set up. [32] So Sense of Place could be identified as one major parameter.

Due to the difference in the direction of spatial Configuration w.r.t. Vitality, Transformation of Commercial Centres were found to have taken place freely, further indicating people's democratic spaces in business. [33] People's movement add to the vitality of a Commercial Centre in Sub-Urban Towns. [34] A Commercial Centre's aspects of movement, and spatial Configuration including well-maintained sidewalks, patio eating, and landscaping enhances its vitality. [35] The movement in and around the Commercial Centre, located in Sub-Urban Towns is a key factor to investigate the place's vitality. [36] The spatial configuration in terms of land use distribution reflects social, economic and physical environment of, Commercial Centres in Sub-Urban Towns and relates to vitality. [37]

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Figure 11: Pondy Bazar, Before transformation. Source: Author



Figure 12: Pondy Bazar, After transformation. Source: Author

Shops and eating establishments offer accessible through site links to laneways and courtyards, adding to the permeability of the Commercial Centre in Sub-Urban Town. [38] Greater permeability of the blocks in Commercial Centre ensures the social interaction between interiors and the public spaces outside, thus ensuring safety and security of the place. [39] Designing a Commercial Centre with a safe and secure environment has become crucial due to the increased vulnerability to crime. In Sub-Urban Towns, it is necessary to have accessible entrances in order to preserve integration and permeability inside the town centre. [40] So finally three numbers of Parameters have been found most relevant for studying the Transformation of Commercial Centres in SubUrban Towns are: Sense of Place, Vitality and Permeability.

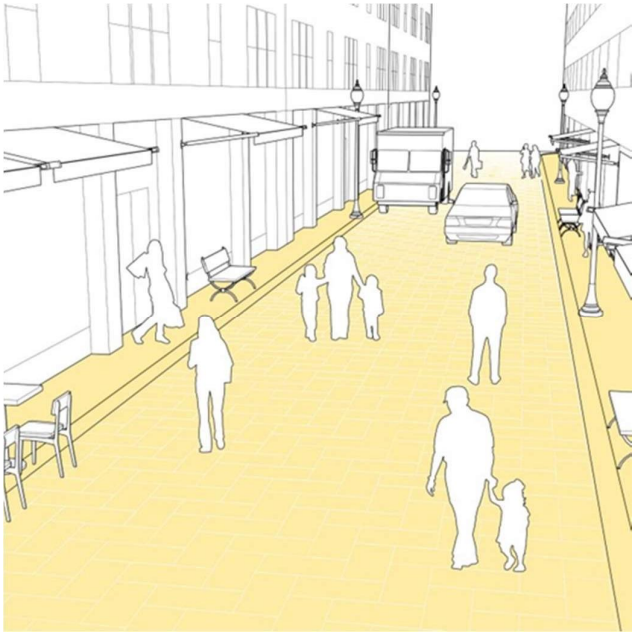


Figure 13: Permeable Commercial Street Source: NACTO Urban Street Design Guide

B. Identifying Sub-Parameters & Variables

The Sub-Parameters are initially found from literature study. Initially 6 Sub-Parameters have been found with their variables and presented in a tabular format. For Sense of Place the Sub-Parameters and their Variables are as follows:

Sr. No	Sub-Parameter	Broad Requirement	Variables for Measurement	Key Reference

1	Legibility	Mental map clarity, Distinctive district edge	Ease of way finding; Distinctive nodes, Contrast between the centre and surroundings	[41] [42]
2	Built Form	Familiarity, Physical attributes	Height of the building, Architectural features	[43] [44] [45] [46]
3	Identity	Unique visual character	Use of local materials/vernacular styles	[47]
4	Imageability	Quality of physical objects	Frequency of "Insta-worthy" or iconic spots	[48]
5	Activity	Public engagement, Location, current use of the buildings	location, Built use	[49] [50]
6	Comfort	Environmental quality	Thermal comfort; Noise levels; Perceived safety	[51]

Table 1: Identified Sub-Parameters and Variables of Sense of Place. Source: Author

For Vitality Parameter the same kind of set of Sub-Parameters & Variables have been identified. They are as follows:

Sr. No	Sub-Parameter	Broad Requirement	Variables for Measurement	Key Reference
1	Footfall	Volume of pedestrian flow	Pedestrians per hour (peak/off-peak)	[52]
2	Diversity	Mix of land uses/tenure	Primary use vs. secondary use ratio	[53]
3	Movement	Movement of different mode along the site	Pedestrian movement, Vehicular movement, Mode of movement	[54] [55] [56]
4	Affordability	Range of price points	Presence of informal trade vs. luxury retail	[57]
5	Space	Quality of space, value of the land/buildings increases or decreased	Pattern, Grain, Texture, Land value	[58] [59] [60]
6	Robustness	Multi-functional spaces	Variety of activities in a single location	[61]

Table 2: Identified Sub-Parameters and Variables of Vitality. Source: Author

Finally the identified Sub-Parameters and Variables of the Parameter Permeability are as follows:

Sr. No	Sub-Parameter	Broad Requirement	Variables for Measurement	Key Reference
1	Connectivity	Frequency of intersections	Link-node ratio; Intersection density	[62]
2	Granularity	Size of urban blocks	Average block perimeter (m); Plot widths	[63]
3	Inclusivity	walkable public transport hub, Universal access	walkable public transport hub, Universal access	[64] [65] [66]
4	Porosity	Ratio of open to closed edges	Number of building entrances per 100m	[67]
5	Safety	Crime and accident frequency, Natural surveillance	Crime rate, Accident rate, Lighting, Surveillance	[68] [69] [70]
6	Visibility	Sightlines within the center	Visual integration (Space Syntax); Isovist area	[71]

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Table 3: Identified Sub-Parameters and Variables of Permeability. Source: Author

C. Establishing Parameters, Sub-Parameters & Variables

On the basis of the literature study to identify Parameters, Sub-Parameters and Variables, another literature search has been taken into consideration where in different cases the previously identified Parameters have been affected and took the Transformation towards the positive or negative impact in those places.

Sr. No.	Author/s	Context	Key Observation	Intervention	Parameter affected/improved	Outcome
1.	[72]	Cities of Romania	Globalization/liberalization of the market accelerated the Transformation. Proximity to highway or railway terminal accelerate the Transformation.	No, Organic growth	Vitality -Movement increases without control. -Spatial configuration in terms of land use change.	-ve
2.	[73] [74]	Sub-Urban Town of Tiaret in Algeria, 3 cases from New York state.	Municipal Authority maintained the rhythm with rapid urban growth. Increased Tertiary activity mainly along the transit road makes commercial Centre grow towards positive direction. Existing system, when loses resilience the intervention of participatory planning is indispensable.	Intervened with respect to providing the basic infrastructure & services	Sense of Place -Activity improved with diversity. -Density remained under control. Permeability -personal safety and surveillance enhanced	+ve
3.	[75]	Sub-Urban Growth in China.	Land use transformation to nonagricultural or commercial type lead the transformation economically efficient, socially just and environmentally sustainable.	Intervention during land-use transformation policy	Vitality -Increased pedestrian and traffic flow movement -Controlled land use change Permeability -ensured with affordable price of land, eventually increases accessibility	+ve
4.	[76]	Karbala city in Iraq.	Heritage/historical structures add to the Sense of Place and researched demolition for the sake of Transformation loses the space's identity.	Intervened with conservationist	Sense of Place -Historic Built form retained. -Importance to optional religious activity.	+ve

5.	[77] [78]	Kolkata, CBD of Dar-es-Salam, Tanzania.	Traditional Indian markets should not become obsolete with the forces of Transformation. Inclusive development is proposed. Transformation with control and monitoring can lead to positive outcome.	Intervention proposed	Vitality -Land use change needs control, Sense of Place - uncontrolled increase in density affects the sense of place.	-ve
6.	[79]	Different precinct of Newcastle city, Australia	Understanding of the resilience of the place to control the forces of urbanization for positive growth.	Evaluation of Interventions	Vitality -Spatial Configuration for better resilience needed to monitor continuously.	+ve
7.	[80]	Sub-Urban Towns of Ghana	Shopping malls attracts more investment as well as drive transformation towards growth, but the identity of the place loses with it very much.	No intervention, Transformation driven by market forces	Sense of Place -Social activity spaces compromised for shopping mall - Added up built form increases density	-ve
8.	[81] [82]	Sub-Urban areas around 5 cities of India. Sub-Urban towns in Yola state, Nigeria.	Elected government, traditional authority and civic society should come together for decision making for positive Transformation.	Integrated intervention proposed	Permeability -Cost of living, social inclusivity in terms of accessibility of the place. -Physical safety and surveillance in the place.	-ve
9.	[83] [84]	Sub-Urban towns of India. Sub-Urban Towns in Sweden.	Malls faces a huge competition from smaller shops. Urban design evaluation of the place should come out with the potential of the place.	Commercial Centres, with structured intervention.	Sense of Place -Lack of activity diversity. -Density of built form needed to control.	-ve
10.	[85]	Sub-Urban towns around Northampton, UK.	Hinterland catchment area boundary should be predicted accurately for better positioning of commercial centres	Retail can give Commercial Centre a positive growth	Vitality -Built form density shouldn't be disrupted -lack of Social Activity.	-ve

11.	[86]	Neighbourhood Commercial Centres in Salt Lake	Assessing the attractiveness of the Commercial Centre with respect to transportation and other factors regarding Commercial Centres.	Intervention proposed	Vitality -Better built form & Socially active space proposed. Permeability -security in terms of surveillance proposed.	-ve
12.	[87] [88]	Small towns around Chennai City. Small towns at China.	Identified the gap of lack of interaction among various actors, networks and agents of Transformation. Understanding the Rural-Urban coordination to control the Transformation is very necessary.	Study of Commercial Centres, concluded with structured intervention.	Permeability -safety and affordable cost of land proposed.	-ve
13.	[89]	Sub-Urban areas around Rajsahi, Bangladesh.	Uncontrolled haphazard and unplanned growth.	No Intervention, as per the study.	Permeability -Affordable cost of land increases permeability. Vitality -Land use change should have some policy and vision backup.	-ve

Table 4: Table for Literature Study results to establish the Parameters. Source: Author

On the basis of literature survey the above table (Table 4) provides a comparative analysis of studies related to Transformation of Commercial Centres, mostly contextual to Sub-Urban Towns. The key insights revolve around
contextual drivers, type of interventions, parameters affected and the outcomes. Among the studied literature, in 77.7% cases Transformation has occured without control and intervention, has led to negative direction, in terms of decreased footfall or environmental degradation.
According to the findings some positive Transformation factors are, planned intervention with infrastructure focus, integrated governance and participatory planning, attention to economic, social and environmental balance. There are some negative Transformation factors, such as, Lack of intervention/market driven growth, disregard for socio-cultural identity or built form context and malls overpowering traditional markets, and thus reducing local vibrancy. So this can be concluded that the established relevant Parameters for the present research work are as follows:



Figure 14: Established Parameters. Source: Author

An Expert Opinion Survey designed to find out the most relevant sub-Parameters for each of the selected parameters. The respondents profiling has been done after the capture of data from Expert responses.

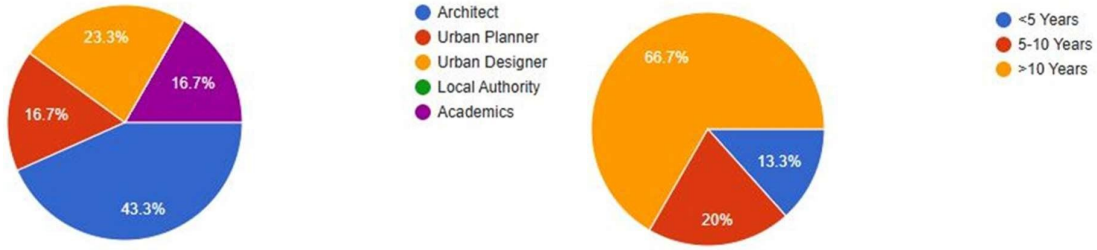


Figure 15: Respondent Profiling, Professional. Source: Author

Figure 16: Respondent Profiling Experience. Source: Author

The responses captured are as follows:

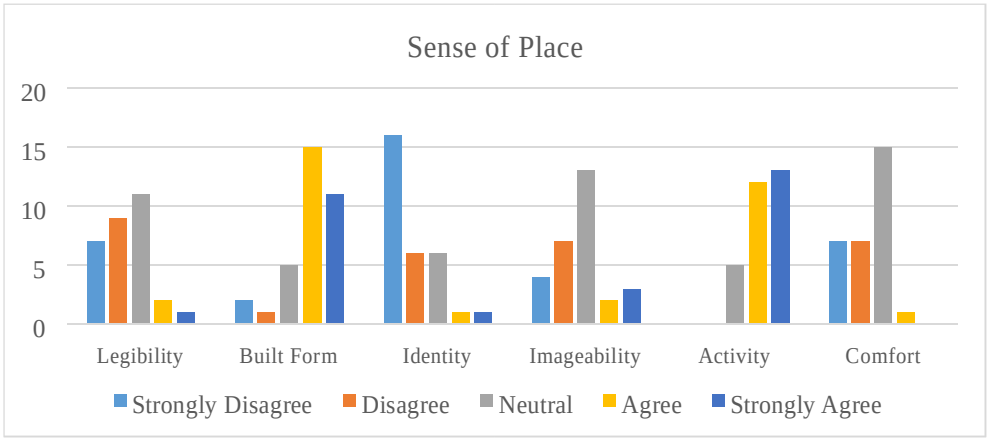


Figure 17: Responses for Sense of Place. Source: EO Survey by Author

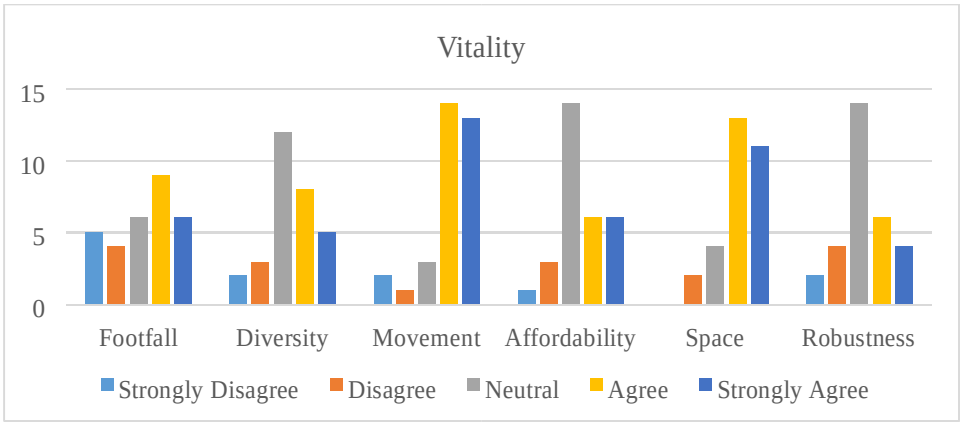


Figure 18: Responses for Vitality. Source: EO Survey by Author

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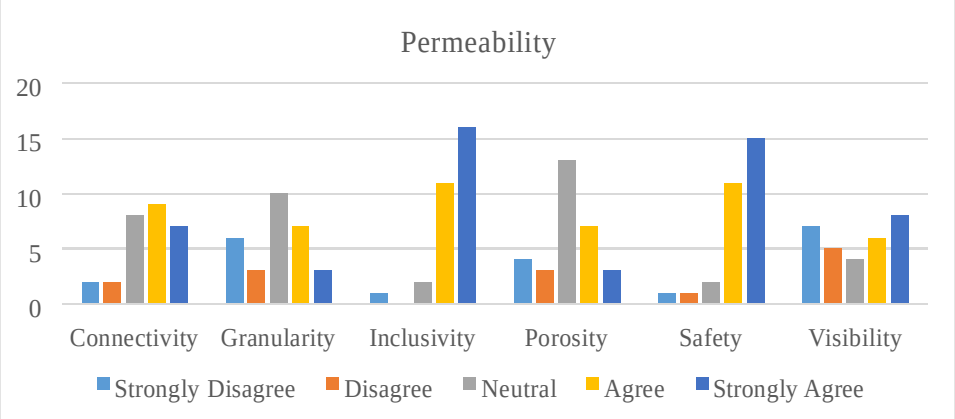


Figure 19: Responses for Permeability. Source: EO Survey by Author

During the capture of data from the responses of the Experts these has been observed:

Sr. No	Question	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Agree (%)
1	Is Legibility a Sub-Parameter of Sense of Place?	23.33	30.00	36.67	6.67	3.33	10%
2	Is Built Form a Sub-Parameter of Sense of Place?	6.67	3.33	16.67	50.00	36.67	**86.67%**
3	Is Identity a Sub-Parameter of Sense of Place?	53.33	20.00	20.00	3.33	3.33	6.66%
4	Is Imageability a Sub-Parameter of Sense of Place?	13.33	23.33	43.33	6.67	10.00	16.66%
5	Is Activity a Sub-Parameter of Sense of Place?	0.00	0.00	16.67	40.00	43.33	**83.33%**
6	Is Comfort a Sub-Parameter of Sense of Place?	23.33	23.33	50.00	3.33	0.00	3.33%

Table 5: Evaluation of Sub-Parameters of Sense of Place. Source: Author

Sr. No	Question	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Agree (%)
1	Is Footfall a Sub-Parameter of Vitality?	16.67	13.33	20.00	30.00	20.00	50%
2	Is Diversity a Sub-Parameter of Vitality?	6.66	10.00	40.00	26.67	16.67	43.34%
3	Is Movement a Sub-Parameter of Vitality?	6.66	3.33	10.00	46.67	43.33	**90%**
4	Is Affordability a Sub-Parameter of Vitality?	3.33	10.00	46.67	6.67	6.67	13.34%
5	Is Space a Sub-Parameter of Vitality?	0.00	6.67	13.33	43.33	36.67	**80%**
6	Is Robustness a Sub-Parameter of Vitality?	6.67	13.33	46.67	20.00	13.33	23.33%

Table 6: Evaluation of Sub-Parameters of Vitality. Source: Author

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Sr. No	Question	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Agree (%)
1	Is Connectivity a Sub-Parameter of Permeability?	6.67	6.67	26.67	30.00	23.33	50.33%
2	Is Granularity a Sub-Parameter of Permeability?	20.00	10.00	33.33	23.33	10.00	33.33%
3	Is Inclusivity a Sub-Parameter of Permeability?	3.33	0.00	6.67	36.67	53.33	**90%**
4	Is Porosity a Sub-Parameter of Permeability?	13.33	10.00	43.33	23.33	10.00	43.33%
5	Is Safety a Sub-Parameter of Permeability?	3.33	3.33	6.67	36.67	50.00	**86.67%**
6	Is Visibility a Sub-Parameter of Permeability?	23.33	16.67	13.33	20.00	26.67	46.67

Table 7: Table 6: Evaluation of Sub-Parameters of Permeability. Source: Author

IV. DISCUSSION & CONCLUSION

Based on an extensive literature review, three primary parameters were established: Sense of Place, Vitality, and Permeability. For each parameter, six potential sub-parameters were identified. To refine this framework, an Expert Opinion (EO) Survey was conducted to select the two most impactful sub-parameters for each primary category.

1) Survey Design: The questionnaire utilized a 5-point Likert Scale, ranging from "Strongly Agree" (5) to "Strongly Disagree" (1).
2) Respondent Profile: The survey targeted a diverse group of professionals to ensure a holistic perspective. The respondent pool consisted of Architects (43.3%), Urban Designers (23.3%), Urban Planners (16.7%), and Academics (16.7%).
3) Experience Level: The expert panel demonstrated high professional standing, with 66.7% having over 10 years of experience and 20% having 5–10 years of experience.

The selection of sub-parameters was determined by calculating the aggregate percentage of positive professional consensus (combined "Agree" and "Strongly Agree" responses).The evaluation for "Sense of Place" sought to identify elements that define the character and human experience of the commercial centre:

- Built Form: Received the highest consensus at 86.67%.
- Activity: Followed closely with 83.33% agreement.

Other sub-parameters like Imageability (16.66%) and Legibility (10%) were excluded due to low expert agreement.
Vitality refers to the "life" and economic health of the commercial hub.

- Movement: Identified as the primary sub-parameter with 90% agreement.
- Space: Selected as the second sub-parameter with 80% agreement.

Footfall (50%) and Diversity (43.34%) showed moderate support but did not meet the top-two threshold.
Permeability assesses the ease of movement and accessibility within the urban fabric.

- Inclusivity: Achieved the highest ranking in this category at 90%.
- Safety: Selected as the second sub-parameter with 86.67% agreement.

Connectivity (50.33%) and Visibility (46.67%) were viewed as less critical by the expert panel in this specific context.
Following the weighted analysis of expert responses, the following parameters and sub-parameters have been finalized for the study of sub-urban towns in West Bengal:

Primary Parameter	Selected Sub-Parameter 1	Selected Sub-Parameter 2
Sense of Place	Built Form (86.67%)	Activity (83.33%)
Vitality	Movement (90%)	Space (80%)
Permeability	Inclusivity (90%)	Safety (86.67%)

Table 8: Established Sub-Parameters for each 3 Parameters. Source: Author

Further the authentication has been reinforced with the following literature references:

Sr no.	Sub-Parameters	Broad Requirements	Variables	Author
1	Built form	Familiarity Physical attributes	Height of the building, Density of built up mass, Street width, Land use pattern	[90] [91] [92] [93] [94] [95]
2	Activity	Public engagement Involvement of people	Activity pattern (Necessary/Social/Optional activity) Pedestrian footfall Active ground floor Social interaction space	[96] [97] [98] [99] [100] [101] [102]

Table 9: Establishment of the Sub-Parameters of Sense of Place with variables. Source: Author

Sr no.	Sub-Parameters	Broad Requirements	Variables	Author
1	Movement	Movement of different mode along the site	Pedestrian movement Vehicular movement Conflict points Mode of movement	[103] [104] [105] [106] [107]
2	Spatial Configuration	Quality of space in terms of linkage, integration, visual connection Volume of blocks	Connectivity Block size Axial integration	[108] [109] [110] [111] [112] [113]

Figure 20: Establishment of the Sub-Parameters of Vitality with variables. Source: Author

Sr no.	Sub-Parameters	Broad Requirements	Variables	Author
1	Inclusivity	Walkability Public transport access Universal access	Walkability index Access to public transport Universal access points	[114] [115] [116] [117] [118] [119] [120]
2	Safety & Security	Crime and accident frequency Natural surveillance	Crime rate Accident rate Lighting Surveillance	[121] [122] [123] [124] [125] [126] [127]

Figure 21: Establishment of the Sub-Parameters of Permeability with variables. Source: Author

So it could be concluded that, the Parameters for the study of Transformation of Commercial Centres in SubUrban Towns of West Bengal are hereby established with their subsequent Sub-Parameters and variables. On the basis of these Parameters and Sub-Parameters, further related on site studies on some Sub-Urban Towns of West Bengal will be carried out in a sequential manner to yield data, which in future, on the basis of subsequent analysis, may lead to the formulation of relevant strategies, recommendations and guidelines in order to highlight the similar Transformation towards desirable direction.

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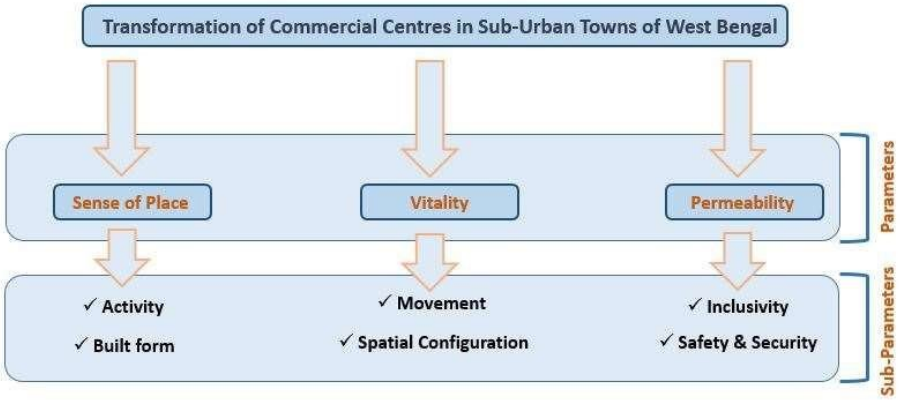


Figure 20: Established Parameters & Sub-Parameters. Source: Author

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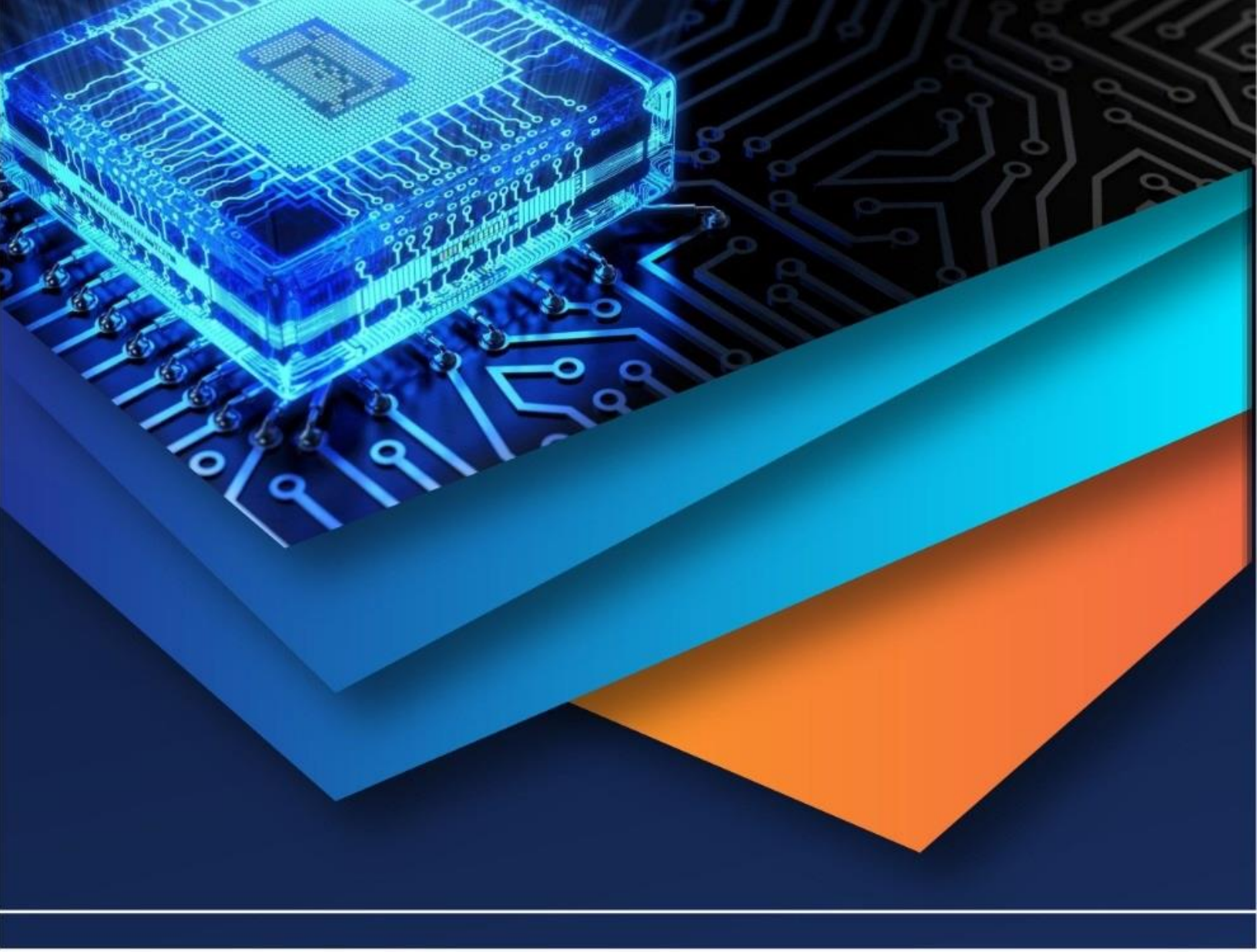
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