HYPERLOCAL URBANISM MODEL - INTERNATIONAL EXPERIENCE

MÔ HÌNH "SIÊU KHU PHỐ" - KINH NGHIỆM THỰC TIỄN QUỐC TẾ

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Abstract: Construction, renovation, and restoration of city ecosystems are always interesting issues for levels of management. Hyperlocal urbanism is a future urban model possible to provide solutions. A qualitative research approach is applied, based on a synthesis of theories on the hyperlocal urbanism model combined with case study analysis to identify the key characteristics of the model, which then serve as a basis for selecting and analyzing the appropriate case studies. Three neighborhood units are selected as representative case studies: Vauban, BedZED, and Les Vergers. The study has identified the key characteristics of the hyperlocal urbanism model, including small-scale area, accessibility to daily essential needs, enhancing community connectivity, prioritization of soft mobility, reducing environmental impact, flexibility and rapid adaptability. Furthermore, the analysis of case studies has shown the effectiveness of applying the hyperlocal urbanism model. In the results and discussion section, a summary table is used to present the solutions and implementation strategies for the key characteristics of the hyperlocal urbanism model applied at the three case study sites, which may serve as a basis for practical urban development projects in the near future and as a foundation for further in-depth research.

Keywords: Hyperlocal planning, local service accessibility, low-carbon mobility, sustainable transportation planning, walkability.

Tóm tắt: *Xây dựng, cải tạo và phục hồi hệ sinh thái đô thị luôn là nội dung được quan tâm ở các cấp quản lý. "Siêu khu phố" là một mô hình đô thị tương lai có thể cung cấp các giải pháp. Nghiên cứu này áp dụng phương pháp nghiên cứu định tính dựa trên việc tổng hợp tài liệu về mô hình "siêu khu phố" kết hợp với phân tích các trường hợp nghiên cứu để nhận diện các đặc trưng cơ bản của mô hình "siêu khu phố" và hiệu quả thực tế đạt được. Các trường hợp nghiên cứu điển hình được chọn là 3 dự án đơn vị ở: Vauban, BedZED, and Les Vergers. Nghiên cứu đã chỉ ra các đặc trưng cơ bản của mô hình "siêu khu phố" gồm quy mô diện tích nhỏ, khả năng tiếp cận đến các nhu cầu thiết yếu hàng ngày, thúc đẩy kết nối cộng đồng, ưu tiên giao thông mềm, giảm tác động đến môi trường, khả năng thích ứng nhanh và linh hoạt. Ngoài ra, phân tích các trường hợp nghiên cứu đã cho thấy hiệu quả của việc áp dụng mô hình "siêu khu phố". Trong phần kết quả và thảo luận, một bảng tóm tắt được sử dụng để trình bày giải pháp và chiến lược thực thi các đặc trưng cơ bản của mô hình siêu khu phố ở 3 trường hợp nghiên cứu. Điều này có thể làm cơ sở cho các nghiên cứu phát triển dự án thực tế trong tương lai gần, hoặc tiền đề cho các nghiên cứu chuyên sâu tiếp theo.*

Từ khóa: *Giao thông phát thải carbon thấp, khả năng đi bộ, quy hoạch giao thông bền vững, quy hoạch siêu khu phố, tiếp cận dịch vụ địa phương.*

I. INTRODUCTION

Mentioning the future of the city, most thinking will be immediately the picture showing a huge city with big and flashy architecture buildings, advanced and up-to-date technologies. However, it is necessary to rethink that the future of cities, which nowadays attracts worldwide attention, originated from small

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and sparsely populated areas, very simple neighborhood units. Currently, many cities in the world have been facing a wide range of issues. The Organization for Economic Co-operation and Development (OECD) has given a recommendation that the best solution for the future of a city does not need to be found out in a vast area encompassing the entire city; it is needed to make a start on a neighborhood unit where residents experience their daily activities. In many countries, many solutions that are put forward to build, renovate, and restore the city ecosystem with the target of creating a good living environment for the future are known, including hyperlocal urbanism. Hyperlocal urbanism is a typical model. Hyperlocal urbanism is a future urban model where residents and their daily living activities are put at the center; in parallel, their life quality is always designed subtly and mindfully.

II. RESEARCH METHODS

This study adopts a qualitative research approach to explore practical experiences in implementing a hyperlocal urbanism model in several representative urban areas. Therefore, the study is based on a synthesis of hyperlocal urbanism model theories combined with case study analysis. First, relevant academic publications, including journal articles, books, and reports, are systematically collected and critically reviewed to identify the key characteristics of the hyperlocal urbanism model. This serves as a foundation for selecting appropriate case studies.

Subsequently, the case studies are neighborhood units selected based on their representativeness and consistency with the results of the previous step. Data for the case studies are obtained from secondary sources such as project documents, project reports, and previous studies. The analysis focuses on the planning framework, implemented solutions, and effectiveness.

This combined approach allows for a comprehensive understanding of the subject by integrating theoretical knowledge with practical evidence. The inclusion of multiple data sources also helps strengthen and enhance the validity.

III. THEORY OF HYPERLOCAL URBANISM MODEL

Hyperlocal urbanism is an urban model that strongly concentrates on a very small scale, namely the neighborhood unit—"the cell of the city," where residents really experience their life, work, play, entertainment, and daily interaction, in which essential needs such as energy, water, food, service… are totally localized within the scale of the local area, closely linked to the characteristics of society, culture, economy, and specific environment of each neighborhood unit, instead of dependence on broader supply systems [1]. Hyperlocal urbanism is closely related to established urban theories while adapting them to contemporary conditions.

Firstly, hyperlocal urbanism has a clear theoretical foundation in the neighborhood unit model proposed by Clarence Perry. This model defines a residential unit within a walkable radius of approximately 400–800 meters, centered around a primary school and supported by basic amenities, aiming to foster self-contained communities and reduce reliance on motorized transport [2]. Hyperlocal urbanism inherits these principles but expands them by integrating localized service ecosystems, digital infrastructure, and sharing economy mechanisms to improve adaptability and real-time responsiveness to users' needs.

Secondly, hyperlocal urbanism shares fundamental characteristics with the compact city model, which promotes high density, mixed land use, and the containment of urban sprawl to optimize infrastructure efficiency and minimize environmental impacts [3], [4]. However, while the compact city operates at the macro scale of the entire urban system, hyperlocal urbanism applies these principles at a micro scale by organizing small, self-sustaining spatial clusters. In this regard, hyperlocal neighborhood units can be interpreted as the "functional cells" that collectively contribute to a compact urban structure.

Moreover, hyperlocal urbanism demonstrates strong conceptual overlap with Transit-Oriented Development (TOD). TOD emphasizes high-density, mixed-use development centered around public transport nodes, prioritizing walkability and reducing dependence on private vehicles [5]. While both approaches aim to enhance sustainable mobility, hyperlocal urbanism focuses more on proximity-based accessibility rather than transit nodes as the primary structuring element. In practice, hyperlocal urbanism can complement TOD by strengthening first- and last-mile connectivity through a distributed network of amenities within walking distance, thereby improving the overall performance of public transportation systems.

In summary, hyperlocal urbanism is not a wholly separate theory but an evolution that builds upon and integrates established models such as the Neighborhood Unit, Compact City, and Transit-Oriented Development (TOD). Its distinctiveness lies in blending traditional planning principles with contemporary challenges—including digital technologies, climate change, and the demand for flexible living—aiming to create small-scale urban communities that are highly adaptable and sustainable. These communities can then interconnect to form a resilient and sustainable regional urban network.

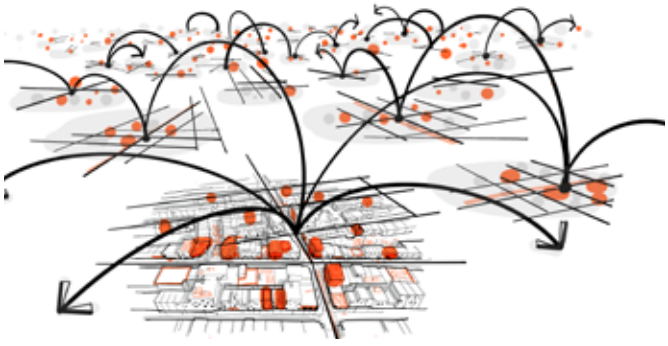

Figure 1. The communities can interconnect to form a resilient and sustainable regional urban network [6]

Some key characteristics of hyperlocal urbanism are as follows:

• Small-scale area: The hyperlocal urbanism model targets specific local communities, even down to a single neighborhood [7].

• Accessibility to essential demands: The hyperlocal commerce model has rapidly developed due to its ability to meet immediate consumer needs within a localized area [8].

• Enhancing community connectivity: The hyperlocal urbanism model strengthens community cohesion and increases resident engagement [9].

• Prioritizing soft mobility: The hyperlocal urbanism model helps decrease private vehicle dependency while improving pedestrian accessibility [10].

• Reducing environmental impact: Reducing the need for private vehicle travel can significantly decrease carbon emissions from transportation [11].

• Flexibility and rapid adaptability: Due to its small scale, the hyperlocal service system is easy to adjust according to demand. Hyperlocal businesses have the ability to respond quickly to changes in consumer behavior [12].

Identifying the key characteristics of the hyperlocal model serves as an important foundation for case study selection and for establishing a framework for case study analysis.

IV. ANALYZING CHARACTERISTICS OF HYPERLOCAL URBANISM MODELS APPLIED TO CITIES IN THE WORLD

4.1. Vauban, Freiburg, Germany

An ecological urban area was developed on an approximately 94-acre site. It currently accommodates around 5,100 residents. The planning strategy prioritizes solutions such as adjacent areas for service and living activities; a transportation network prioritizing pedestrian, bicycle, and public transportation; environmental and on-site resource sustainability; and diversifying community activities to achieve sustainable community targets [13].

The transportation system was designed to prioritize soft mobility. The street network was organized in the form of a "fused grid." The bicycle street network was designed with wide sidewalks, applied consistently throughout the entire Vauban, and directly linked to the last part of Freiburg city. Each house was located within a walkable radius to the tram and utility services, encouraging electric vehicle, bicycle, and walkable mobility; thereby, a more accessible environment was created and travel time was minimized. Bus lanes and railways were designed to ensure continuous connection, allowing residents to access all areas of the city, adjacent areas, and further without the need for a car; as a result, almost all of the streets are designed without parking spaces. Cars can only access the outskirts or central parking area. Private cars are limited in their accessibility to the internal area [14].

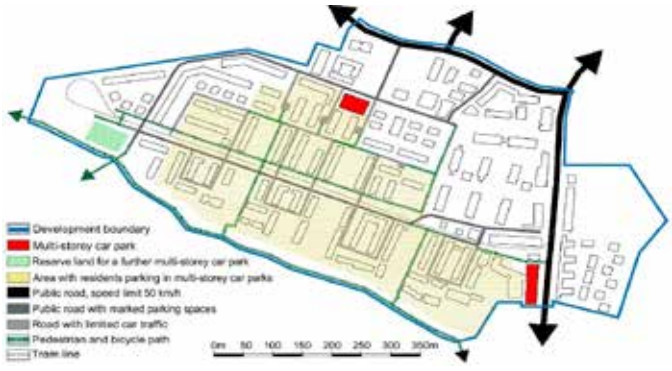

Figure 2. Vauban transportation organizational chart [14]

Functions such as residence, small-scale services, office, healthcare, educational facilities, and community space are located in a coordinated and integrated manner within a walkable radius. Some areas also have working places and services within the compound; thereby, residents' travel time is minimized because of walking, riding a bicycle, and reducing demand for long-distance trips [13]. Therefore, carbon emissions are minimized.

In terms of efficiency and energy self-sufficiency, all buildings meet the Passivhaus standard of 15 kWh per square meter per year or less. The measured thermal performance exceeded the established targets. The high thermal mass construction used has the capability to absorb and store solar energy in the summer and provide cool volume. In addition, a small natural gas-powered CHP system (12 kWh peak) unit, supplemented by rooftop photovoltaics (3.2 kW peak capacity), provides 80% of the electricity needs. A 50 square meter rooftop solar water heater system, integrated with hot water from the CHP system, provides all of the space and water heating demands for the building [13]. The dependence on the national power grid is minimized.

In terms of water resources, vacuum toilet systems, which can reduce the water usage by nine tenths, are installed in order to transport human household waste to an anaerobic biogas digester; as a result, this process produces biogas for cooking and recovers phosphorus-rich fertilizer. Rainwater collection, greywater treatment, and resource reuse systems are consistently integrated throughout the residence area. Graywater from showers and sinks is reutilized after being cleaned in aerated sand filters and treated with ultraviolet (UV) light. A channel system is installed to convey rainwater through gutters into gravel-lined bio-swales, where it is filtered before infiltrating back into the groundwater [13].

Large-scale green area networks and community gardens were designed to function not only as a landscape feature and microclimate regulator but also as a connecting element. It visually connects with the surrounding landscape and the community by serving as a space for diverse community activities from agricultural products to cultural events [13]. It shows a positive outcome by promoting community cohesion and fostering a dynamic community.

The result shows that Vauban was a sustainable residential area, its residents' reliance on cars was reduced, and the local quality of life was improved. It can be used as a model for hyperlocal urbanism in other major cities.

4.2. BedZED, Sutton, South London, England

Within a planning scope of approximately 1.7 hectares, a sustainable residential zone is developed to accommodate around 99 households and 220 residents [15]. This is implemented through a series of planning strategies, including the spatial organization of living, working, production, and daily activities within walkable distances. A closed-loop water circulation system is also applied to ensure resource efficiency and environmental sustainability. In addition, the community structure is intentionally designed to enhance social cohesion and connectivity [16].

The space of living, working, production, and service functions is arranged in proximity and integrated within the residential

areas. Public spaces and community amenities are embedded to facilitate interaction and support daily life. Functional zones such as workplaces, commercial areas, services, and public utilities are organized to ensure that all essential needs can be met within a walkable scale. From the perspective of accessibility and convenience, facilities and travel time between routine activities are developed to achieve the highest level of efficiency [16]. Accordingly, the demand for local employment is encouraged and promoted. Through this approach, a localized micro-economic model is established and operated within the community, contributing to the reduction of long-distance travel demand and minimizing dependence on private vehicles. This directly supports the broader objectives of sustainable development.

The methods of attaining energy self-reliance are put into practice using a strategic planning approach based on the use of renewable sources of energy. The system incorporates efficient ventilation design along with the installation of rooftop-based solar photovoltaics in all public buildings, allowing energy production to take place within the building itself. This strategy decreases reliance on the country's energy grid, decreases the use of fossil fuels, and requires minimal fuel transportation [17]. This helps increase autonomy and reduce carbon emissions within the community space.

Figure 3. Rooftop ventilation system [17]

In a closed-loop water cycle system, on-site harvesting of rainwater and biological treatment of wastewater are used to treat greywater as well as blackwater [17]. This not only helps reduce pressure on urban drainage systems but also ensures efficient water management and, hence, sustainability and climate-change resilience within the project's boundary.

A mobility strategy focused on reducing reliance on private vehicles is pursued through the allocation of limited parking spaces for individual households that are separated from the residential units. At the same time, efforts to design the pedestrian routes as safe and easy-to-access are intensified in order to encourage more walking [16].

The community form emerges as a strategic process of developing a range of different public spaces, such as plazas, inner green spaces, inter-building connections, recreational spaces, and other public activity spaces. Socializing and participation of people within such spaces help create social cohesion and increase neighborhood connectivity. As a result, this approach helps create the distinctive cultures and identities of urban areas [16].

BedZED emerges as a major example proving that it is feasible to build a hyperlocal urban model. It helps achieve the goals of energy/resource sufficiency, sustainability, and other aspects in a hyperlocal approach. Therefore, BedZED shows that the concept of hyperlocality does not exist in urban solutions only but also helps create urban organization.

4.3. Ecoquartier Les Vergers, Meyrin, Switzerland

Developed to become an ecological urban area with 1,350 new apartment units, along with public facilities in more than 30 blocks of buildings, an area of around 16 hectares, it meets the living needs of around 3,000 new residents with a population density of 18,750 people per square kilometer and provides 10,000 square meters of commercial floor space [18].

The planning and development strategy of this urban area is based on the three pillars of sustainable development, such as social solidarity, environmental responsibility, and economic efficiency. Placing emphasis on community spaces, commerce, education, renewable energy, and soft transport and arranging housing, services, and public transit close together helps residents access most basic needs without having to travel far [18]. These main characteristics have contributed to the creation of a close-knit and self-operating urban model at the local scale.

Community spaces were arranged and designed to play a particularly important role in achieving harmony and architectural diversity on the green foundation of urban biodiversity. By supporting community life, social interaction, and outdoor activities, these spaces can become places for interaction, meeting, and exchange, creating cohesion among residents and unity for the residential area [18]. It contributes to the creation of urban culture and identity.

Figure 4. Les Vergers' site plan features a dense and continuous green network [18]

The operation of the energy supply system is based on the efficient use of nearby resources. In order to meet all the heating and hot water needs of the buildings in the area, a renewable thermal energy network is applied, and, in parallel, energy is produced and distributed locally. All buildings are designed to meet high-to-very-high energy efficiency standards in insulation and have installed their own self-generating energy systems (solar power) integrated on the roof to reduce external energy demand. Water from the aquifer of the Rhône River is exploited through nearby wells, first directed to the industrial area to cool equipment,

then channeled to the central heating plant in Les Vergers, where it passes through heat pumps to supply and distribute heating energy to the residence area. Finally, the water flows back into the aquifer of the Rhône River through the Lac des Vernes lake [18].

The manifestation of the regional economy is in the accompanying services within the residential area. The basic living needs of residents, such as retail stores, services, entertainment... are met by 10,000 square meters of commercial area on the ground floor of the buildings. These commercial activities in this area are governed by criteria that respond to the quality of life and local needs. It is reflected not only in terms of purely commercial benefits but also in terms of considering convenience [18]. Therefore, residents can conveniently access services right around the front door of their house for shopping, entertainment... It helps to reduce dependence on the service area of the more distant central area.

The design of traffic and accessibility places particularly emphasizes "soft traffic," prioritizing walking, cycling, and public vehicles. It provides a dense and interconnected network of walkways serving pedestrians and cyclists. Bicycle parking racks are placed throughout to support non-car mobility. Tram and bus stops are installed close together at the outskirts of the urban area. Only two routes that allow motorized vehicles are classified as "mixed traffic areas" with a speed limit of 20 km/h. These two routes lead to three underground parking lots (1,245 spaces). On these two routes, pedestrians are given priority to free movement. The underground parking lots, which are located separately from the residential areas, are only accessible through public spaces, thereby promoting encounters, social interaction, and bringing vitality to the urban area [18]. It shows that encouraging and promoting residents to choose walking, cycling, or using public transport is the core value of the transportation system.

The achievement of very high operational efficiency demonstrates that Les Vergers is also a representative example of a developing hyperlocal urbanism model, particularly in areas such as soft transportation systems, renewable energy, planning of nearby service systems, and a cohesive community.

5. RESULTS AND DISCUSSION

The hyperlocal urbanism model has achieved a certain level of success. In order to continue developing and expanding, the solutions and strategies for implementing them need to be identified. This is aimed at guiding urban development in a way that is appropriate to the context and times, while simultaneously improving the quality of life.

Table 1: Implementing strategies of the main characteristics of the hyperlocal urbanism model through 3 urban projects.

Characteristics of the hyperlocal urbanism model	Solutions/implementing strategies		
	Vauban	**BedZED**	**Les Vergers**
1. Scale area	94 acres [13].	1.7 hectares [15].	16 hectares [18].
2. Accessibility to daily essential needs	- Organizing within cycling and walking radius [13].	- Organizing within walking radius [16].	- Organizing accessibility within walking radius [18].
3. Resource management solutions – Energy	- Applying Passivhaus standard [13]. - CHP system [13]. - Rooftop photovoltaic system [13].	- Renewable energy utilization plan [17].	- Applying high energy efficiency standards [18]. - Internal energy system [18].
3. Resource management solutions – Water	- Vacuum toilet systems [13]. - Circular water system [13].	- A closed-loop water circulation system [17].	- Circular water system [18].
4. Transportation system	- Prioritizing "soft vehicles" - "fused grid" street network layout [14].	- Minimizing private vehicle use [16]. - Encouraging walking, cycling, and public transport [16].	- Focusing on "soft mobility" - Prioritizing pedestrians, cyclists, and public transport [18].
5. Economy/production and consumption.	---	---	- Internal farm products supply chain [18].
6. Solution to connect community	- Large-scale green area networks and community spaces [13].	- Diversification of green-open spaces [16].	- Diversification of landscapes. - biodiversity [18].

In the context of Vietnam, urban areas characterized by closely adjacent small neighborhoods, dense alley networks, and vibrant small-scale economic activities show strong potential for the application of the hyperlocal urbanism model. However, achieving high effectiveness depends largely on institutional conditions, land management frameworks, and urban governance. First, hyperlocal urbanism requires flexibility in land use, encouraging multifunctional development. This necessitates the adjustment and updating of regulations, standards, and permitting mechanisms. Second, at present, the government has advantages in organizing and regulating urban space through land allocation and leasing policies. However, this may slow the emergence of community-driven initiatives, such as cultural spaces and locally distinctive production and business activities. Therefore, decentralization

mechanisms and experimental approaches are needed. Third, the hyperlocal urbanism model requires active involvement of local communities and grassroots authorities in the management of public spaces, local economies, and services. In this regard, the government's current emphasis on community-oriented governance is highly appropriate; however, more clearly defined and specific policies are still necessary. In summary, in order to achieve successful implementation, greater flexibility in policies and planning frameworks, increased autonomy at the local level, and the establishment of co-governance mechanisms among government, communities, and businesses are required.

6. CONCLUSION

Developing a hyperlocal urbanism model is not about creating standalone entities or forming completely closed and self-sufficient areas, but rather about establishing a self-sustaining and connected model to increase flexibility, adaptability, and responsiveness, which are not limited to a single hyperlocal neighborhood unit but encompass a network structure comprising multiple nodes that are also hyperlocal neighborhood units. Therefore, clearly defining the role of each "node" within this multi-node network structure, while establishing a general goal, carries significant meaning for promoting economic, social, and environmental sustainability.

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