

The role of form-based codes (FBCs) in creating quality built environment

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Abstract. This paper explores the relationship between form-based codes and the quality of built environment, reviewing the existing literature on both topics. The study uses the comparative analytical approach to explore the extent to which the goals of form-based codes align with those of the quality of built environment. Finally, the study reaches several conclusions, the most important of which is that using the standards of form-based codes, including the principles of New Urbanism and smart growth, means achieving the quality built environment goals.

Key words: form-based codes, quality of built environment, development regulations, urban policies, sustainable cities.

1. Introduction

The built environment is a crucial aspect of cities, impacting the way people live, work, and interact with each other¹. In recent years, there has been growing interest in using form-based codes as means of regulating the physical characteristics of built environment². Form-based codes focus on the physical form and layout of buildings, streets, and public spaces, rather than on land use, as conventional zoning codes do. This approach aims to create more walkable, livable, and sustainable communities³. However, one key question remains: do form-based codes actually lead to a quality of built environment? To answer this question, this paper reviews existing literature on form-based codes and quality of built environment, then investigates the degree to which the goals of form-based codes align with those of enhancing the quality of built environment, relying on the assumption that a better understanding of the relationship between form-based codes and quality of built environment can inform future policies and practices aimed at creating more sustainable and livable cities^{4, 5}.

2. The concept of form-based codes (FBCs)

FBCs are defined as a planning and zoning tool for regulating development using physical form rather than land use as organizing principle for the code⁶. It aims to contribute to an improved quality of life by promoting predictable built outcomes and a high-quality public

¹ Gehl 2010

² Chicago Metropolitan Agency for Planning 2013

³ McGrath 2008

⁴ Kunstler 1998

⁵ Porter 2010

⁶ Mehta and Dhindaw 2020

realm. Form-based codes address the relationship between form and mass of buildings in conjunction, and to the public realm, and scale and types of streets and blocks⁶. FBCs are holistic, addressing both private and public space design to create a whole place, including buildings, streets, sidewalks, parks, and parking. They regulate private development for its impact on the public realm⁶. Also, they address relationships between pedestrians and vehicles, and regulate all elements that constitute the physical design of place^{7 8}. Form-based codes are related to the New Urbanism, a movement developed as an alternative and possible solution to the negative consequences of zoning regulations with the ultimate goal to create a better urban form. The American Planning Association defines New Urbanism as "the process of integrating the components of modern life housing, workplace, shopping, and recreation into compact, pedestrian friendly, mixed use neighborhoods, linked by transit and set in a larger regional open space framework"⁷.

Form-based codes include the principles of New Urbanism, which make them efficient in adopting modern development trends. They are commonly composed of at least five basic elements: a regulating plan, public space standards, building form standards, administration, and definitions⁸. Some form-based codes also include architectural standards, landscaping standards, signage standards, environmental resource standards, and annotations⁹. Table 1 illustrates the characteristics of form-based codes.

Table 1. Characteristics of form-based codes¹⁰.

Basic priorities	Primary focus on form, and less on land use
Regulation and basic elements	Emphasize site design, building form and character, streetscape design, and promote a neighborhood vision (compatibility) and mix of uses
Basic characteristic	Purposeful, pro-active, and focused on implementing community planning goals and objectives; predictable, because they focus more on form and less on land use
Field of application	Created for a specific planning area, tailoring the requirements to fit specific places or neighborhoods by reflecting local architecture and overall character
Compatibility with modern development trends	Clear role in supporting and enabling modern development trends; help New Urbanism movement to implement its goals in creating modern development patterns leading to more environmental and sustainable forms of development; encourage compact mixed-use spaces, pedestrian friendly streets, diversity of housing and transportation options, attractive public spaces and preserving green areas
Awareness of place making	Focus on how development relates to the context of surrounding community, addressing the design of public realm and importance that streetscape design and individual building character have in defining public spaces and a special "sense of place"; take into consideration the importance of preserving the local character of areas to be developed and the desire of communities for a certain form of development, which makes them efficient in creating places that people love
Development pattern	Contains compact mixed-use spaces, pedestrian friendly streets, diversity of housing and transportation options, attractive public spaces, and more preserved green areas; in more detail, tree-lined streets, waterfront promenades and greenways, require plazas and on-site public open spaces, and parking is screened in garages or behind buildings and is subject to a lower demand overall.
Community participation	Community and its vision involved at all stages of creation, and expressed in the form of specific maps and drawings.
Presentation type	Depend on graphics to define key concepts and requirements.

⁷ Gowdy 2009

⁸ Chicago Metropolitan Agency for Planning 2013

⁹ Mullins 2010

¹⁰ Nizam and Petrișor 2022

3. The concept of 'quality of built environment'

William A. Foster sees that quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skillful execution, and represents the wise choice of many alternatives¹¹.

In the opinion of Belt Collins, quality implies a sincere commitment to attaining the highest practical standard. With regard to a quality built environment, first he defines the built environment, as a term referring to the constructed surroundings, which provide the setting for human activities. It is the world that people inhabit every day. It includes the houses, offices and work spaces, outdoor spaces where people relax and play, and perceptions of built environment, i.e., how it looks, how well it is maintained, whether it feels safe, influence people ability to develop a deep attachment to a particular place and ultimately the desire to preserve and protect it. Secondly, he mentions several attributes applied in order to achieve a quality built environment, i.e., the built environment should be responsive to its particular place and setting, environmentally and culturally sustainable, functional and attractive to both staff and visitors, universally accessible, economically responsible, taking into account long-term costs associated with maintenance, and beneficial to public health and well-being¹².

Lars Amréus *et al.*¹³ believe that quality is critical. Quality is about the greater public good to be expected, from buildings to promote human health, safety, and wellbeing as well as addressing today's many social, cultural, environmental and economic concerns. They propose eight quality criteria in what it is called Davos Baukultur Quality System.

This system aims to maintain, develop and create places fitted for purpose, sustainable, safe, comfortable and healthy for residential use, work, leisure or infrastructure. The criteria are: on the governance level, importance of having good governance; on the functional level, place should fit its purpose; on the environment level, importance of protecting the environment; on the economic level, the importance of adding economic value; on the social level, importance of achieving diversity through connecting people; and aesthetically, achieving spatial coherence, and beauty of places, in addition to improving the sense of place¹⁴.

The Architect's Council of Europe in its statement at the ACE conference "How to achieve quality in the built environment"¹⁵ defined the quality of a place as outcome of multiple interrelated factors. They explained that designing quality places requires bespoke solutions, based on a careful assessment of the context and needs of the end-users, in order to optimize the economic, social, environmental and cultural values of the place. They declared that a high-quality built environment impacts positively on people's everyday lives,

¹¹ Collins 2010

¹² *ibid*

¹³ Amréus *et al* 2018

¹⁴ *ibid*

¹⁵ The Architect's Council of Europe 2019

and standardized and "one-size-fits-all" solutions, single-minded approaches, and excessive focus on economic or technical aspects cannot result in qualitative outcomes¹⁶.

In addition, they identified some essential characteristics of a place as drivers of quality, as they undoubtedly bring benefits of an economic, social, environmental and cultural nature to individuals and society. Although each person may assign different value to these characteristics, they should all be taken into account when evaluating the quality of places¹⁷.

According to the Architect's Council of Europe¹⁸, important characteristics of a high-quality place include:

- Aesthetics: buildings and cities must be attractive and interesting; architectural quality has an artistic component;
- Habitability: the place fulfills its intended functions and serves its intended purpose. Because of its technical features, it is safe, healthy, and comfortable. It is kept up properly and gives a sense of security. At the district level, it integrates seamlessly all essential features and services that people frequently need such as residences, workplaces, retail establishments, public services etc;
- Environment friendliness: the place is made low carbon, energy efficient, and climate change resistant throughout its lifetime;
- Accessibility and mobility: the place is well connected by public transportation, making it simple to get from one location to another, especially when using soft modes of transportation like walking and cycling, which includes people with limited mobility; users can easily perceive the place because of the straightforward volume and space distribution;
- Inclusiveness: everyone, regardless of age, gender, or ethnicity, must feel welcome and have the chance to engage in the space, which is meant for all;
- Distinctiveness and sense of place: the place is unique, fits the surrounding environment, and has distinguishing features that give a sense of place;
- Affordability: the program and the client's place and financial situation are compatible;
- Integration into the surrounding environment: the place is harmoniously and coherently incorporated into its built, natural, and cultural environment.

4. FBCs and quality of built environment

From the previous section, it could be concluded that:

- Quality results from high intention, intelligent direction, and execution skillfulness. It needs commitment for attaining the highest practical standard. In addition, standardized and "one-size-fits-all" solutions, single-minded approaches, and excessive focus on economic or technical aspects cannot result in qualitative outcomes;
- To design quality places requires bespoke solutions, based on a careful assessment of the context, and the needs of users. The design process has to address today's economic, social, environmental and cultural concerns;
- Quality is about greater public good to be expected from buildings to promote human health, safety, and wellbeing. Quality is the positive impact on people's everyday life;

¹⁶ The Architect's Council of Europe 2019

¹⁷ CNU Journal 2017

¹⁸ The Architect's Council of Europe 2019

Also, it was concluded that the standards to be taken into consideration, when achieving quality places, are environmental, functional, economical, governance, diversity and inclusiveness, context and integration into surrounding, distinctiveness and sense of place, and aesthetics, i.e., beauty and attractiveness.

In order to clarify the relation between form-based codes (FBCs) and quality of built environment, a brief description of FBCs is provided. Subsequently, the study connects FBCs with the findings from the revision of the quality of the built environment.

Form-based codes are smart organizational solutions, considered an alternative to conventional regulations, and studies have proven that these conventional regulations have negative effects on environmental, social, urban, cultural, and economic levels. This is due to their reliance on “one-size-fits-all” solutions, and single-minded approaches, in addition to their focus on the economic and technical sides more than other aspects. Therefore, the use of conventional regulations cannot lead to quality results. On the contrary, using FBCs as alternatives to conventional regulations will lay foundation for establishing quality places.

Form-based codes (FBCs) include efficient, practical, and detailed standards in order to ensure skillful execution of plans, and thus have the advantages of quality, being a commitment to achieving high practical standards and ensuring skillful implementation.

FBCs are tools including the principles of New Urbanism. Some of them include the principles of smart growth. Therefore, the essential role of FBCs is to enable the establishment of New Urbanism and smart growth communities. Knowing that, New Urbanism is a movement that seeks to design good physical environments in order to create, happy life, healthy places, and thriving businesses¹⁹, while smart growth covers a wide range of development and conservation strategies that help protecting health, natural environment and creating more attractive, economically stronger, and socially diverse societies²⁰.

The purpose of the emergence of the New Urbanism movement and smart growth was a response to current problems of the era, addressing issues on the environmental, social, economic, urban, and cultural levels. These movements contain a variety of comprehensive principles, all of which contribute to the achievement of upgrading and improvements at the aforementioned levels. Since achieving quality in the built environment depends on achieving standards that touch the environmental, social, economic, urban, and cultural levels, it can be said that using the standards of form-based codes, which include the principles of New Urbanism and smart growth, means achieving the quality built environment goals.

5. Conclusion

A better understanding of the relationship between form-based codes and quality of built environment can have a significant impact on urban policies and practices. Form-based

¹⁹ CNU Journal 2017

²⁰ Smart Growth Online 2015

codes provide a practical and detailed approach to achieving high-quality standards in urban development, which can lead to creating more sustainable and livable cities. By enabling the use of form-based codes in urban policies, policymakers can establish a commitment to achieving high practical standards and ensuring skillful implementation in urban planning. This approach can help create places that are more attractive, economically stronger, socially diverse, and environmentally sustainable. Therefore, it is crucial to consider the use of form-based codes in future urban policies and practices to achieve the goal of creating places with high quality.

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