A Holistic Framework for Evaluating QOUL Linking Contemporary Planning Theories Principles

Riham Salah [1], Mohga Embaby [2] and Ehab Okba [2]

[1] Architecture Department, Faculty of Engineering, Canadian International College (CIC), Elsheikh Zayed, Giza, Egypt
[2] Architecture Department, Fayoum University, Faculty of Engineering, Fayoum, Egypt

ABSTRACT

The new urban theories (e.g. sustainable development and smart growth) prioritise inclusive, safe, resilient, and sustainable urban planning protocols to improve the quality of urban life (QOUL). In response, researchers have developed various indicators to assess and monitor QOUL. However, these indicators are not currently linked to contemporary planning theory (CUPT) indicators, representing a limitation in their applicability. Therefore, this study proposes a detailed examination of CUPT principles and their contribution to QOUL to address this limitation. Initially, a comprehensive review of the existing QOUL indicators and CUPT principles is conducted to provide a foundation for identifying conventional QOUL. Then, a comparative analysis is performed to identify gaps and overlaps between the current QOUL indicators and the principles of CUPT. By translating these principles into measurable subjective and objective indicators, we aim to advance the measurement of QOUL. Following this, the extracted indicators from CUPT are added to the final proposal. The proposed framework encompasses six objective sub-dimensions with 17 indicators and four subjective sub-dimensions with 13 indicators. This offers a holistic framework for evaluating QOUL.

1. Introduction

Urban areas around the world have experienced significant changes due to population growth, economic restructuring, and uncontrolled expansion. These changes have resulted in various challenges related to transportation, air pollution, urban planning, and resource allocation. To address these challenges and improve the living conditions of people in densely populated cities, the concept of the quality of urban life (QOUL) has emerged (Bovkir *et al.,* 2023). The concept of QOUL encompasses several aspects (Abbate *et al.,* 2001):

- It examines the relationship between individual and collective life situations and the interplay between material and non-material dimensions of well-being.
- It integrates subjective perceptions of living conditions with objective living conditions.
- It evaluates subjective and objective characteristics of preferences and behaviours based on inherent traits, focusing on QOUL as an individual perspective of socio-territorial circumstances.
- It emphasizes identifying well-being, analysing social phenomena, and providing feedback for urban policies.

The QOUL framework examines the relationship between individual and collective well-being, considering both material and non-material aspects. Therefore, it combines subjective perceptions of living conditions with objective measures and evaluates preferences and behaviours based on inherent traits. The framework also focuses on identifying well-being, analysing social phenomena, and providing feedback for urban policies (Duan *et al.,* 2023). Indicators of QOUL directly impact the liveability of cities, including the quality of public spaces, land use patterns, recreational opportunities, infrastructure development, population densities, accessibility to public services, and social attributes such as health, safety, education, equality, and social inclusion. These indicators help decision-makers and urban planners assess the effectiveness of their initiatives and measure people's behaviour, life satisfaction, and happiness (Marans and Stimson, 2011).

QOUL has significant implications for research and urban policy.

There are many studies on the development of QOUL dimensions in the literature. These studies develop composite dimensions of the demographic, social, environmental, and economic profiles of individuals or groups to provide a general aspect to measures of well-being and life satisfaction in the ordinary sense (Bovkir *et al.,* 2023). Although most of the dimensions are shared among researchers, there are some differences due to the contexts. For example, the QOUL measurements and methodology project of the European spatial planning observation network (ESPON) aims to direct QOUL implementation via six dimensions. In comparison, the current QOUL has seven dimensions. These dimensions, represented by environmental, physical, mobility, social, economic, psychological, and political aspects, are necessary to measure and assess the current QOUL in a city using sets of indicators (Popescu, 2020). CUPT encompasses a range of perspectives, including new urbanism, transit-oriented development, and sustainable development. These theories emphasise compact, mixed-use neighbourhoods, efficient transportation, and environmental stewardship to create liveable and sustainable cities. The previous studies that have linked QOUL to CPUT standards for measuring QOUL indicators are listed in Table 1. These indicators are considered conventional for QOUL, as they do not incorporate urban elements that keep up with sustainable technological advancements. Therefore, it is critical to add additional indicators and analyse the factors that influence QOUL, such as smart sustainable and urban development (Discoli *et al.,* 2014).

Table 1: Linking QOUL to CPUT standards for measuring QOUL indicators - Previous studies.

Studies	QOUL Focus	Theories Focus
(Garau and Pavan, 2018)	Urban sustainability and smart indicators	Sustainable-smart urbanism
(Elkawy and Ahmed, 2023)	Urban sustainability and green indicators	Sustainable development and green urbanism
(Gomaa and Fouad, 2022)	Subjective and objective indicators	New urbanism, smart growth, urban village, and smart urbanism
(Mohamed *et al.,* 2017)	QOUL seven dimensions	Urban capacity and capability
(Marans and Stimson, 2011)	Objective, subjective, and behavioural indicators	Environments and behavioural theories
(Taqi *et al.,* 2021)	QOUL seven dimensions	New urbanism and smart growth
(Alvarez and Müller-Eie, 2017)	QOUL indicators	Sustainable urban development
(Okba *et al.,* 2016)	Sustainable indicators	Sustainable development

| (McCrea, 2007)	Objective and subjective indicators	New urbanism, smart growth, and smart urbanism

The research problem lies in the gap between CPUT and the assessment of QOUL through indicators. CPUT focuses on sustainability, equity, livability, and social inclusivity, but there often needs to be more direct integration between these theories and the measurement of QOUL indicators. QOUL indicators provide a comprehensive understanding of urban life's dimensions, but they must align with the principles and goals of CPUT. To fill the existing gap, this study aims to develop a comprehensive set of QOUL indicators by comparing existing indicators with the principles of CUPT. The goal is to identify new urban subjective and objective indicators that support a multidimensional evaluation of factors influencing residents' well-being and life satisfaction. These proposed indicators will offer decision-makers a holistic framework to assess the current QOUL in cities and evaluate the effectiveness of urban policies and initiatives in developing and improving urban environments. The research method of this study is demonstrated in Fig. 1.

Figure 1: The research method approach of this study.
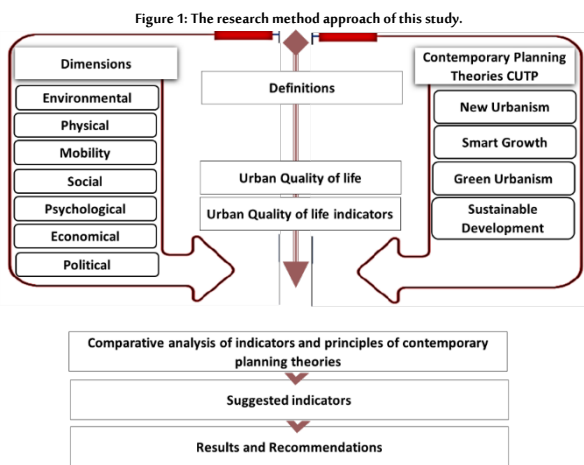
2. Review and Conventional Analysis of QOUL

Dimension, subdimension, and indicators are essential components in understanding and assessing the QOUL, as shown in Fig. 2. Dimensions represent broad categories or areas of focus within QOUL, such as environmental, physical, mobility, social, economic, psychological, and political aspects. Subdimensions further break down these broad categories into more specific themes or subcategories. For example, under the social dimension, subdimensions could include public health, safety, education, equality promotion, and social inclusion. Indicators are specific measures or metrics used to evaluate and quantify the different aspects of QOUL within each dimension and subdimension. They provide objective data and information for decision-makers and urban planners to assess and improve urban environments (McCrea, 2007).

Figure 2: The hierarchical structure components of QOUL
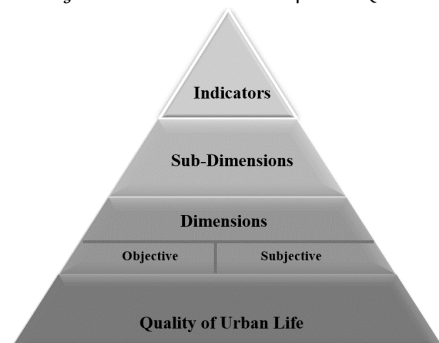
QOUL encompasses objective and subjective dimensions that contribute to the overall well-being and satisfaction of individuals living in urban areas (Ardestani *et al.*, 2022).

2.1. Objective Dimensions

QOUL is evaluated using quantifiable indicators that measure the availability of residential services. This evaluation relies on spatial data obtained from official sources. It effectively describes the three dimensions of QOUL: environmental, physical, and mobility (von-Wirth *et al.*, 2015), as depicted in Tables 2 and 3.

- Environmental: This dimension emphasizes the importance of providing a clean and pollution-free environment for the population. It mentions incorporating elements like trees and promoting the use of multiple modes of transportation such as walking and bicycles. Additionally, it highlights the potential use of technology and artificial intelligence to promote renewable energy.
- Physical: This dimension focuses on This dimension focuses on humanising residential neighbourhoods and creating urban environments that are friendly and conducive to human well-being. It also mentions the provision of services and facilities that cater to the needs of the population.
- Mobility: This dimension aims to provide various modes of transportation, including walking, cycling, and public transport, which are integrated into the design elements of residential streets.

2.2. Subjective Dimensions

QOUL assessment involves indicators that gauge population satisfaction with city services. This dimension focuses on social, economic, psychological, and political aspects and aims to assess the efficiency and effectiveness of these services (McCrea, 2007), as illustrated in Table 4 .

- Social: Social: This dimension emphasises the availability of services and facilities for all individuals. It is crucial to ensure that the constituent elements of a healthy urban environment are present in city neighbourhoods. Additionally, providing diverse housing options that cater to various economic classes within society is of great importance.
- Economic: This dimension focuses on supporting and stimulating local commercial activities owned by neighbourhood residents, such as restaurants and cafes. It also involves ensuring facilitators are available to support residents' economic capacity.
- Psychological: This dimension focuses on preserving the identity and historical value of residential neighbourhoods, as this greatly influences the residents' sense of uniqueness and belonging.
- Political: This dimension involves establishing urban policies and regulations to manage urbanisation and prevent abuse, aiming to preserve the urban setting and improve the overall QOUL. It also emphasises the importance of involving the local community in decision-making and brainstorming.

2.3. QOUL Indicators

QOUL indicators are measurable metrics that assess living conditions and well-being in urban areas. They measure the key dimensions and subdimensions that contribute to residents' well-being. Classifying the indicators of QOUL into a subjective category and an objective category offers several advantages. First, this classification provides a clear distinction between measurable, quantifiable factors and those that rely on individual perceptions and experiences. Objective indicators, such as income levels and healthcare access, offer a standardised and comparable basis for analysis. On the other hand, subjective indicators, such as happiness or life satisfaction, capture the unique perspectives and diversity of individuals. Tables 2, 3, and 4 show the conventional structures of the objective and subjective dimensions, subdimensions, and indicators according to the literature. Second, this classification enables policymakers to prioritise interventions based on specific dimensions. Objective indicators help identify areas that require immediate attention, while subjective indicators highlight the subjective well-being of

individuals. By understanding both the objective and subjective aspects, comprehensive strategies can be implemented to enhance overall QOUL (Liu *et al.*, 2023).

Also, basic needs and general goals are fundamental elements of QOUL indicators that encompass essential requirements for human well-being and survival, as shown in tables 2, 3, and 4. Tand indicators focus on ensuring individuals have access to fundamental necessities to live a dignified life. Basic needs typically include food security, access to clean water and sanitation, adequate shelter, healthcare services, and education. These indicators form the foundation for assessing the overall QOUL in a community or society.

Table 2: QOUL Objective Indicators (Environmental).

	Dimensions	Subdimensions	Standard indicator	Basic needs	General goals
Environment	Air Quality (Chiarini *et al.*, 2021)	Atmospheric quality	Average annual levels of PM10 Average annual levels of environmental lead (Pb) Average annual levels of CO₂	Control of emissions and pollutants	Ensure comfortable and healthy environment.
		Air quality heat	Air quality health index. Residents perceive air pollution as a problem.	Preservation of public health.	
		Air toxicity	Efforts to purify the atmosphere	The general purifying of the atmosphere.	
	Water Quality (Liu *et al.*, 2019)	Drinking water quality	Public health water quality rating. Zones of distribution Increased % of daily potable water access for the population	Continual, high-quality water supply.	Ensure environmental quality for drinking water, subsurface sources, and waterways.
		Water consumption	Per capita domestic water use Industrial and commercial	Reduce water usage.	
		The quality of lake water	The public health rate of beach and stream/lake water quality. Water bodies pose a risk.	Safe water for human recreational use and activities	
	Earth Quality (Van-Kamp *et al.*, 2003)	Remediation of contaminated land	Land remediation	Encourage land reuse by preventing waste generation.	Reduce land consumption, promote biodiversity, and accommodate human activities.
		Biodiversity	Living resources conservation plan.	Habitat preservation.	
		Environmental fingerprints	Ecological footprints in Egypt. Regional ecological footprints	Land must support human activities.	
	Material Quality (Cömertler, 2017)	Material selection in consideration of health impact	Material selection in consideration of health impact	Encourage sustainable construction materials and products	Minimise exposure to hazardous materials
	Local Environmental Quality (Marans, 2015)	Enjoy the scenery	Green area percentage	Enjoy natural landscapes and parks; ensure biodiversity preservation	Offer comfortable urban living conditions.
		Natural land gardens	Access to green space is simple		
		Outdoor thermal comfort	The wind environment Consider building quality Layout, landscaping, paving, construction, and cladding materials	Increase outdoor comfort during the transition period and reduce discomfort during the summer	
		Comfort in outdoor lighting	Residents' perception of noise pollution as a problem		
		Reduce the effect of odour	Sunlight, external surfaces, and treatment for glare	Improve visual comfort	

	Dimensions	Subdimensions	Standard indicator	Basic needs	General goals
	Power Quality (Marans, 2012).	Energy consumption	Electrical efficiency level.	Use alternative ways of resource supply.	Rational use of resources.
		Energy from renewable sources	Projects of renewable energy. Percentage of renewable supply.		
		Sewage	Wastewater treatment	Promote water reuse and reduce wastewater pollution.	

Table 3: QOUL Objective Indicators (Physical and Mobility).

	Dimensions	Sub dimensions	Standard indicator	Basic needs	General goals
Physical	Land Use (Chapman and Larkham, 1999).	Mixed Land Use	Diversity index Neighbourhood completeness	Expand shared buildings or project areas for multiple purposes.	Provide services to inhabitants and foster a healthy environment.
		Neighbourhood Services and Facilities	Infrastructure availability. services and facilities availability. The cleanliness of the amenities. The attraction of amenities.	Appropriate community services and facilities	
		Effective use of land	Land reuse	Useful use of land	
	Compact Neighbourhood (Murgaš and Klobučník, 2018).	Density	Gross residential density floor-area ratio.	Provide lovable environments while preserving the amenity	Enhance liveability, walkability, and transit effectiveness to improve public health.
	Layout of a City (Murgaš and Klobučník, 2018).	Square Network and Street	Complete streets Providing proper evacuation routes.	Comprehensive street network catering to various uses and requirements.	Urban spaces are well-defined and utilized.
		The Building Block	Providing adequate evacuation routes. Parking is well integrated. Height-to-width ratio of a building	Urban spaces with clear boundaries and enclosures.	
	Housing and Buildings Quality (Koçak Güngör and Terzi, 2022).	Building Quality	Building technology. Fulfilment of building codes	Increase overall efficiency	Fulfil households' needs
		Housing Quality	Durability, adaptation requirements, average condition overpopulation, access to kitchen and bathroom facilities, and access to infrastructure.	Offer suitable shelter for basic needs.	
	Management and Maintenance	Management and Maintenance	Maintenance policies, maintenance responsibilities, a resident's manual, and an on-site office are all available.	Empower community facilities with ownership.	Development sustainability.
Mobility	Accessibility (Lotfi and Koohsari, 2009).	Pedestrian Catchment Area	Primary and secondary facilities' pedestrian catchment areas.	Maximize walking distance before driving or cycling.	Promoting physical exercise and lowering automobile emissions to promote public health.
		Connectivity	Index of the Direct Route. Index of connectivity. Size of the blocks. External connectivity is provided.	Assess development's accessibility.	
	Walkability and Cyclability (Duan *et al.*, 2023).	Network for Walkable	Sidewalk network coverage. Sidewalk quality. Safe pedestrian crossing.	Network for walkable connects dwellings to diverse neighbourhood uses.	Encourage walking while not excluding vehicles.
		Facilities and a Cyclable Network	Bicycle lane Km. Bicycle parking is available.	The cyclonic network connects dwellings to diverse city uses.	
	Public Transportation	Using public transport	Use public transportation.	Minimize car dependency.	Promote public transportation usage.
		Various modes of transportation are available	Various modes of transportation are available.	Transit service options	
		The cost of public transit	Frequency of public transport	Frequency rate.	
		Appropriate public transport	Convenience, affordability, and safety.	Make transportation safe, comfortable, and reasonably priced.	

				Minimize traffic congestion.
Traffic Load (Sultan *et al.*, 2021).	Traffic volume	Traffic, vehicle ownership, work, distances, population, and travel outside cities.	Minimize traffic volume.	
	Transportation demand management.	Effective transportation demand management measures.	Implement traffic policy to reduce dangers.	

Table 4: QOUL subjective indicators (Social, Psychological, Economic and Political).

Dimensions		Subdimensions	Standard Indicator
Social	Social Equity and Inclusion (Marans, 2012).	Social justice	Equal access to low-cost housing. Access to services and facilities is equal. Aims of the local community.
		Inclusive communities	Enhancing familiarity, legibility, accessibility, comfort and personal safety.
	Social Connectedness (Sousa-Gomes *et al.,* 2010).	Social integration	Housing is provided by the government. Index of housing diversity. Tenure with a mix of types.
		Social network	The establishment of an open space network. Cultural facility provision. Provision of social services. Religious facilities are provided. Telecommunications service provision.
		Participation in society	Legislation that encourages the community to participate in organisations. Participate in the planning process. Management participation.
	Behavioural Performance (Gomaa and Fouad, 2022).	Public awareness	Urban quality of life awareness.
		Neighbourhood stability	Tenure and percentage of temporary private dwellings secured.
		Neighbourhood vitality	Active frontage
psychological	Community Identification (W. Liu *et al.,* 2018).	Urban image	Paths, boundaries, focal points and landmarks
		Design that is responsive.	The local jargon.
		Heritage sites and historical relics.	Conserve heritage sites and historical remains.
		Personalisation of space	Personal territory, enhancements, privacy and entry customisation options are available.
	Pleasing Milieu.	Architectural quality	Architectural quality.
		Landscape quality	Landscape quality.
Economic	Economic Development (von Wirth *et al.,* 2015).	Employment	Employment, labour and skills and jobs-housing balance
		Local business	Locally owned firms, priority industries and new ventures.
	Economic Standard Living (Kubiszewski *et al.,* 2018).	Cost of living	The index of housing prices. Service and facility costs. A hybrid approach to housing finance.
Political	Urban Policies and Strategies (Mulligan *et al.,* 2004).	QOUL policies.	Policies enhancing QOUL.
		Life strategies for urban quality.	Codes and principles for effective law enforcement.
		Management and urban governance	Smart governance and smart urban planning. Management and urban governance.
	Civil and Political Rights (Cummins, 2000).	Participation of the community in council decision-making	The public has an impact on council decision-making. A look at how councils make choices. Council decisions are made in the best interests of the city. Women's representation on local councils.

Based on Tables 2, 3 and 4, the most widely used indicators have been identified and classified into objective and subjective components of QOUL to verify the basic needs and overall objectives. Notably, the environmental dimension emerged as the most thoroughly researched because it has the most basic needs of well-being. Its goals include preserving a comfortable and healthy environment, promoting biodiversity, reducing land consumption, minimising hazardous material exposure, providing pleasant urban living conditions and assuring waste management safety.

3. Evaluating QOUL indicators Linking CUPT Principles

3.1. Contemporary Urban Planning Theories (CUPT):

The term 'urban theory derivatives' describes the many branches and uses that have sprung from the original urban theory, which seeks to make sense of and explain urban complexity. However, there are certain limitations to these variants. They may need to portray the changing nature of cities as they adapt to rapid globalization and technology advances, simplifying urban dynamics and ignoring cultural and contextual aspects (Grant, 2019). Currently, the field of urban planning is experiencing the rise of new theories and approaches that provide different options for planning cities. Because conventional

thinking and technocratic planning have flaws and limits, planning theories have grown to fill the gaps. CUPT brings new insights and methodologies that may rely on different theoretical viewpoints. Its goal is to support and improve the QOUL. CUPT uses many theories, such as new urbanism, smart growth, compact cities, sustainable urbanization, smart urbanism, healthy communities, and sustainable development. CUPT aims to make societies that better meet the needs of people who live and work in cities, keep cities from growing too fast, and improve the quality of life in cities, as shown in Fig. 3, (Debrah *et al.*, 2020; Kaushik, 2018).

Figure 3. Classification of planning theories.
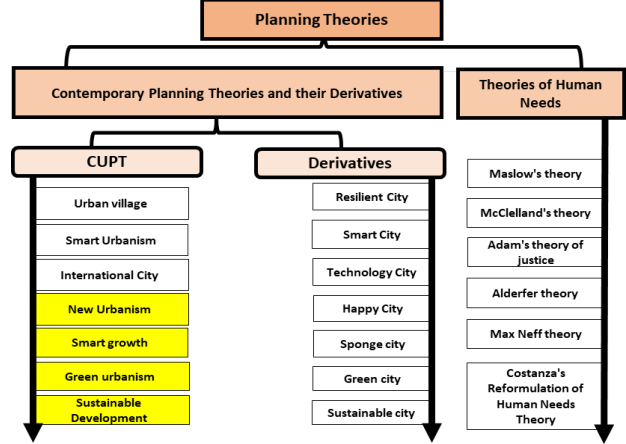
This research focuses on contemporary planning theories rather than derivative ones. Specifically, four recent theories are selected: new urbanism, smart growth, green urbanism, and sustainable development , which are described as follows.

- New Urbanism: New urbanism is an urban design movement that started in the 1980s in the United States. It aims to tackle issues caused by urban sprawl and suburban growth after World War II. The movement has influenced real estate development, urban planning, and land use strategies. The principles of new urbanism are: (i) mixed land use, (ii) pedestrians and crossings, (iii) civil buildings and places for public gatherings, (iv) groups of parks, (v) housing levels, (vi) economic construction, and (vii) a safe and secure environment (Forsyth, 2021)..

- Smart Growth: In the early 1990s, several national organizations recognized the problems facing neighbourhoods. In 1996, these organizations formed the smart growth network, which is now a broad coalition of 32 organizations supporting smart growth. It developed the nine principles for smart growth. These principles envision the characteristics associated with healthy, vibrant, and diverse neighbourhoods that support a QOUL (Ye *et al.*, 2005). The principles of the smart growth theory are summarized as follows: (i) mixed land use from compact building design, (ii) a range of housing opportunities and options, (iii) creation of pedestrian-friendly residential neighbourhoods, and (iv) a strong incubator to connect people with the place and enhance the sense of belonging. (v) preserving open spaces and agricultural lands, (vi) developing existing development, (vii) providing a variety of transportation options, (viii) making economic development decisions out, fair and cost effective and (ix) encouraging the community to cooperate (Porter, 2002).

- Green Urbanism: Green urbanism is a planning approach that aims to create cities and communities that are beneficial to both humans and the environment. It promotes sustainable lifestyles and reduces global resource consumption. This theory originated in 2007 and has been embraced by countries like Dubai, Singapore, and the United States. The new administrative capital in Egypt stands out as a prominent example of a city that applies the principles of green and smart urbanism. The principles of green urbanism are summarized as: (i) urban planning and transportation, (ii) water and biological resources and (iii) energy and resources (Elkawy and Ahmed, 2023).

- Sustainable Development: Sustainable development has become a prominent global concern, addressing economic, social and environmental aspects. The 2030 development plan, adopted by world leaders at a significant international summit in 2015, outlines 17 sustainable development goals that are now being implemented. Principles of sustainable development are summarized as [38] and serve as guiding principles for achieving a balanced and resilient future. They

Salah, R., Embaby, M. and Okba, E.. (2023). A holistic framework for evaluating qoul linking contemporary planning theories principles. *The Scientific Journal of King Faisal University: Basic and Applied Sciences*, 24(2), 53–60. DOI: 10.37575/b/eng/230045

include: (i) eliminating poverty in all its forms worldwide, (ii) ending hunger, ensuring food security and nutrition, and supporting sustainable agriculture, (iii) promoting healthy lifestyles and well-being for all ages, (iv) ensuring inclusive and equitable high-quality education for all, as well as opportunities for lifelong learning for everyone, (v) working towards gender equality and empowerment for all women and girls, (vi) ensuring universal access to and sustainable management of water and sanitation services, (vii) ensuring universal access to inexpensive, dependable and long-term energy services, (viii) fostering economic and sustainable growth, full and productive employment and decent work for all, (ix) creating resilient infrastructure, promoting inclusive industrialization and fostering innovation, (x) reducing variability within and between countries, (xi) making cities and human settlements inclusive, safe, resilient and sustainable, (xii) ensuring sustainable consumption and production patterns, (xiii) taking urgent action to combat climate change and its impacts, (xiv) preserving the oceans, seas and marine resources and using them in a sustainable manner to achieve sustainable development, (xv) protecting, restoring and promoting sustainable use of terrestrial ecosystems, sustainably managing forests, combating desertification, halting and reversing land degradation and halting biodiversity loss, (xvi) encouraging the establishment of peaceful societies in which no one is marginalized to achieve development and (xvii) providing access to justice for all and building effective, accountable and inclusive institutions at all levels.

3.2. Methodology:

To develop a holistic framework for QOUL, this study employed a structured multimethod approach, as illustrated in Figure 4. The methodology consists of several phases:

- At Phase 1: Review Existing QOUL Structures: This phase involves studying well-known QOUL structures, both subjective and objective, to understand common indicators that are used to assess QOUL.
- At Phase 2: Compare QOUL Indicators with CUPT Principles: Building on Phase 1, this phase compares the identified QOUL indicators with CUPT principles. It identifies any gaps and suggests additional indicators to align the QOUL framework with contemporary planning theories.
- At Phase 3: Develop a Theory-Based Framework: In this phase, a comprehensive framework is created by synthesizing the findings from Phase 2. It establishes a strong connection between QOUL criteria, including indicators, subdimensions, and dimension, and the principles of CUPT.
- At Phase 4: Create a Comprehensive List of QOUL Criteria: Using the framework developed in Phase 3, a comprehensive list of QOUL criteria is generated. Researchers select relevant, reliable, valid, and applicable indicators to effectively evaluate and measure the quality of urban life.

Figure 4. The method research approach of this study
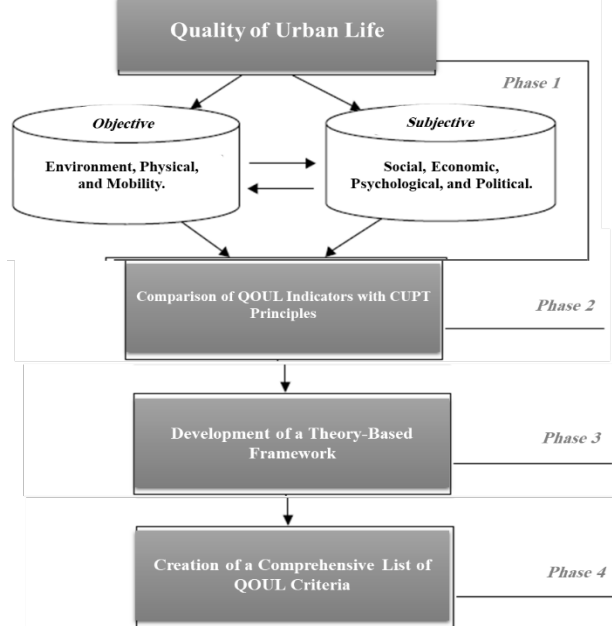
By going through these phases, the methodology ensures a systematic and logical approach to developing a holistic QOUL framework. It

considers existing structures, incorporates contemporary planning theories, and results in a comprehensive list of criteria to evaluate QOUL effectively. The methodology employed in this study ensures a systematic and rigorous approach to developing a holistic QOL framework. By integrating elements from existing QOUL structures and aligning them with contemporary planning theories, the framework provides a structured and comprehensive basis for evaluating QOUL.

4. Results and Discussion

When assessing the QOUL, it is essential to consider both objective and subjective dimensions as equally significant. Therefore, it is crucial to analyse all seven factors simultaneously to capture QOUL accurately. These factors include objective living conditions as well as people's happiness and well-being in each city under analysis. Social and political aspects, which have a significant impact on QOUL, are particularly important subjective indicators to consider during the evaluation process.

4.1. Comparative Analysis:

This study analyses the CUPT, examining both the objective and subjective aspects of QOUL. This includes reviewing the criteria and principles of various theories and their connection to the main dimensions of QOUL, with the aim of effectively measuring QOUL in cities. Initially, a plan was developed to establish the relationship between QOUL indicators, dimensions, and CUPT, as illustrated in Table 5.

Table 5: The proposed structure of QOUL indicators linking CUPT.

		New Urbanism	Smart Growth	Green Urbanism	Sustainable Development
Objective Indicators	Environmental	*Ventilation and natural light.	Preserving critical health and environmental areas. Environmentally friendly residential neighbourhoods.. *Upgrading to green buildings, parks, and smart facilities. Reduce energy use.	Healthy pedestrian paths. A CO$_2$ free city. *Technological innovations that promote the preservation of the urban environment. *Observe guidance.	Clean water and energy. *Reduce energy use. Climate change control. *Upgrading to green buildings, parks, and smart facilities.
	Physical	Preserving the historical areas and historical heritage of the city. Streets hierarchical networks. Mixed land uses.	Compact building design. Pedestrian-friendly residential neighbourhoods. *Smart Pedestrian. *Smart infrastructure. *Smart space.	Housing diversity A healthy, livable city Sustainable transportation. An urban planned city. *Green infrastructure. *Achieving the city's sustainability code.	Green spaces everywhere in the city. A free carbon sustainable city. *Designed for a pollution-free environment.
	Mobility	Interconnected streets. Safe streets.	*Smart Transport infrastructure. Safe transport. * Traffic safety monitoring. *Provides more efficient and intelligent transport systems.	Green pedestrian's sustainable transportation *Green Pedestrian.	*Use clean fuel. *Pedestrians, steps roads and green spaces around. Sustainable transportation.
Subjective Indicators	Social	Enhancing security and safety for the population. Providing services to all residents fairly.	Enhancing a sense of belonging among the population. Integration of residents in the planning decisions of the city. *Digital education and empowerment to work on information and communication technology.	Enhancing the cultural identity and sense of place among the population.	*Public awareness of QOUL. *Flexibility and creativity. *Digital education and empowerment to work on information and communication technology. *Education forever. *Participation in public life.
	Economic	Recycling and economic benefit. *Productivity and entrepreneurship.	Smart economy. *Providing electronic (banking services and shopping)	Recycling and economic benefit. Recruitment of resources. *Productivity and entrepreneurship. *Providing electronic means in commercial operations.	*Global and regional competitiveness. *Providing electronic (banking services and shopping). *Providing electronic means in commercial operations of all kinds. *Productivity and entrepreneurship.
	Psychological		Encouraging the formation of social relationships. Cultural heritage, identity, and sense of place.	Developing community awareness.	*Create a sense of belonging for the city's residents by being involved in all city policies. Create an impression and belonging to the city.
	Political		*Facilitate smart services. *Improve community access to all data. *Develop a modern society characterized by financial and social inclusion.		Policies that support peace and justice Support the policies of private and public companies.
No. of new indicators		2 New indicators	12 New indicators	7 New indicators	15 New indicators
* New indicators.					

Table 5 shows there are new indicators for each comparison, e. g. two new indicators for new urbanism, 12 for smart growth, seven for

green urbanism and 15 for sustainable development. Therefore, the most comprehensive theory of subjective QOUL indicators is sustainable development. Sustainable development included some indicators that traditional QOUL indicators ignored, such as participation in public life and providing electronic means in commercial operations of all kinds. Despite this, it lacks some important objective indicators, such as a smart transport indicator covered by the smart growth theory. The smart growth theory focuses on components of smart, such as transportation and urbanisation, which are not included in the subjective or objective indicators of QUOL. Within its framework principles, the theory of new urbanism does not include environmental, psychological or political indicators of QOUL. According to the green urbanism paradigm, QOUL indicators include transportation and green urbanisation components. Table 5 shows sustainable development principles lead to more humane cities, whereas smart growth and green urbanisation lead to more liveable cities.

Figure 5. a illustrates the proposed objective QOUL indicators, which accurately measure the QOUL indicators in cities. These dimensions consist of six sub-dimensions and 17 indicators derived from CUPT. For example, smart environment and ventilation belong to the environmental dimensions with multiple sub-dimensions of QUOL, whereas smart transport and green transport fall within the mobility dimensions with various sub-dimensions. Furthermore, smart urban and sustainable urban are part of the physical dimensions with several sub-dimensions. In addition, the suggested subjective dimensions include four sub-dimensions with 13 indicators. These include the smart community as the social dimension with several sub-dimensions, the smart sustainable economy as the economic dimension with multiple sub-dimensions and belonging as the psychological dimension with various sub-dimensions of QOUL. These are the proposed objective QOUL indicators, as depicted in Figure 5. b. The social aspect is an essential dimension of QOUL. CPUT acknowledges the importance of social justice, preventing racial discrimination and ensuring fair distribution of resources in developing inclusive and equitable cities. By integrating these principles into the creation of indicators, urban planners can evaluate how well urban environments foster social cohesion, provide equal access to resources and opportunities and eliminate discriminatory practices. This approach ensures that the assessment of urban quality encompasses the community's diverse needs and aspirations, thereby fostering a more inclusive and equitable city for all residents.

The indicator of upgrading to green buildings, parks and smart facilities is repeated in the smart growth and sustainable development in the objective indicators. The subjective indicators also have four repeated indicators, as shown in Figs. 5a and b, respectively.

As demonstrated in the discussions above, it is vital to continuously identify dimensions and indicators and develop public policies that incorporate the elements of QOUL. This approach is crucial for promoting ecologically sustainable, resilient, socially inclusive, safe, and economically productive cities. Policies, plans, planning laws, and regulations for cities should be designed and regularly updated based on evidence-based information that takes into account the relationships between cities and QOUL. By doing so, urban development efforts can effectively prioritise and enhance the overall well-being and quality of life of urban residents.

Figure 5: The proposed QOUL indicators. a) Objective indicators. b) Subjective indicators. The repeated indicators are not highlighted.

(a)

(b)
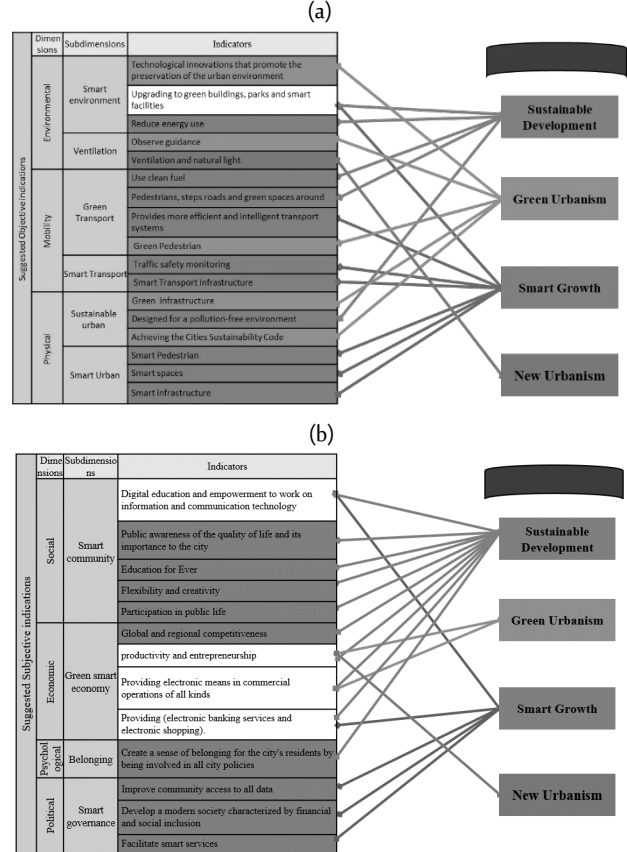
4.2. Proposed Approach to QOUL Indicators:

The criteria deduced from the theoretical study were used to develop the final proposed approach to QOUL, which includes both objective and subjective indicators as depicted in Fig. 6. The result is a holistic proposed framework.

Figure 6: Proposed classified approach to QOUL. (Conventional and suggested indicators.)

Salah, R., Embaby, M. and Okba, E.. (2023). A holistic framework for evaluating qoul linking contemporary planning theories principles. *The Scientific Journal of King Faisal University: Basic and Applied Sciences*, **24**(2), 53–60. DOI: 10.37575/b/eng/230045

5. Conclusion

It is important to include a wide range of characteristics, from the macro (city) to the micro (neighbourhood/building) level, when assessing QOUL. City indicators should be incorporated into existing data collection to allow for continuous monitoring of progress. Indicators of QOUL should consider both objective and subjective factors, with an emphasis on perception and sustainable choices. Though no single theory can account for every facet of QOUL, they all work together to provide a more complete picture.

This study highlights the importance of linking CUPT with indicators used to assess QOUL. By examining CUPT principles and translating them into measurable indicators, this research aims to advance the measurement of QOUL. A comprehensive review and comparative analysis identify gaps and overlaps between existing QOUL indicators and CUPT principles. In conclusion, the proposed framework includes six objective sub-dimensions and four subjective sub-dimensions, encompassing 30 indicators. Finally, a holistic framework provides a comprehensive approach to evaluating QOUL and addresses the limitations of current indicators by incorporating principles from contemporary planning theories. Policymakers and planners working on rural development should prioritize the following:

- Linking QOUL to to CUPT standards allows for regular assessment and improvement of indicators based on societal changes, technological advancements, and emerging planning theories, facilitating continuous monitoring, and enhancing QOUL over time.
- Combining subjective and objective indicators gives a more holistic understanding of QOUL. By providing a comprehensive evaluation of the urban environment, decision makers have a complete picture of the urban environment, enabling them to make informed and effective decisions that address the community's well-being and aspirations.
- Considering subjective indicators ensures that the evaluation of QOUL takes diverse perspectives into consideration and promotes inclusivity and equity in city planning.

Biographies

Riham Salah

Architecture Department, Faculty of Engineering, Canadian International College, Elsheikh Zayed, Giza, Egypt, +201097260990, just.js36@gmail.com, riham_kamel@cic-cairo.com

Dr. Salah is a PhD researcher in Egypt. She obtained a master's degree in urban planning from Al-Azhar University and has served as a teaching assistant for six years at Nahda University in Bani Sweif, Egypt. She currently works as a lecturer assistant at Canadian International College, located in Sheikh Zayed, Giza, Egypt. Her doctoral dissertation focuses on city planning, specifically exploring the application of a novel methodology to enhance the quality of urban life. ORCID: 0000-0002-5383-7723

Mohga Embaby

Architecture Department, Fayoum University, Faculty of Engineering, Fayoum, Egypt, +201020630070, mee01@fayoum.edu.eg

Prof. Embaby is a professor of architecture and environmental design and Vice Dean of the College of Engineering for Education and Student Affairs. She has served as the Head of the Architecture Department at the Faculty of Engineering, Fayoum University. She has also obtained the titles of Doctor of Philosophy and Professor of Architecture and Urban Design. Throughout her career, she has published research papers in various fields, including architectural engineering, communication design, industrial design, graphic design, urban conservation and rehabilitation, urban design, urban planning landscape, urbanism city planning, sustainable urban development and city planning.

Ehab Okba

Architecture Department, Fayoum University, Faculty of Engineering, Fayoum, Egypt,

+201223315636, emo00@fayoum.edu.eg

Prof. Okba is a professor of architecture and environmental design and the Head of the Architecture Department at the Faculty of Engineering, Fayoum University. He is a permanent member of the Promotions Committee of the Supreme Council of Universities in Egypt, director of the investment zone of Fayoum University in New Fayoum City and the former Vice Dean of the College of Engineering for Graduate Studies and Research. He has published research papers on a variety of topics including architectural engineering, geoinformatics, geographic information systems, climatology, geology and sustainable development.

References

Abbate, R., Giambalvo, O. and Milito, A.M. (2001). Service and life quality: The case of Palermo. *Social Indicators Research*, **54**(٣), 275–308. DOI: 10.1023/A:1011032801904

Alvarez, A. and Müller-Eie, D. (2017). Quality of Urban life and its relationship to spatial conditions. *WIT Transactions on Ecology and the Environment*, **223**(25), 285–96. DOI:10.2495/SC170251

Ardestani, L., Choobchian, S., Sadighi, H., Azadi, H., Viira, A.H., Tanaskovik, V. and Kurban, A. (2022). Investigating subjective and objective quality of life in rural areas: The case of Tehran Province in Iran. *Applied Research in Quality of Life*, **n/a**(n/a), 1–32. DOI: 10.1007/s11482-020-09897-0

Bovkir, R., Ustaoglu, E. and Aydinoglu, A.C. (2023). Assessment of urban quality of life index at local scale with different weighting approaches. *Social Indicators Research*, **165**(2), 655–78. DOI: 10.1007/s11205-022-03036-y

Chapman, D.W. and Larkham, P.J. (1999). Urban design, urban quality and the quality of life: Reviewing the department of the environment's urban design campaign. *Journal of Urban Design*, **4**(2), 211–32. DOI: 10.1080/13574809908724447

Chiarini, B., D'Agostino, A., Marzano, E. and Regoli, A. (2021). Air quality in urban areas: Comparing objective and subjective indicators in European countries. *Ecological Indicators*, **121**(n/a), 1–9. DOI: 10.1016/j.ecolind.2020.107144

Cömertler, S. (2017). Greens of the European green capitals. *IOP Conference Series: Materials Science and Engineering*, **245**(5), 52064. DOI: 10.1088/1757-899X/245/5/052064

Cummins, R.A. (2000). Objective and subjective auality of life: An interactive model. *Social Indicators Research*, **52**(1), 55–72. DOI: 10.1023/A:1007027822521

Debrah, C., Owusu-Manu, D.G., Kissi, E., Oduro-Ofori, E. and Edwards, D.J. (2020). Barriers to green cities development in developing countries: evidence from Ghana. *Smart and sustainable built environment*, **11**(3), 438–53. DOI: 10.1108/SASBE-06-2020-0089

Discoli, C., Martini, I., San Juan, G., Barbero, D., Dicroce, L., Ferreyro, C. and Esparza, J. (2014). Methodology aimed at evaluating urban life quality levels. *Sustainable Cities and Society*, **10**(n/a), 140–8. DOI: 10.1016/j.scs.2013.08.002

Duan, J., Liao, J., Liu, J., Gao, X., Shang, A. and Huang, Z. (2023). Evaluating the spatial quality of urban living streets: A case study of hengyang city in central South China. *Sustainability*, **15**(13), 10623.

Elkawy, A. and Ahmed, A. (2023). A framework of EBRD green urbanism program for developing new Egyptian Cities by Using GIS and remote sensing (Case Study: Six October City). *SVU-International Journal of Engineering Sciences and Applications*, **4**(2), 47–75. DOI: 10.21608/SVUSRC.2023.186364.1098

Forsyth, A. (2021). Theories and planning theories. *Journal of the American Planning Association*, **87**(2), 155–8. DOI:10.1080/01944363.2021.1885267

Garau, C. and Pavan, V.M. (2018). Evaluating urban quality: Indicators and assessment tools for smart sustainable cities. *Sustainability*, **10**(3), 575. DOI: 10.3390/su10030575

Gomaa, A.A. and Fouad, F.M. (2022). Taqyim mustawi jawdat alhayaat fi albiyat alhadariat bialmudun aljadidat fi misr (dirasat halati: madinat hadayiq 'uktubar)'Evaluating The Quality of Life in Urban Environments in New Cities in Egypt (Case Study: October Gardens city)'. *Journal of Urban Research*, **46**(1), 47–75. DOI: 10.21608/JUR.2022.123228.1089. [in Arabic]

Grant, J.L. (2019). Vision 20/20: Planning theory and practice, past and future. *Planning Theory and Practice*, **20**(2), 159–62. DOI: 10.1080/14649357.2019.1607217

Kaushik, K. (2018). Dreams of the Smart Cities - a Sustainability Perspective. *Botanica*, **68**(n/a), 60–72.

Koçak Güngör, M. and Terzi, F. (2022). Residential satisfaction and quality of urban life: Examining diverse housing environments. *Archnet-IJAR: International Journal of Architectural Research*. **n/a**(n/a), n/a. DOI: 10.1108/ARCH-01-2022-0014

Kubiszewski, I., Zakariyya, N. and Costanza, R. (2018). Objective and subjective indicators of life satisfaction in Australia: How well do people perceive what supports a good life?. *Ecological Economics*, **154**(n/a), 361–72. DOI: 10.1016/j.ecolecon.2018.08.017

Liu, L., Jensen, M.B. and Zhang, X. (2019). Urban water management in beijing and copenhagen: Sustainability, climate resilience, and the local water balance. *Greening China's Urban Governance: Tackling Environmental and Sustainability Challenges*, **n/a**(n/a), 89–106. DOI: 10.1007/978-981-13-0740-9_5

Liu, S., Guo, H. and Su, L. (2023). Evaluation of quality of life in urban life circles from a composite perspective of subjective needs and the supply of public amenities: A case study of changbai island, shenyang. *Sustainability*, **15**(13), 10095. DOI: 10.3390/su151310095

Liu, W., He, X., Song, L. and Liu, S. (2018). Urban-rural differences in subjective quality of life in Dehui. *Management Theory and Studies for Rural Business and Infrastructure Development*, **40**(4), 563–76.

Lotfi, S. and Koohsari, M.J. (2009). Analyzing accessibility dimension of urban quality of life: Where urban designers face duality between subjective and objective reading of place. *Social Indicators Research*, **94**(n/a), 417–35. DOI: 10.1007/s11205-009-9438-5

Marans, R.W. (2012). Quality of urban life studies: An overview and implications for environment-behaviour research. *Procedia-Social and Behavioral Sciences*, **35**(n/a), 9–22. DOI:10.1016/j.sbspro.2012.02.058

Marans, R.W. (2015). Quality of urban life and environmental sustainability studies: Future linkage opportunities. *Habitat International*, **45**(n/a), 47–52. DOI:10.1016/j.habitatint.2014.06.019

Marans, R.W. and Stimson, R. (2011). An overview of quality of urban life. *Investigating quality of urban life: Theory, methods, and empirical research*, **n/a**(n/a), 1–29. DOI: 10.1007/978-94-007-1742-8_1

McCrea, R. (2007). *Urban Quality of Life: Linking Objective Dimensions and Subjective Evaluations of The Urban Environment*. PhD Thesis, University of Queensland, Queensland, Australia.

Mohamed, R.S., Bakr, A.F. and Anany, Y.M. (2017). New urban indicators for evaluating urban polices in Egypt: City capacity and capability (Capa2). *Procedia Environmental Sciences*, **37**(n/a), 53–67. DOI: 10.1016/j.proenv.2017.03.017

Mulligan, G., Carruthers, J. and Cahill, M. (2004). Urban quality of life and public policy: A survey. *Contributions to Economic Analysis*, **266**(n/a), 729–802. DOI: 10.1108/S0573-8555(2005)0000266024

Murgaš, F. and Klobučník, M. (2018). Quality of life in the city, quality of urban life or well-being in the city: Conceptualization and case study. *Ekológia (Bratislava)*, **37**(2), 183–200. DOI:10.2478/eko-2018-0016

Nassar, U. (2013). Principles of green urbanism: The absent value in Cairo, Egypt. *International Journal of Social Science and Humanity*, **3**(4), 339–43. DOI: 10.7763/IJSSH.2013.V3.258

Okba, E.M, Embaby, M.E and Abd-Almonem, R.M. (2016). Tawjih 'iidarat aleumran min khilal tatbiq watafeil muashirat altanmiat almustadama 'Directing construction management through the application and activating the indicators of sustainable development'. *Journal of the Egyptian Society of Engineers*, **55**(1), 69–82. [in Arabic]

Popescu, A.I. (2020). Long-term city innovation trajectories and quality of urban life. *Sustainability*, **12**(24), 10587. DOI: 10.3390/su122410587

Porter, D.R. (2002). *Making Smart Growth Work*. Washington DC: Urban Land Institute.

Sousa-Gomes, M.C., Luís, R.P.M. and Gomes dos Santos, G. (2010). Quality of life: A reappraisal. *International Journal of Sociology and Social Policy*, **30**(9/10), 559–80. DOI:10.1108/01443331011072307

Sultan, B., Katar, I.M. and Al-Atroush, M.E. (2021). Towards sustainable pedestrian mobility in Riyadh city, Saudi Arabia: A case study. *Sustainable Cities and Society*, **69**(n/a), 102831. DOI: 10.1016/j.scs.2021.102831

Taqi, O.S., Farid, M. and Radwan, A.H. (2021). The importance of quality of urban life indicators in developing new urban communities in cairo. *MEJ. Mansoura Engineering Journal*, **46**(2), 58–66. DOI: 10.21608/bfemu.2021.184361

Van-Kamp, I., Leidelmeijer, K., Marsman, G. and De Hollander, A. (2003). Urban environmental quality and human well-being: Towards a conceptual framework and demarcation of concepts; a literature study. *Landscape and Urban Planning*, **65**(1–2), 5–18. DOI: 10.1016/S0169-2046(02)00232-3

von-Wirth, T., Grêt-Regamey, A. and Stauffacher, M. (2015). Mediating effects between objective and subjective indicators of urban quality of life: Testing specific models for safety and access. *Social Indicators Research*, **122**(1), 189–210. DOI:10.1007/s11205-014-0682-y

Ye, L., Mandpe, S. and Meyer, P.B. (2005). What is "smart growth?"—Really? *Journal of Planning Literature*, **19**(3), 301–15. DOI: 10.1177/0885412204271668