doi: 10.15678/ZP.2021.56.2.05

Zarządzanie Publiczne
Public Governance
No. 2(56)/2021
ISSN 1898-3529

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Sustainable Urban Development and Office Location

Abstract

Objective: The paper explores the criteria of selecting a location for new office projects by developers, as well as analyses them in relation to the principles of sustainable urban development. Real estate market's participants should be part of the sustainable urban development process due to the impact of the built environment on cities' functioning. The overall research question has been about whether there is an intersection between the need for sustainable urban development and locational preferences of office developers.

Research Design & Methods: The paper discusses results of qualitative research (semi-structured interviews) among office developers in Cracow. The focus of the research has been narrowed down to selected aspects of the complex relations between the real estate market and urban development, namely the location of office buildings.

Findings: The developers emphasised access to well-developed public transportation networks as well as access to urban amenities and services as crucial features of good location, attractive for end-users. Thus, the attractive location of an office building is, to large extent, consistent with the principles of sustainable urban development.

Implications/Recommendations: The research findings emphasise the significance of the market participants' awareness of the concept of urban sustainability, as this leads them to exert pressure on developers to create more sustainable buildings and choose more adequate locations. Furthermore, local sustainable urban development strategies and policies create a framework for developers to make more sustainable choices of location.

Contribution/Value Added: This is an original contribution to knowledge on the dynamically-growing office market in Cracow, which I am hoping to have achieved by means of revealing developers' office location preferences as well confronting these preferences with the urban sustainability requirements. The article broadens the analysis of office location preferences by adding the context of urban sustainability. Due to the significance of these findings for urban development, the research opens opportunities for further analysis on a more comprehensive sample.

Keywords: sustainable urban development, office location, office developer, semi-structured interview, commercial real estate

Article classification: research article

JEL classification: R3; O18; Q01; Q56

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Introduction

Accelerating urbanisation is a fact. Scientific discourse and development policies focus on the quality of urban growth rather than mere facilitation of it, and the concept of sustainable development has been incorporated into urban development policies, since this seems to be the best solution to the negative consequences of economic growth nowadays. The concept of sustainable urban development (Hassan & Lee, 2014) raises expectations as to more healthy, aesthetic, safe, economically-viable, clean, ecologically-unburdening, human-scale cities. The Bruntland Report (WCED, 1987) included the first commonly accepted definition of sustainable development that "meets the needs of the present without compromising the ability of future generations to meet their own needs". The concept of sustainability also inspired the transformation of the economic and social growth paradigm into the sustainable growth paradigm based on the principles of intergenerational, intra-generational, geographical, procedural, and interspecies equity (Haughton, 1999).

The paper follows the essential assumption of the gravity of the influence of the built environment on sustainable urban development (Braun, Cajias, & Hohenstatt, 2017). Commercial buildings not only shape physical urban structure and impact the natural urban environment (carbon footprint, use of natural resources, building materials, waste), but they also impact urban mobility and urban economy. The office sector reacted to its responsibilities towards the environment by constructing sustainable buildings, whose negative ecological impacts are minimised. However, sustainable office buildings (Kibert, 2013; Shiers, 2000; Zuo & Zhao, 2014) – which became the prevailing type of office in the so-called developed countries – still generate urban problems, namely increased traffic, disorder in urban functions (homogenous urban districts negatively influencing urban sustainability both socially and economically), and environmental disruption in the area (air corridors, burden to natural habitat). Thus, the analysis of impacts of the real estate sector on urban sustainability should be extended to cover the urban perspective, as the single-buildings approach is not sufficient. In this context, we analyse the city–building relations based on the location of a building, whose consequences impact the natural environment, transportation capacity, and land use in cities. The primary focus of the research is on the attributes which make an office building attractive for users and investors. The existing literature reports the high significance of an office's transportation accessibility (Adnan, Daud, & Razali, 2015; Remøy & van der Voodt, 2014), access to urban amenities (Rebelo, 2011), and prestige of location (Harris, 2016; Levy & Peterson, 2013) but cost-related factors have also been noted to impact location decisions (Appel-Meulenbroek, 2008). However, the influence of office location on urban environment has been seriously under-explored.

Despite a large body of research and literature on office location, as well as on urban sustainability, there exists considerable research gap, which this study attempts to fill. Namely, the concept of sustainable office location has not been clearly defined so far, nor has it been investigated. Sustainable location has been analysed in few studies, with reference to facility location and with focus on large-scale, industrial, specialised public or private facilities (An et al., 2015; Fischetti, Ljubic, & Sinnl, 2017). Raising a business's environmental awareness prompted the extension of the criteria for selecting a location with sustainability aspects (Rao et al., 2015). With reference to urban sustainability, the location of facilities should be planned and selected with the consideration of economic, social, and environmental consequences (Hammad, Akbarnezhad, & Rey, 2017; Izadikhah & Saen, 2016). There have been attempts to define sustainable residential location and the analysis focused on mobility patterns and transportation costs as main factors of the impact on environment, economy, and the quality of life (Tischler & Mailer, 2016). In several studies, sustainable location of industrial facilities have been investigated, but the research explicitly dealing with social, economic,

and environmental impact on urban sustainability of office location is extremely rare or non-existent, or else it deals with narrowly-defined issues (e.g. Aarhus, 2000). Even in sustainable buildings certification schemes, location categories are of minor significance, but it could be assumed that responsible investors and users would consciously select locations in a socially- and environmentally-responsible manner. However, the body of research which could confirm this is very limited. Only Smith and Bereitschaft (2016) analysed actual locations of projects rated according to LEED-ND[1] (USGBC, 2016), and concluded that most sustainable locations of LEED-ND projects were within densely urbanised areas, especially central areas of large cities and metropolitan regions, marked by public transportation accessibility, walkability, diversity of uses, and re-use of land (infill and brownfield development).

The aim of the paper is twofold. It seeks to reveal the developers' criteria of selecting new office projects' location. The analysis of urban sustainability principles (with focus on those referring to the location of urban functions and the organisation of transport) makes it possible to assume what the features of sustainable office location should be. The ultimate goal of this article is to set office location criteria against urban sustainability principles in order to conclude on the possible compatibilities between the real estate market's needs and the requirements for sustainable urban development.

The analysis is consists of five sections. Following the introduction, the next section provides the theoretical framework for the analysis. For research purposes, based on literature review, spatial attributes of the sustainable city are identified. To build foundation for empirical research and to strengthen assumptions regarding the existing compatibilities between office market participants' needs and the requirements of sustainable urban development, a thorough literature review on office location has been conducted as well as crucial attributes of an attractive office have been identified and classified. The next section presents the methodology – qualitative research conducted in Cracow's office market, i.e. among office developers' representatives who had developed or were in the process of developing 75% of modern office stock in the city. The subsequent section presents and discusses developers' preferences for new office locations in Cracow, with special attention paid to 'sustainable' location attributes in the subsection on research findings. The study concludes with a number of closing remarks.

Literature review

Sustainable development is a globally acknowledged model for urban development (European Commission, 2010; United Nations, 2016), which includes the principles of the concept of sustainable development as well as complements economic growth with environmental and social aspects (Fu & Zhang, 2017). Based on the principle of equity, sustainable urban development balances economic development, with environmental considerations and social issues taken on board. Urban sustainability – the desired state of urban development – consists of several interweaving and interdependent dimensions: economics, ecology, culture (or social issues), and politics (James et al., 2015). The spatial aspects of urban sustainability, significant for this research, are included into environmental or socio-economic issues of sustainable urban polices (Hassan & Lee, 2014; Turcu, 2013) and they cover matters connected with built environment, transportation networks, public spaces, land use, city structure, urban sprawl, and location of urban functions. Thus, the fundamental attributes of environmentally-sustainable city could be narrowed down to the density of the urban form and the diversity of functions (mixed-use) on the one hand, and to accessibility to public transport and non-motorised

[1] The LEED Neighbourhood Development certification system is not applied to rating developments in Poland, as is also the case with the BREEAM Communities, which evaluates the sustainability of developments, but not of single buildings.

transportation system on the other (Wheeler, 1996). The aspects of density and diversity originate from the concept of compact city (Lim & Kain, 2016), in which walkable, dense, diversified districts are not only economically-, but also socially- and environmentally- sustainable due to their proximity to urban services and jobs, the minimised use of car for transportation, the shortening of commuting time, higher energy and resource efficiency, and improved socialising (Cho & Rodriguez, 2015). Public transportation – the accessibility of well-developed networks – is of crucial significance for a city's ecological footprint.

The physical location of an office, which is a part of an investment and corporate strategy of the real estate market's participants (Telega & Zięba, 2016), also impacts urban development by an increased demand for transportation facilities, urban amenities, ecological footprint, and impact on land-use structure, among other things.

This paper focuses on the criteria of location-related decisions for new office projects rather than on the very decision-making process. The real estate industry considers location as one of the crucial variables in achieving investment profits.

Business location refers to a *general location* within a country, region or city and *site selection (exact location)* determined by specific attributes of parcel of land and its location within an urban area (Rymarzak & Siemińska, 2012). Here, we focus on the exact location within a specific urban area. Site selection criteria for new office projects have been subject to several studies, and the categories of location-related factors that are highly valued by demand-representing end-users are well recognised.

The analysis of hitherto conducted research on offices' locations makes it possible to categorise important locations' attributes. These include: **accessibility** (transportation, infrastructure, services, networks), **proximity** (to central business district and agglomeration economies, business services, to employees, suppliers, and customers), the **availability** of amenities, facilities, and urban services, the **quality of the area** (prestige, status, symbolic meaning of a location), and the influence of **planning and fiscal tools** and public investments (local government interventions) (Rebelo, 2011).

In the light of fast and intensive urbanisation, the **accessibility** of corporate office has become the first and most important feature of contemporary office. Accessibility – understood as connectivity and centrality (Willigers & Van Wee, 2011) provided by public transportation networks, availability of transport options, and commuting distance and time – has been the crucial aspect of an office's market attractiveness, and it is the feature common for all types of offices, places of work and organisations. This has been sufficiently confirmed by research (Adnan, Daud, & Razali, 2015; Appel-Meulenbroek, 2008; Archer & Smith, 2003; Gluszak & Zięba, 2016; Greenhalgh, 2008; Jennen & Brounen, 2009; Leishman et al., 2003; Manzato et al., 2011; Remøy & van der Voodt, 2014; Safian & Nawawi, 2013). The significance of the accessibility of a corporate office is a logical consequence of the organisation of white-collar work, which requires regular commuting to office buildings in routine working time and in fast growing metropolises; this critically strains transportation system.

Users of offices are leaning towards locations that provide direct access to urban **amenities**, inner city facilities, local and urban services, which consist of recreational facilities, healthcare, shopping, childcare, restaurants, urban greenery, local administration, banking and post services (Adnan, Daud, & Razali, 2012, 2015; Adnan & Daud, 2010; Rebelo, 2011; Remøy & van der Voodt, 2014). Despite differences in requirements between large and small organisations, accessibility to amenities is rather universal (Remøy & van der Voodt, 2014).

Business aspects of location accessibility relates to **proximity** to employees, suppliers and customers and business services as well access to **positive externalities** ensuing from concentration of various business activities (Adnan, Daud, & Razali, 2012, 2015; Adnan & Daud, 2010; Dettwiler, 2008; Fagg, 1980; Greenhalgh, 2008; Jennen & Brounen, 2009;

Leone & Struyk, 1976; Mun & Hutchinson, 1995; Rebelo, 2011; Remøy & van der Voodt, 2014). Agglomeration economies in the form of horizontal relations and intra-industrial concentrations play more important role in determination of location patterns in urban areas (He & Romanos, 2016).

Location of an office in a specific urban area for many organisations has been part of their market image and reputation. Consequently, **prestige of location**, symbolic meaning of a location, safety, quality of neighbourhood, visibility have been significant criteria for site selection (Adnan, Daud, & Razali, 2012, 2015; Appel-Meulenbroek, 2008; Greenhalgh, 2008; Harris, 2016; Krätke, 1992; Levy & Peterson, 2013; Rebelo, 2011; Remøy & van der Voodt, 2014; Rymarzak & Siemińska, 2012). The features making a location prestigious have been changing. In most cases, however, it is the central urban location (Central Business Districts) which is considered the prime location that tends to attract large multinational corporations able to pay higher rents, aware and attentive of their market reputation.

Additionally, a location's economic aspects – i.e. its impact on investment efficiency as well as its costs and value – are taken into account when making location-related choices; the decision to choose corporate office and its location is made based on cost factors (Appel-Meulenbroek, 2008; Gluszak & Zięba, 2016; Leishman, Orr, & Pellegrini-Masini, 2012; Rymarzak & Siemińska, 2012; Adnan, Daud, & Razali, 2015). 'Cost factors' or 'total occupancy costs' include rent levels, operational and maintenance costs; fit-out costs are remarkably more important for smaller organisations, more vulnerable to financial burdens (Levy & Peterson, 2013). The cost of energy constitutes the most significant share of maintenance costs, hence the energy performance of a building tops the list of the most desired attributes of an office. Total occupancy costs tend to increase in central business districts with rising rent level in premium locations. Demand for central locations is part of self-reinforcing pattern, i.e. a central location draws companies which highly value prestige and transportation as well as the 'urban comfort' of a site, hence pushing rents up and thus pushing away less affluent tenants (Remøy & van der Voodt, 2014; Adnan, Daud, & Razali, 2015). Cost factors may gain on significance in relation to the phase of business cycle (external economic conditions), whereby the economic recession fosters a selection of suburban, less costly offices, while in times of the economic boom, companies' market position is expanding (in particular, knowledge-intensive firms are inclined to relocate to city cores or business parks) (Dettwiler, 2008).

The needs of the end-users generally determine the criteria of selecting a new office location by investors and developers. And even in the case of sustainable buildings (i.e. offices marked by higher and stricter sustainability standards), these criteria typically focus on transportation accessibility and the proximity to urban amenities and services (Adnan, Daud, & Razali, 2015; Adnan & Daud, 2010) (Adnan, Daud, & Razali, 2012) as well as the overall 'economic aspects of location', such as proximity to clients (Remøy & van der Voodt, 2014).

Research methodology

Investigating developers' criteria for selecting an office location for new projects that would be compatible with urban sustainability is part of broader research on the sustainability of office locations in Cracow.

There has been research on sustainable sites for new office projects in one of Cracow's districts (Telega & Zięba, 2016), with application of spatial research tools, but it did not include the enquiry into decision-making criteria which are important for developers. Thus, the lack of knowledge about office location preferences expressed by office developers motivated the author to conduct qualitative research in order to reveal location-related preferences.

In the Polish office market, dominated by the capital city Warsaw (58% of the total office stock in the country), Cracow, being second largest

city, is also the second biggest office market among the group of 8 'regional cities', with 9,8% of the country's office stock in mid-2016 (Kołodziejczyk, 2016). The growth of the city office stock has been immense, with cumulative supply doubled in the period of 2012–2017 (Knight Frank, 2017). Being a major location of BPO services in Poland, the city's economy benefits from new investments and inflow of people and capital, but the city also struggles with traffic congestions, extreme air pollution, increasing house prices, and real estate market pressures on releasing sites for new construction. With the ecological and social burdens of the city's economic growth, the issue of sustainable urban development becomes critical.

Semi-structured interviews were selected as method for this research. Unstructured interviews would not have provided comparable answers, whereas standardised interviews could have led to biased results if important decision-making criteria had not been included into alternative responses. The application of open-ended questions in interviews allows respondents to freely express their opinions and raise issues relevant to questions. Typically, when more intensive study of motivations and perceptions is conducted, a more flexible approach – less structured interviews – is more appropriate (Selltiz et al., 1967). It is, however, more time-consuming method, which requires specific knowledge on the part of the interviewer. Semi-structured interviews were an appropriate choice, especially since the size of the research sample was small – a limited number of developers operating in office market in Cracow – and the researcher possesses knowledge about the topic. This method had already been applied in research focused on the identification of preferences in the real estate market (tenants, users, etc.) (Safian & Nawawi, 2013).

The semi-structured interviews were conducted with experts who represented (as project managers) commercial developers in Cracow. The interviews were carried out between January and March 2017. The criteria for selecting developers were that they develop modern office space, with office buildings certified with one of green certificates (e.g. BREEAM, LEED). The interviewed developers operate according to the same scheme: they make investment decisions, manage projects development, commercialise office space, and manage operating buildings until a decision on the sale (typically to an investment fund) is made after several years of operation. Only green office developments were under scrutiny here, as sustainable office buildings allow the developers to assume a higher level of the environmental awareness. The one-to-one interviews were conducted with 3 office developers' representatives in Cracow (out of 6 green office developers identified).

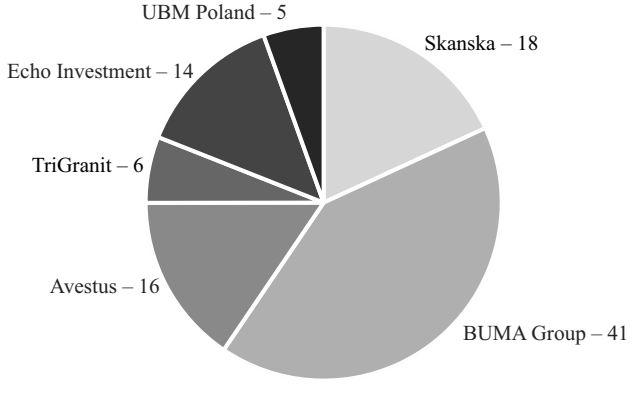

Figure 1. Developers and their share of green office space in Cracow as for March 2017 (in %)

Source: Own calculation by Author based on information published by developers.

The share of 3 developers: Avestus, BUMA Group, and Skanska (Figure 1) in office projects makes the sample representative for office market in the city. There were – existent or under construction – 29 green office building in Cracow; total sustainable net office space in the market equalled 383 298 square metres at the time of research. Total office space in Cracow at the end of 2016 was estimated at 916 000 square metres (Knight Frank, 2017), so green office space under research makes for 31% of total office space in the city.

The three developers (Table 1) have developed or are in the process of developing office projects, which – in terms of their share in total green office space in Cracow – make 75% of available (and under construction or planned) certified office space, and are responsible for 21 new office projects in Cracow.

The first interviewee was an international developer operating in Central and Eastern Europe. The second one was from a major development and construction company operating worldwide. The third developer represented a major local company, i.e. a commercial and residential developer based in Cracow and operating since 1991.

The interviewees were informed about the general purpose of the interviews, i.e. the identification of the criteria for site selection for new green office projects. The questions had not been shared before the interview so that the experts could express their views without being biased. Also, more spontaneous answers revealed crucial locational factors or barriers in project development. On average, the interviews lasted between 40 and 80 minutes.

The interviews started with a general question about the main motive for certification of office buildings, for which we wanted a spontaneous answer and so we did not suggest any answer. This was followed by some more specific questions. Introductory questions (Questions 1 to 3; see Appendix) investigated motivations for certification, as we assumed these would reveal the developers' environmental awareness and the degree to which certification and the selection of location is the consequence of market motivations or/and conscious decisions to certificate buildings and select locations that contribute to sustainable development. The latter, detailed questions (Questions 4 to 6; see Appendix) reflected factors – as revealed by numerous research and analysed in the Literature Review section – typically representing the most attractive location attributes of an office and locations important to office users. The assumption behind these questions was that developers, being conscious of tenants and users' needs, realise new project in a location which is likely to be the most attractive one in a given area.

Table 1. The characteristics of interviewees – developers

Interviewees	Net green office space (in square metres)	Number of buildings	Certification system	Share of Cracow's green office market space
Developer 1	59 388	6 (in 1 location)	BREEAM (very good)	15.5%
Developer 2	69 457	5 (in 3 locations)	LEED (Gold or Platinum)	18.1%
Developer 3	158 551	10 (in 4 locations)	BREEAM (very good or excellent)	41.4%
All 3 developers	287 396	21		75.0%

Source: Own calculation by Author based on information provided by Developers.

Discussion

Criteria of office location in Cracow – findings from the interviews

The answer to the first, general question by two of the respondents proved that the decision to develop green buildings is motivated by *"tenants expectations"* or *'market expectations'*. Only Developer 2, who emphasised strong attachment to CSR policy and environmental consideration as a major cause for green-certification declared *'social and environmental considerations'* to be the main reason for certification, while other motives were tenants' and investors' requirements. For this one developer, sustainable development, the impact on the surrounding area, and the place-making were equally important. Additional spontaneous remarks revealed that, because of competition in the market and rising standards of office buildings, it is not just certificate that is important, but also its high level matters.

The relation between certification and site selection is rather insignificant – Developers 1 and 3 stated that location selection is not influenced by certification requirements. Only Developer 2 confirmed complying with some of the requirements, e.g. area of site that allows for provision of open green space, which may increase certification level. Minimum standards for any level of BREEAM certification do not require the fulfilment of location-related criteria.

The answer to the first of a series of detailed questions, one on project site selection, was unanimous – location must be attractive for tenants' needs and for investors, and this attractiveness is measured above all by **public transportation accessibility**, which is fully in line with research results worldwide (e.g. Adnan, Daud, & Razali, 2015; Remøy & van der Voodt, 2014). In case of downtown (Developer 2) and central location, crucial is access by public transportation, and in Cracow, accessibility of tramlines is most preferred, which means 10–15 minutes walking distance from a tram stop to the project site. A convenient and attractive location means that buildings' end-users commute up to 30 minutes by public transportation. Projects located less centrally (the case of some projects by Developer 3) are easily accessible also by car, as their are situated nearby major transit roads, but also close to a tram network. Access to cycling network has not been stated as crucial, although all developers provide facilities for bikers. Answers to the question on **parking spaces' availability** clearly indicate a relationship between the location and the significance of parking availability: the closer to the city centre (and thus better accessed by public transportation) the location is, the less important the provision for parking spaces. Of lower significance is inter-city and international accessibility (airport, motorway, intercity trains), which was explained by in terms of the type of tenants (mainly BPOs) and the form of modern work (remote, online). In this regard, also access to tenants' clients has not been stated as significant.

In a densely built-up and historic city such as Cracow, appropriate land for new office construction is scarce, and developers admit that the selection of the sites was also governed by the physical and legal availability of a site for new development. Most preferred are sites with the existent **'land-use plan'**, as this makes administrative preparatory procedures simpler and less time-consuming. Without an existing land-use plan, completing administrative procedures can last up to 3 years. For some developers, a site without land-use plan will not even be considered for purchase and development, for others – if it is attractive and without any legal ownership defects, it can be considered for development, especially that some sites with land-use plan tend to be overpriced in the local market. There were some additional remarks from developers concerning infrastructure and planning policy. As a major obstacle, the city's planning policy was mentioned, which tends to be chaotic and lacks a long-term strategic approach. Insufficient activity of city authorities in strategic planning and in the implementation of transportation amenities can pose a major barrier in near future

when it comes to further development of Cracow's office market. The interviewed developers also indicated the inconsistency between the city's planning policy and urban sustainability goals; in local land-use plans that define conditions for new construction, the number of parking spaces is defined as the required minimum, whereas certification systems give more credits to projects with maximum limits of parking spaces. Not only is it inconsistent with sustainable urban development (encouragement to use a car), but it also points to the underestimation of the city's transportation issues.

As the literature review suggests, the attractiveness of a location for office tenants is influenced by its **accessibility to various urban amenities and services** (e.g. Adnan, Daud, & Razali, 2015; Rebelo, 2011. However, local developers do not confirm this location feature as being crucial. Their tenants rarely need access to urban services (administrative, financial, hotels, posts, banks, etc.) and if the required amenities are not provided in the neighbourhood, they provide some services in their projects. The availability of food courts, biking facilities, recreational facilities, kindergartens, medical facilities, ATMs, and groceries is a must; typically, parts of office projects (ground floors) are leased out to providers of such services.

The broadly defined **'quality of area' –** i.e. the prestige, safety, cleanness, quality, and standard of the surrounding architecture – is not a crucial selection criterium, apart from basic issues such as cleanness and safety (neglected areas or areas with bad reputation are not considered for new office projects). This partly reflects preferences revealed in previous research worldwide (Adnan, Daud, & Razali, 2015; Appel-Meulenbroek, 2008; Levy & Peterson, 2013). However, the fact that the prestige of location is more significant only for projects located centrally – in the most appreciated locations in Cracow (close to the historic downtown) – is in line with global trends, where prime locations are selected by high-end and image-aware tenants. Buildings provided by developers there are marked by the highest standards and targeted at corporations' headquarters rather than BPOs. Most office projects are evaluated based on their functionality and efficiency of space, not on the visual or aesthetic aspects of architecture. For marketing purposes, it is important that location should make tenants' logos visible ('*first-row buildings*'). Only one of the interviewed developers mentioned the significance of careful landscaping and site planning, as well as the creation of public space with greenery open to the whole local community. The respondents emphasise place-making as the inevitable part of project similarly to engagement in local community activities. All the interviewed representatives were aware of the necessity to communicate and, in case of conflicting issues, negotiate with stakeholders; they are also open to 'green and sustainability' innovations if these emerge and are demanded by tenants (e.g. bee hives on roofs, sports facilities for end-users, cultural and ecological activities). However, only one of the developers is initiating such activities.

Location preferences of developers' office projects

The criteria of making a decision about the location for a new office project in Cracow is similar to common office preferences in developed office markets. As reflected in the literature review, office developers who answer the needs of end users, locate their projects in areas with good transportation accessibility, with preference for public transportation network and access to urban amenities and business services are considered in terms of locational prestige. The preferences in Cracow's office market (summarised in Table 2) reflect some specific features of the city, i.e. the unavailability of historic centre for new office construction and the lack of a typical Central Business District, resulting in offices being more dispersed across the city, though the most prestigious locations surround the city centre. The latter is the consequence of highly-developed public

transportation network around the city centre. The non-existence of underground in Cracow makes tram the most desired transportation means. Due to the scarcity of land available for new developments, even sites not covered by local zoning plans might be considered as appropriate for new construction. Access to urban amenities and services is not crucial in Cracow, which can be attributed to a relative density of the urban structure and the diversification of urban functions. Hence their proximity in most locations and the developers' eagerness to provide services on-site.

Some of the findings undermine the assumption that developers of green office buildings are also more environmentally-conscious market participants; their decisions to develop green buildings is the result of their recognition of tenants' requirements and does not involve their willingness to contribute to more sustainable urban development. However, based on their opinions, the real estate market's participants can make a positive contribution to urban sustainability in an indirect way. Office developers highly value sites covered by local zoning plans; they appreciate consistent, long-term transportation infrastructure investment policies of the local government; they search for locations accessible by public transportation and provide biking facilities; they pay attention to access to diversified urban functions; and they value safety and aesthetics. All these attributes of a good office location represent also the attributes of sustainable cities: the prevailing use of clean modes of transport (public transportation), walkability (proximity), and the diversity of uses and functions. Furthermore, developers are aware of end-users' requirements and are open to innovations (ecological, social, or referring to new ways of working). This leads us to two crucial findings. First, if the pressure from tenants/end-users is on the buildings' locational features that are likewise important from the urban sustainability perspective, the developers are eager to provide them. Second, the results of the conducted interviews emphasise the local government's huge responsibility for sustainable urban development. By careful spatial planning and developing a public transportation network, the local government could attract office developments to locations which are compatible with the rules of sustainable urban development.

Table 2. Summarised preferences of office developers in Cracow, referring to most attractive locations for new projects

Attributes of an attractive location for new office projects	Developers' preferences
Public transportation accessibility	Crucial. Most preferred: tram access, tram stops close to the site, numerous tram lines
Sites covered by local zoning maps	Most preferred. Legal status as a additional decisive factor
Availability of parking	Important only in city-fringe, suburban locations
Access to urban amenities and services	Important, not crucial. Many facilities and services provided 'on site' by developers
Quality of area and prestige	Of relative significance, dependent on target tenants
Access to a cycling network	Of relative significance
Access to customers	Important only in central locations and most prestigious projects
Costs and rents	Acceptable relations between costs of land-site and local rents

Source: Author's own elaboration based on the interviews' results.

Concluding remarks

This paper explored the locational attributes of new office projects, as they are significant for the market attractiveness of office buildings from the developers' perspective. Assuming that the location of new office buildings impacts the functioning of a city, it is substantial to know whether the needs and preferences of the real estate market's participants are in line with the principles of sustainable urban development, or if they contradict them. Studying decisions from the real estate market in the perspective of their impact on sustainable urban development contributes substantially to studies on urban development and the real estate market's responsibilities for it.

This research focused on Cracow's office market – the second largest real estate market in Poland, with significant modern office stock, to which newest additions consist mostly of certified sustainable buildings. Being a rapidly growing metropolis, Cracow is also facing the universal challenges of accelerated urban growth: traffic congestion, air pollution, or insufficient amount of green and recreational sites. Thus, it has to respond to these pressures in order to balance economic growth with environmental and social development.

The research sample included representatives (project managers responsible for investments in site selection) of three major office developers, which have developed and operate 75% of sustainable office stock in the city. The research included only developers of sustainable office stock, as this made it possible to reach the goal of exploring the attributes of attractive office location as well as examining whether developers' decision on green certification resulted from their awareness of sustainable development, or not. Semi-structured interviews was the method selected for in-depth analysis of the location criteria and rationale for certification, and it allowed the interviewees to express additional spontaneous opinions on urban and office market developments. The interview included preliminary questions on rationale for certification and on the relation between location choice and certification requirements. A common rationale for certification has been market pressure from tenants, with only one developer additionally emphasising his environmental and social commitments. The Location and Transport categories of certification were not of critical significance, but they do not belong to mandatory criteria during the certification process and are of minor weigh in the final evaluation of the level of green certificate. This finding, though not unanticipated, raises an issue whether the certification systems should not be modified to adjust better to the requirements of sustainable urban development as well as to pressure for more social and environmental awareness when making office investments. These preliminary issues were followed by detailed questions on location attributes which are the most important for new investments' site selection.

Results of previous research made it possible to identify criteria of attractive location for a contemporary office, and the preferences in Cracow's market are consistent with those findings – the most important seems to be such a location of an office that has good public transportation accessibility. Good access to diversified urban amenities and services has been seen as important but not crucial, which, according to the respondents, is the consequence of the diversification of functions in many of their projects, where buildings include ground-floor retail and services. Many tenants also value prestige and the visibility of location, and, accordingly, the developers respond with appropriate supply. The specific urban structure of Cracow – with its densely built-up historic centre – results in the lack of a typical Central Business District, and new office developments are concentrated in locations surrounding the centre. Non-central locations are concentrated in proximity to major intra-city transportation routes, to public transportation network, and in areas with well-developed urban amenities and services.

The selected method also produced freely expressed opinions about office locations in

Cracow, and an additional valuable result emerged – the significance of planning policies and local transportation policies as well as that of infrastructural investments of the local government for office investment decisions has been confirmed. Thus, the role of policy, strategy, and local development instruments has been established. Concluding – the local development strategy focused on sustainable goals and the consecutive development instruments of local governments not only contributed to urban sustainability but are also welcomed by developers, providing them with precise information on transportation network development, potential for urban amenities development, as well as, most importantly, information on land use.

The density of urban form, the diversity of urban functions, and public transportation connectivity are among crucial spatial requirements of sustainable urban development, but, as the results of this research prove, this aspects are also among the most significant criteria of an attractive office location: access to public transportation and access to amenities and services. However, in most cases, the selection of a sustainable location is not the result of the developers' environmental awareness but, rather, it is a consequence of market pressure.

Study results which show how commercial goals of real estate developers do not contradict the principles of sustainable urban development are of major significance for the creation of urban development strategies and solutions, and also for the real estate market's participants. This is probably the most important contribution of the study for practitioners, especially local governments. The research method also led to additional conclusions, significant for the practitioners and researchers of sustainability and building certification systems – if included in mandatory categories, locational categories would enhance positive contribution to sustainable urban development.

The research fills the knowledge gap on sustainable location and its market attractiveness for real estate developers and office-users. The outcomes of previous pilot research focused on the spatial analysis of most sustainable locations for new offices (Telega & Zięba, 2016), and results of this study confirm the validity of the assumption that with proper planning policies, adjusted certification systems, and the pressure from tenants, developers deliver office buildings which do not contradict the spatial principles of sustainable urban development. The study is unique in that it relates the real estate market's participants' needs to the requirements of urban sustainability as well as it contributes to studies on sustainable urban development and its spatial aspects. It is also applicable to studies on real estate market developments and it introduces the concept of sustainable location to research on office markets in urban areas.

By confirming the initial assumption that the real estate market's needs are consistent with sustainable urban development, the research lays foundation for a further, broader investigation of sustainable office locations, which are not only attractive for office-users, but also compatible with urban sustainability goals.

However, there are some limitations to this study, mainly the limited sample of interviewees and a relatively narrow spatial coverage of their office investments. Furthermore, the application of a single qualitative research method does not make it possible to model the most sustainable office location (and yet market-attractive) in the city subject to research. Further research, conducted after the global COVID-19 pandemic, should verify whether the profoundly impactful pandemic consequences influenced office location and the quality of office space. Especially interesting would be an inquiry into whether the pandemic urged companies to be more socially- and environmentally-responsible in their investments and operational activities. Some preliminary research suggests socio-economic and spatial structures in cities, which is why the location of various functions bears some responsibility for the spread of the virus (Hamidi, Sabouri, & Ewing, 2020; Tricarico & De Vidovich, 2021).

It is worthwhile to continue this research by extending research sample to more developers in Cracow, and to other Polish cities. Particular attention should be paid to the spatial consequences of office market location choices, as well as on the impact on sustainable urban development. Thus, further research should include the application of geospatial and quantitative tools in order to investigate relations between office buildings in a specific location and the flow of passengers, cars, ecological burdens (e.g. heat islands), or land-use mix. It should also lead to the modeling of sustainable office locations. Additionally, further research directions should focus more on the environmental awareness of developers and office users. Pursuing this field of research has huge practical significance and could really enhance the quality of urban development and planning policies as well as contribute to sustainable urban development.

Acknowledgements

The research has been founded from Statutory Research funds for 2018 for the Department of Real Estate Economics and Investment Process, Cracow University of Economics.

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Appendix: Structure of the interview

1. Why was the building's green certification decided? For what reasons?
   a) market pressure (marketing aspects)
   b) environmental considerations
   c) customers' expectations
   d) economic and financial considerations (lower costs, higher value, lower risk)
   e) company's policy (CSR, sustainable development, image, prestige)
2. Did the building certification requirements influence the selection of locations, and to what extent?
   a) have any criteria from the Transport or Land Use and Ecology category been met?

3. What criteria of the certification system were the most difficult to meet? Did they relate to the choice of location?
4. Why have specific locations been selected? Which features of the locations under consideration were the most important?
   a) local zoning plan (the ease and time of obtaining a building permit)
   b) availability of the plot (supply of space for development)
   c) price of the plot and rents in this area
   d) transport accessibility (public transportation and green modes of transport)
      i. public transport
      ii. train / agglomeration railway
      iii. biking
   e) walking
   f) possibility of parking and private car access
   g) mix use (of space) in the area
   h) proximity to other similar objects
   i) the proximity of the centre (amenities, services in the centre, administration, retail, gastronomy, hotels, etc.)
   j) the proximity of clients and contractors
   k) the proximity of the station/airport/highway
   l) prestige of the location (architecture, public space, visual and aesthetic quality)
   m) visibility of the building
   n) quality of the area (cleanliness, no nuisance)
   o) security
   p) other?
5. What non-economic factors were taken into account when selecting the location (stakeholders' needs):
   a) proximity to residential areas – YES / NO
   b) commuting time of employees – YES / NO
   c) car access / parking options – YES / NO
   d) availability of facilities for employees
      • bar, restaurant
      • shops
      • health care facilities
      • gym
      • park
      • kindergarten, school
      • other?
   e) impact on the neighbourhood (greenery, noise, shading, public space, historical surroundings) – environmental decisions and voluntary involvement of the investor in social investment
6. Other location criteria?