



prof. dr hab. Elżbieta Ura

ORCID: 0000-0001-6896-6790

e-mail: eura@ur.edu.pl

Instytut Nauk Prawnych

Uniwersytet Rzeszowski

The role of local government in creating smart cities

Rola władz lokalnych w tworzeniu inteligentnych miast

Abstract

The aim of the article is to draw attention to the issue of using modern technologies to create smart cities, also known as 15-minute cities or compact cities. Many such cities already exist worldwide, and others draw inspiration from their models. In Poland as well, efforts are being made to create smart cities that guarantee both sustainable development and an improvement in the quality of life for residents. In this regard, the primary role rests with local governments.

The concept of a smart city was emphasized in the 2015 United Nations resolution called Agenda 2030, which highlights that the changes introduced in the functioning of cities are meant to promote social cohesion. The principles outlined in Agenda 2030 have the support of the European Commission, among other things, in the “Horizon Europe” program. The concept of a smart city revolves around ensuring that every resident has access to basic life necessities within a 15-minute walking or cycling distance from their home or by using public transport.

The fundamental thesis arising from the above considerations is that actions aimed at creating smart cities have an impact on the sustainable environmental, social, and economic development, while also carrying risks that may limit residents’ rights and threaten their privacy.

Keywords: sustainable development, Agenda 2030, smart city, local government.

Streszczenie

Celem artykułu jest zwrócenie uwagi na zagadnienia związane z wykorzystaniem nowoczesnych technologii w celu tworzenia miast inteligentnych, zwanych też miastami 15-minutowymi lub miastami kompaktowymi. Na świecie funkcjonuje już wiele takich miast, a wzorce z nich czerpią inne. Również w Polsce dąży się do tworzenia miast inteligentnych, które gwarantują jednocześnie zrównoważony rozwój i poprawę jakości życia mieszkańców. W tym zakresie podstawowa rola spoczywa na samorządach lokalnych.

Idea miasta inteligentnego podkreślona została w rezolucji ONZ z 2015 roku, zwanej Agendą 2030, w której podkreśla się, że wprowadzane zmiany w funkcjonowaniu miast mają sprzyjać spójności społecznej. Założenia zawarte w Agendzie 2030 znajdują poparcie Komisji Europejskiej m.in. w programie „Horyzont Europa”. Założeniem smart city jest, by każdy mieszkaniec miał dostęp do podstawowych potrzeb życiowych w odległości 15 minut pieszo lub rowerem od domu albo korzystając z transportu publicznego.

Podstawowa teza na tle powyższych rozważań wykazuje, że działania ukierunkowane na tworzenie miast inteligentnych wpływają na zrównoważony rozwój środowiska, społeczny i ekonomiczny, a jednocześnie niosą ze sobą zagrożenia mogące ograniczać prawa mieszkańców i zagrażać ich prywatności.

Słowa kluczowe: zrównoważony rozwój, Agenda 2030, miasto inteligentne, samorząd lokalny.

1. Introduction

Smart city is a term that has gained popularity in recent years and refers to the creation of a sustainable, innovative, and efficient urban environment by local governments. The goal of creating such cities is to improve the quality of life for residents, enhance the efficiency of urban services, and promote sustainable economic and social development.

The beginnings of smart city development are closely tied to the emergence of new digital technologies and the Internet. At this stage, the focus was primarily on digitizing municipal services and urban infrastructure. The first smart cities, such as Amsterdam, Barcelona, and Singapore, began their transformation by implementing solutions like e-government, networked public transportation systems, and digital waste management systems. In the next stage, the development of smart cities is linked to the emergence of new technologies such as the Internet of Things (IoT), cloud computing, big data, and artificial intelligence. This period of change is referred to as the fourth industrial revolution, characterized by the transfer of decision-making from humans to machines¹.

Cities started to utilize these technologies to integrate various aspects of urban life, create real-time city management systems, and collect and analyse large amounts of urban data. The goal was not only to increase efficiency but also to enhance the quality of life for residents. This is achieved by combining the concepts of smart cities with the idea of sustainable development. Digital technology is used not only to improve the efficiency and quality of urban services but also to promote sustainable economic, social, and environmental development. Through

¹ M. Metrycki, *Czwarta rewolucja przemysłowa musi się dokonać przede wszystkim w naszych umysłach* [in:] K. Schwab, *Czwarta rewolucja przemysłowa*, Polish edition, Publ. house Studio Emka, Warszawa 2018, p. 14.

digital technologies, local governments can better understand the needs of their residents, optimize resources, enhance the efficiency of municipal services, and respond to problems in real time. For example, using data collected by IoT sensors, local governments can monitor air quality, the state of urban infrastructure, noise levels, or traffic flow, enabling quick and effective decision-making.

The sustainable development of cities was a leading topic in the 2015 UN resolution “Transforming our world: the 2030 Agenda for Sustainable Development”, also known as Agenda 2030². Agenda 2030 is understood as a plan of action aimed at determining pathways for global development by defining 17 Sustainable Development Goals and the associated 169 tasks, which point to the three dimensions of sustainable development: economic, social, and environmental. Regarding changes in the functioning of cities, the Agenda declares, “We will work with local authorities and communities to renew and plan our cities and human settlements in a manner that promotes social cohesion and personal safety, and stimulates innovation and employment. We will reduce the negative impacts of urbanization and the use of chemicals that are hazardous to human health and the environment, including through safe and environmentally friendly chemical management, waste reduction, recycling, and more efficient use of water and energy. We will also work to minimize the impact of cities on the global climate system”.

The aim of the considerations is to draw attention to the implementation of tasks by local governments aimed at creating smart cities, also known as 15-minute cities. This issue will be presented in the context of analysing international legal solutions and national law. To illustrate the actions of local government in this regard, examples of changes introduced in cities towards making them smart cities will be provided.

2. Sustainable urban development in legal regulations

Agenda 2030 was adopted by the United Nations General Assembly in New York on September 25–27, 2015. It was signed by 193 UN member states, including Poland. Its principles regarding the creation of smart cities, recognizing sustainable urban and territorial development as crucial for achieving sustainable development and well-being for all, were subsequently reaffirmed at the United Nations Conference held in Quito, Ecuador, from October 17–20, 2016 (Habitat III). The outcome of its deliberations is the “New Urban Agenda: Declaration

² <https://sdgs.un.org/2030agenda> [access: 26.09.2023].

on Sustainable Cities and Human Settlements for All”³. The new program for cities adopted at this conference includes guidelines for local and regional governments, among other things, to help cities around the world become greener, safer, more prosperous, and more conducive to social integration.

EU regulations also point to sustainable development, emphasizing environmental protection requirements (Article 11 of the Treaty on the Functioning of the European Union⁴), sustainable progress in all relevant sectors (Article 26, paragraph 3), and sustainable economic growth (Article 3, paragraph 3 of the Treaty on European Union⁵). Sustainable development is also addressed in the provisions of many EU directives⁶, and soft law acts⁷.

It's also worth mentioning the “Horizon Europe”⁸ program, under which, on September 29, 2021, the European Commission launched five missions aimed at improving the quality of life for residents. One of these missions is related to creating climate-neutral, resilient, and smart cities by the end of this decade.

In addition to EU and international law, sustainable development is also emphasized in Article 5 of the Constitution of the Republic of Poland. According to this article, “The Republic of Poland shall safeguard the independence and integrity of its territory, ensure the freedoms and rights of persons and citizens, safeguard the national heritage, and shall ensure the protection of the environment, guided by the principle of sustainable development”. J. Zimmermann rightly argues that these constitutional provisions and the emphasis on “sustainable development” in them do not apply “only to environmental protection but also, at least, to national heritage and the freedoms and rights of citizens”⁹. This means that it has a universal dimension, not just an individual one¹⁰.

³ <https://habitat3.org/wp-content/uploads/NUA-Polish.pdf>; https://ec.europa.eu/regional_policy/sources/policy/themes/urban-development/agenda/eu-urban-agenda-infographics.pdf [access: 27.02.2023].

⁴ Journal of Laws from 2004, No. 90, item 864/2.

⁵ Journal of Laws from 2004, No. 90, item 864/30.

⁶ For example, Regulation (EU) 2017/1601 of the European Parliament and of the Council of 26 September 2017 on the establishment of the European Fund for Sustainable Development (EFSD), the EFSD Guarantee and the EFSD Guarantee Fund (OJEU L of 27 September 2017, 2017.249.1); Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources (OJEU L of 5 June 2009).

⁷ For example, Communication from the Commission to the Member States of 2 September 2004 establishing guidelines for a community initiative in the field of trans-European cooperation aimed at promoting the harmonious and sustainable development of the European area (OJEU C of 10 September 2004, 2004.226.62).

⁸ <https://www.kpk.gov.pl/horyzont-europa> [access: 17.06.2023].

⁹ J. Zimmermann, *Prawo administracyjne*, 8th edition, Wolters Kluwer 2020, p. 151.

¹⁰ B. Rakoczy [in:] Z. Bukowski, E.K. Czech, K. Karpus, B. Rakoczy, *Prawo ochrony środowiska. Komentarz*, Warszawa 2013, p. 20; see also: P. Korzeniowski, *Zasady prawne ochrony środowiska*, Łódź 2010, p. 279–331; Z. Bukowski, *Zrównoważony rozwój w systemie prawa*, Toruń 2009;

3. The smart city concept according to Carlos Moreno

The concept of the smart city, according to the vision of the French-Colombian urban scholar Carlos Moreno, who has pioneered groundbreaking work on creating smart cities, is for every resident to have access to their basic life needs within a 15-minute walk or bike ride from their home. This is aimed at combating the dominance of cars and creating more human-centered and sustainable urban spaces that prioritize people's needs. Moreno argues that reducing people's dependency on vehicles can help limit carbon dioxide emissions and air pollution, ultimately improving both human health and the condition of the planet¹¹. This concept was developed to reduce pollution emissions in transportation¹². Typical solutions in line with C. Moreno's concept include nurturing green spaces, limiting car traffic in city centres, narrowing roads, and designating bike lanes at the expense of car lanes, as well as more advanced measures related to expanding recreational infrastructure, local health facilities, schools, markets, and more.

Carlos Moreno's concept has given rise to a new urban planning trend based on the proximity of essential points for meeting needs within a 15-minute walk or bike ride, known as "human-centered design". According to this approach, the immediate vicinity should include service points such as hair salons, post offices, shops, cafes, restaurants, parks, recreational areas, schools, kindergartens, workplaces such as offices, healthcare facilities, cultural centers, and public transportation stops. The close proximity of such points is intended to encourage residents to choose walking or biking over cars, leading to a more active lifestyle, time savings compared to commuting, and reduced time spent searching for parking spaces. The reduced reliance on cars would also decrease carbon dioxide emissions, protect the environment, and improve biodiversity. These are mainly the aspects highlighted in the 2030 Agenda as outcomes of a smart city that considers sustainable development.

4. Examples of smart cities

Anna Hidalgo, the Mayor of Paris, utilized Carlos Moreno's concept during her re-election campaign in 2020, advocating for the idea that "In Paris, we all have

E.K. Czech, *Publiczne prawa podmiotowe do środowiska podmiotów korzystających ze środowiska*, Białystok 2021, p. 97–106.

¹¹ <https://konkret24.tvn24.pl/swiat/15-minutowe-miasta-ograniczenia-kamery-i-limity-wjazdu-wielopietrowa-manipulacja-6813960>; <https://wyborcza.pl/7,75968,29038608,miasto-15-minutowe-ideologia-i-praktyka-watpliwie-sukcesy-paryza.html> [access: 27.09.2023].

¹² <https://wyborcza.pl/7,75968,29038608,miasto-15-minutowe-ideologia-i-praktyka-watpliwie-sukcesy-paryza.html> [access: 10.03.2023].

a sense of missing time and are constantly in a hurry. That's why I am convinced that we need to redesign our city in such a way that its residents can learn, engage in sports, and access healthcare within a 15-minute walk from their homes"¹³.

Singapore is considered one of the smartest cities in the world. The city leverages technology to improve the quality of life for its residents by efficiently managing resources, promoting innovation, and creating a green and sustainable urban space.

Amsterdam is a leader in innovation and data utilization. The city has established the "Amsterdam Smart City" platform, facilitating collaboration among residents, businesses, scientists, and local government to develop smart urban solutions. The "City Data" platform aggregates various types of data, including information about public spaces, buildings, traffic, healthcare, environment, permits, and grants, ensuring transparency in the actions of local and government authorities. Amsterdam also has an intelligent street lighting control system, allowing energy consumption reduction by dimming lights during low-traffic hours and in less critical areas. In this smart city, 32% of traffic occurs on bicycles, and 63% of residents use bicycles daily, thanks to well-developed and safe infrastructure, including 400 km of bike lanes and dedicated parking facilities¹⁴.

Barcelona is implementing the concept of "superblocks" (*superilles*) with increased recreational areas around them as part of its smart city development¹⁵.

The implementation of the 15-minute city concept in Oxford (population: 150,000) began in 2015 with the introduction of traffic filters, which are cameras recognizing license plates. The next stage involves "climate lockdowns"¹⁶. The plan divides Oxford into six 15-minute neighbourhoods, and according to the proposals, a resident will only be allowed to travel outside their neighbourhood for 100 days a year. If anyone from Oxford exceeds this limit, they will be fined £70 each time. Furthermore, every resident will be required to register their car with the County Council. If a family has two or more cars, they can receive a total of 100 permits. Residents of the rest of Oxfordshire County can apply for permits to pass through a chosen filter for 25 days a year.

¹³ <https://www.transport-publiczny.pl/wiadomosci/nowa-koncepcja-znana-z-przeszlosci-czym-jest-15minutowe-miasto-77772.html>; https://www.c40knowledgehub.org/s/article/Why-every-city-can-benefit-from-a-15-minute-city-vision?language=en_US [access: 25.09.2023].

¹⁴ <https://www.tokfm.pl/Tokfm/7,172871,25517596,amsterdam-to-nie-tylko-rowery-to-swiatowy-lider-w-rozwoju-smart.html> [access: 25.09.2023].

¹⁵ <https://www.theguardian.com/cities/2016/may/17/superblocks-rescue-barcelona-spain-plan-give-streets-back-residents> [access: 25.09.2023].

¹⁶ <https://www.salon24.pl/u/niewiarygodne/1274483,miasta> [access: 10.03.2023].

The city of Canterbury (approximately 45,000 residents) is to be divided into 5 zones. The rules of the city's operation will be similar to those in Oxford, with the exception that there will be no possibility of travel between zones. To access the neighbouring zone, one will have to exit onto the ring road and continue on foot or by bicycle.

In both cities, there will be no restrictions in place regarding medical services, public transportation, or store supplies.

Residents of Oxford are rebelling against these provisions, organizing demonstrations in which they proclaim slogans that this leads to the restriction of citizens' freedoms, the creation of ghettos, and will lead to the bankruptcy of businesses¹⁷.

In Poland, the concept of a 15-minute city was introduced in February 2023 by the Mayor of Warsaw, R. Trzaskowski, during the presentation of the rail transport project. The project envisions that by 2050, the metro will reach almost all neighbourhoods, and over half of the residents will have a metro station within a kilometre of their residence. "The entire study aims to implement the concept of a 15-minute city so that every Warsaw resident can access all the essential services via public transportation or on foot"¹⁸.

The first city in Poland to implement the concept of a 15-minute city is considered to be Pleszew¹⁹.

In Krakow, the "Klimatyczny Kwartał" ("Climate Quarter") project is being carried out in the Kazimierz district and parts of Grzegórzki, which aims to realize the idea of a 15-minute city. The project's organizers explain that the actions within the project are meant to provide residents with the opportunity to "meet all their life needs" "in the immediate vicinity of their place of residence, without the need for unnecessary long-distance travel"²⁰. They should be able to do their daily shopping, pursue hobbies, and meet with friends within a distance that can be covered within 15 minutes on foot or by bicycle.

¹⁷ <https://pch24.pl/brytyjskie-miasto-15-minutowe-pod-ostrzalem-mieszkanicy-oxfordu-ponownie-protestuja/>; <https://wpolityce.pl/swiat/635006-mieszkanicy-oxfordu-protestuja-przeciwko-specjalnym-strefom> [access: [access: 13.06.2023].

¹⁸ <https://um.warszawa.pl/-/stolica-pieciu-linii-metra> [access: 12.06.2023].

¹⁹ Statement from the mayor of the city: "We have utilized the natural conditions of Pleszew to make it a 15-minute city. We are pursuing a city development policy based on compactness, where everything is within a few minutes' reach for residents – by walking, cycling, or public transport", <https://gloswielkopolski.pl/pierwsze-15minutowe-miasto-w-polsce-jest-w-wielkopolsce-brytyjczycy-sa-nim-zachwyceni/ar/c1-17442845> [access: 12.06.2023]. In May 2023, Pleszew was awarded as the first compact city in Poland in the "Innovative Local Government" competition, <https://pleszew.naszemiasto.pl/tag/innowacyjny-samorzad-2023> [access: 13.06.2023].

²⁰ <https://ztp.krakow.pl/miasto-15-minutowe/klimatyczny-kwartal> [access: 11.06.2023].

5. Summary

There is no doubt that technology, societal needs, and environmental challenges are factors influencing the development and shaping of smart cities. The process of creating such cities evolves, starting from the initial attempts at digitization, through integrated city management systems, to the current approach of creating sustainable and smart city governance. This direction was also highlighted by the COVID-19 pandemic, which began in 2020. At that time, there was a need to increase the digitization of urban services, remote communication, and management. Smart cities are envisioned to be capable of responding to crises while also considering the well-being of their residents, ultimately aiming to achieve the principle of sustainable development.

The examples provided illustrate that many cities around the world actively harness technology to promote sustainable development, as evidenced by the use of renewable energy, promotion of electric mobility, and waste management.

However, the creation of smart cities requires local governments to undertake various initiatives and face numerous challenges. This includes investments in technological infrastructure, transformation in public administration, education, and increasing digital awareness among residents, data management and privacy considerations, as well as cross-sector collaboration and cooperation with the private sector.

When highlighting the benefits of transforming cities, it cannot go unnoticed that it comes with various risks. A smart city that utilizes the latest technologies is vulnerable to cyberattacks and unauthorized use of data. Consequently, the personal data of residents may be compromised. Additionally, it must be taken into account that not all residents will be able to use the Internet to address their needs in government offices or for social purposes. This may lead to the gradual exclusion of certain social groups (such as the poor, disabled, or elderly). Therefore, in the pursuit of transforming cities, local authorities must not forget about these risks.

In conclusion, one can quote the words of A. Przegalińska: “The latest technologies, merging the digital, physical, and biological worlds, are radically changing our civilization. New possibilities in medicine, education, or business improve human existence on Earth [...]. At the same time, they prove to be potentially very dangerous, opening up vast spaces for cybercrime or contributing to further societal polarization”²¹.

²¹ A. Przegalińska [in:] *Rekomendacje do książki K. Schwaba..., op. cit.*, p. 2.

Analysing the presented principles, one can probably say that the idea of a smart city itself, and the goals presented as its justification, are valid. The 15-minute city concept will not only make it easier for residents to handle basic matters within the so-called “reach of hand” but will also have a positive impact on the environment. However, uncontrolled implementation of new technologies and digital management systems can lead to a limitation of residents’ freedom of movement and full control (monitoring) over them. Adopting the Oxford model will result in dividing the city.

The discussion about 15-minute cities in Poland is already taking place in the public sphere²², and it is not always favourable to these ideas.

Bibliography

Bukowski Z., *Zrównoważony rozwój w systemie prawa*, Toruń 2009.

Czech E.K., *Publiczne prawa podmiotowe do środowiska podmiotów korzystających ze środowiska*, Białystok 2021.

https://ec.europa.eu/regional_policy/sources/policy/themes/urban-development/agenda/eu-urban-agenda-infographics.pdf.

<https://gloswielkopolski.pl/pierwsze-15minutowe-miasto-w-polsce-jest-w-wielkopolsce-brytyjczyca-sa-nim-zachwyceni/ar/c1-17442845>.

<https://habitat3.org/wp-content/uploads/NUA-Polish.pdf>.

<https://konkret24.tvn24.pl/swiat/15-minutowe-miasta-ograniczenia-kamery-i-limity-wjazdu-wielopietrowa-manipulacja-6813960>.

<https://pch24.pl/brytyjskie-miasto-15-minutowe-pod-ostrzałem-mieszkańcy-oxfordu-ponownie-protestują/>.

<https://wpolityce.pl/swiat/635006-mieszkańcy-oxfordu-protestują-przeciwko-specjalnym-strefom>.

<https://pleszew.naszemiasto.pl/tag/innowacyjni-samorząd-2023>.

<https://sdgs.un.org/2030agenda>.

<https://um.warszawa.pl/-/stolica-pieciu-linii-metra>.

https://www.c40knowledgehub.org/s/article/Why-every-city-can-benefit-from-a-15-minute-city-vision?language=en_US.

<https://www.kpk.gov.pl/horyzont-europa>.

<https://www.polityka.pl/tygodnikpolityka/swiat/2203998,1,zabiora-nam-auta-15-minutowe-miasto-czyli-zamach-na-wolnosc.read>.

<https://www.salon24.pl/u/niewiarygodne/1274483,miasta>.

<https://www.theguardian.com/cities/2016/may/17/superblocks-rescue-barcelona-spain-plan-give-streets-back-residents>.

<https://www.tokfm.pl/Tokfm/7,172871,25517596,amsterdam-to-nie-tylko-rowery-to-swiatowy-lider-w-rozwoju-smart.html>.

<https://www.transport-publiczny.pl/wiadomosci/nowa-koncepcja-znana-z-przeszlosci-czym-jest-15minutowe-miasto-77772.html>.

²² <https://www.polityka.pl/tygodnikpolityka/swiat/2203998,1,zabiora-nam-auta-15-minutowe-miasto-czyli-zamach-na-wolnosc.read> [access: 13.06.2023].

- <https://wyborcza.pl/7,75968,29038608,miasto-15-minutowe-ideologia-i-praktyka-watpliwie-sukcesy-paryza.html>.
- <https://ztp.krakow.pl/miasto-15-minutowe/klimatyczny-kwartal>.
- Korzeniowski P., *Zasady prawne ochrony środowiska*, Łódź 2010.
- Metrycki M., *Czwarta rewolucja przemysłowa musi się dokonać przede wszystkim w naszych umysłach* [in:] K. Schwab, *Czwarta rewolucja przemysłowa*, Polish edition, Publ. house Studio Emka, Warszawa 2018.
- Przegalińska A. [in:] *Rekomendacje do książki K. Schwaba, Czwarta rewolucja przemysłowa*, Polish edition, Publ. house Studio Emka, Warszawa 2018.
- Rakoczy B. [in:] Z. Bukowski, E.K. Czech, K. Karpus, B. Rakoczy, *Prawo ochrony środowiska. Komentarz*, Warszawa 2013.
- Schwab K., *Czwarta rewolucja przemysłowa*, Warszawa 2018.
- Zimmemann J., *Prawo administracyjne*, 8th ed., Wolters Kluwer 2020.