

Changes in Poland that influence architectural education and access to the profession

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ABSTRACT: The Polish system of higher education is undergoing a process of transformation. A new law shaping architectural curricula was introduced in July 2019. Analysis has been carried out in this research to determine the impact of that law on the knowledge, skills and competence of young architects in Poland. The author compared the new legal requirements with similar standards in well-developed educational systems in the USA and the United Kingdom. The consequence of the analysis was to link the subject under study with another overarching issue, i.e. the coherence of legal requirements that shape the education system, with separate provisions that define the criteria for accessing the architectural profession. The study findings have revealed there are inconsistencies in contemporary Polish legislation. As a result of the study, necessary reforms were identified.

INTRODUCTION

Frequent changes of the Polish legal system affect higher education, including university curricula for architecture courses [1]. In July 2019, an ordinance defining the education standards for the architectural profession came into force in Poland [2][3]. The effect of this ordinance was to amend and expand the requirements included in the previous regulation from 2011 [4]. The changes were to meet the requirements of the Directive 2005/36/EC of the European Parliament and of the Council on the recognition of professional qualifications of architecture students for practising in the profession.

The changes were to supplement regulations drafted in the years 2014-2019 [5-7]. The amendments raised numerous doubts expressed in the public consultation process [8]. These concern the effects of implementing new provisions, among them defining guidelines for new curricula and the pace of drafting new curricula. They also relate to the increasing student workload and the provisions governing access to the profession.

Changes introduced in the education system of architecture should correspond to changing environmental, socio-economic, technical and legal conditions, the expectations of clients and increased professional responsibility [9]. The goal of this study was to answer the question of whether new legal requirements set better standards that contribute to the modernisation of the education system for architects in Poland. It is also important to answer the question of whether these solutions will help Polish universities compete against those with the highest standards of architectural education in the world.

CHANGES IN POLAND COMPARED TO THE USA AND THE UK

System Changes in Poland

This study has been divided into sections. The first section features analysis of the new legal standards concerning education in the architectural profession, as compared with previous regulations. The objective of the analysis was to define key differences and their impact on university curricula in Poland.

The collection of necessary information was required to carry out the analysis. Based on the structure of the legal acts, the data were identified as:

- The type of graduated courses required to pursue a professional licence in architecture.
- Minimum required number of course semesters.
- Minimum required number of contact hours.

- Defining curriculum requirements and their scope.

The analysis was confined to full-time courses. The information is presented in Table 1. The legal requirements that were made stricter in 2019, in Poland, have been marked in italics.

Table 1: Requirements concerning university curricula for architecture students in Poland - 2011 and 2019 regulations.

Regulations from 2011	Regulations from 2019
Type of course:	
Two-cycle architecture course	Two-cycle or <i>long-cycle</i> Master of Architecture course
Number of semesters:	
First-cycle studies: 7 semesters minimum Second-tier studies: 3 semesters minimum	First-cycle studies: <i>8 semesters minimum</i> Second-cycle studies: 3 semesters minimum or <i>long-cycle studies: 11 or 12 semesters</i>
Contact hours/European Credit Transfer and Accumulation System (ECTS):	
First-cycle studies: min. 2,500 h/210 ^{ECTS} Second-cycle studies: minimum 900 h/90 ^{ECTS}	First-cycle studies: minimum 2,800 h/240 ^{ECTS} Second-cycle studies: minimum 1,000 h/90 ^{ECTS} or long-cycle studies: 3,800 h/360 ^{ECTS}
Curriculum requirements, their drafting method and scope	
First-cycle studies (groups of content): 1. Basic content, i.e. mathematics, descriptive geometry, building physics, structural mechanics; 2. Core content, i.e. basics of architectural design, urban design, history of architecture and urban planning, building construction and materials science, building structural systems, building services, visual arts and professional tools, the economics of the real estate development process, organisation of the real estate development process, construction law, professional ethics; 3. Supplemental content, i.e. foreign languages, information technology, humanist content, intellectual property protection, work health and safety.	First-cycle studies (<i>groups of classes</i>): 1. <i>Group of classes</i> - design, i.e. architectural and urban design, <i>rural, interior, and specialist, site-specific design</i> ; 2. <i>Group of classes</i> - context of design, i.e. <i>theory and history of architecture and urban planning, landscape architecture, heritage conservation, culture studies, environmental protection and ecology, law in the real estate development process, the economics of the real estate development process, ergonomics, engineering and technology: construction and materials science, building structural systems, statics and structural mechanics, building physics, building services and urban infrastructure, design toolset: drawing, painting, professional techniques, computer-aided design, modelling, mathematics, geometry</i> ; 3. <i>Group of classes</i> - complementary classes, i.e. in particular, foreign languages and (optionally) <i>philosophy and aesthetics, history of art, sociology and environmental psychology</i> ; 4. <i>Group of classes</i> - diploma project and examination preparation.
Second-cycle studies (groups of content): 1. Basic content - no requirements; 2. Core content: architectural design, urban design, heritage conservation, spatial and regional planning.	Second-cycle studies (<i>groups of classes</i>): 1. <i>Group of classes</i> - design, i.e. architectural and urban design; <i>Spatial planning and design for conservation, and specialist context-specific design</i> ; 2. <i>Group of classes</i> - context of design, i.e. theory and history of architecture and urban design, <i>landscape architecture, heritage conservation, culture studies, archaeology and heritage conservation theory, law in the real estate development process, professional ethics, ergonomics, engineering and technology: technical aspects of the design process</i> ; 3. <i>Group of classes</i> - complementary classes, i.e. in particular, foreign languages and (optionally) <i>philosophy and aesthetics, history of art, sociology and environmental psychology</i> ; 4. <i>Group of classes</i> - diploma project and examination preparation.
Long-cycle studies: not applicable	<i>Long-cycle studies: substantive scope identical for first- and second-cycle studies combined.</i>
Mid-cycle professional training:	
Practical training during first-cycle studies: minimum of 4 weeks - training programme specifics at the discretion of the university.	Practical training during first-cycle studies: <i>5 weeks-technique training, including plain-air drawing sessions and surveying training (building and urban survey); 1 semester of practical training at an architectural office - no earlier than after the fourth semester of study.</i>

Key differences resulting from the changes in the Polish education system include:

- extended minimum education time, from the present 10 semesters to 11 or 12 semesters;
- increased minimum number of contact hours, from 3,400 to 3,800 (plus semester-long period of training);

- increase in the minimum amount of ECTS credits awarded, from 300 to 330 (in two-cycle courses) or 360 (in long-cycle courses), with practical training during an additional semester of study awarded 30 ECTS credits;
- replacement of previous basic and core curriculum content with four new separate groups of classes;
- requirement to draft within one year the new curricula adapted to the amended legal regulations.

The changes resulted in a greater load placed on students by newly formulated curricula. The minimum number of ECTS credits for two-cycle studies was not changed significantly, because the slight increase largely is the result of adding an extra semester of practical training. However, it would be difficult to assume that student workload will remain the same due to the increase in contact hours and the expanded curriculum content.

Frameworks for Teaching Architecture in the USA and the UK

In the second part of the study, the new Polish education standards were evaluated by contrasting them with other, well-established and well-rated education systems. Based on international university and architecture school rankings [10][11], the author selected American and British schools. The analysis of curriculum requirements was limited to the essential elements, assuming the scope of necessary information was analogous to the scope presented in Table 1. The information collected is presented in Tables 2 and 3.

Table 2: Essential requirements for architecture course curricula in the USA.

	Applicable regulations (2019)
Types of courses	First-cycle architecture course minimum (Bachelor of Architecture) - possibility of alternative solutions, i.e. combining other related first-cycle courses with the second-cycle course (Master of Architecture).
Number of years	Minimum of 5 years of education required
Number of credit hours	Minimum 150 credit hours
Curriculum requirements, how they are established and their scope	NCARB (National Council of Architectural Registration Boards) education standard with six subject areas and categories along with NAAB (National Architectural Accrediting Board) programme and student criteria concerning following six fields of knowledge: <ol style="list-style-type: none"> 1. Communication skills; 2. History and theory and human behaviour; 3. Building practices, i.e. structural systems, environmental control systems, construction materials and assemblies, building service and building enclosure systems, technical documentation, financial considerations; 4. Design, i.e. fundamental design, programming and site design, research and investigative based design, integrated design; 5. Professional practice i.e. stakeholder roles in architecture, project management, business management, laws and regulations, ethics and professional conduct; 6. Optional studies.
Mid-course practical training	Practical training is not obligatory, but is available, sometimes organised by the university as a part of the required as part of the required architectural experience programme (AXP supervised by NCARB).

Table 3: Essential requirements for architecture course curricula in the UK.

	Applicable regulations (2019)
Types of courses	Two-part consecutive studies: Part 1 - a university undergraduate degree (e.g. Bachelor of Architecture or equivalent); Part 2 - enhanced architectural knowledge in the form of two-year full-time university degree (e.g. Master of Architecture or equivalent); possibility of alternative solutions that combine studying and practical training, such as the <i>earn and learn</i> approach, jointly organised by universities and leading architectural practices participating in the programme as registered training providers.
Number of years	Requires a minimum of 5 years of study
Number of ECTS/UK CH	300 ECTS/600 UK credits
Curriculum requirements, how they are established and their scope	ARB (Architects Registration Board) general criteria at parts 1 and 2 concerning following 11 fields of knowledge: <ol style="list-style-type: none"> 1. Architectural design; 2. History and theory of architecture; 3. Fine arts; 4. Urban design and planning; 5. People and environment relationship; 6. Role of architect; 7. Brief analysis - preparation for the design project;

	8. Structure, construction and engineering design; 9. Physical problems and technologies; 10. Design skills to meet building users' requirements; 11. Industry context and project delivery.
Mid-course practical training	Highly recommended by ARB, the Royal Institute of British Architects (RIBA) and required by many schools of architecture: minimum 1 year of apprenticeship between part 1 and part 2.

Initial comparison of the Polish with American and British systems demonstrated a much greater autonomy of the USA and the UK schools in designing their curricula. These curricula are not designed on detailed requirements concerning types of classes, but on generally defined teaching criteria. The comparison also highlights another important element of the education system. It is the need to co-ordinate university education with the principles of non-university vocational education and the criteria for access to the profession.

Academic Teaching, Vocational Teaching and Access to the Architectural Profession

Based on analysis of the results of part 1 and 2, it was necessary to collect additional information for the third part of the study. This information concerned the functioning of vocational training, identifying entities responsible for designing the teaching across all of its stages and the access to the profession. Information collected pertaining to the Polish, American and British systems is presented in Tables 4 to 6.

Table 4: Requirements concerning access to the profession and the entity responsible for defining the teaching process and professional licensing in Poland.

	General system solutions determining the teaching and licensing process applicable in Poland in the years 2002-2019.
Condition of access to the profession	Graduation from a Master's course in architecture; Completion of professional training (in accordance with the provisions described below); Passing a licensing examination.
Entity in charge of studio curriculum design	Universities, in accordance with the ordinance of the Minister of Science and Higher Education (Table 1).
Entity in charge of the practical training programme and the method of its execution	Parliament (through acts of law) via general guidelines, i.e.: <ul style="list-style-type: none"> • Until 2014 - 1 year of experience at a construction site and 2 years of design experience in an architectural office; • From 2014 - 1 year of experience at a construction site and 1 year of design experience in an architectural office; • From 2019 - following guidelines for 2014, allowing for the inclusion of mid-cycle practical training after the third year of study. Minister in charge of construction, via ordinance: <ul style="list-style-type: none"> • Specifications concerning documenting the type of building and scope of work fulfilled during practical training both at a construction site and in design.
Entity	Examining body: National Chamber of Architects (scope of examination concerns acts of law and technical knowledge); Licensing body: National Chamber of Architects; Licence registry keeper: National Chamber of Architects; Professional association: National Chamber of Architects (memberships obligatory in order to practice the profession).

Table 5: Requirements concerning access to the profession and the entity responsible for defining the teaching process and professional licensing in the USA.

	General system solutions determining the teaching and licensing process applicable in the US in the years 2002-2019 (in some of 50 USA jurisdictions requirements may vary)
Condition of access to the profession	University-level education (as listed in Table 2). Completion of professional training (in accordance with the regulations described below). Passing a licensing examination and obtaining a state licence (according to the requirements of each of the 50 USA states).
Entity in charge of studio curriculum design	University, based on: NCARB Education Standard; NAAB Programme and Student Criteria.
Entity in charge of the practical training programme and the method of its execution	NCARB: 3,740 h of practice within six practice areas: <ol style="list-style-type: none"> 1. Practice management; 2. Project management;

		<ol style="list-style-type: none"> 3. Programming and analysis; 4. Project planning and design; 5. Project development and documentation; 6. Construction and evaluation. <p>Experience must be logged and approved by AXP supervisor through NCARB record.</p>
Entity	Examining body: Licensing body: Licence registry keeper: Professional association:	NCARB - scope of examination concerns all 6 practice areas; State authorities (individually in each state); State authorities (individually in each state); American Institute of Architects (membership not obligatory in order to practice the profession).

Table 6: Requirements concerning access to the profession and the entity responsible for defining the teaching process and professional licensing in the UK.

		General system solutions determining the teaching and licensing process applicable in the UK in the years 2002-2019
Condition of access to the profession		University-level education (course types as described in Table 3), i.e. part 1 and part 2; Completion of professional training (in accordance with the regulations described below); Passing a licensing examination and registration (part 3).
Entity in charge of studio curriculum design		University-level education: <ul style="list-style-type: none"> • Architects Registration Board (ARB Criteria at parts 1, 2 and 3); • Royal Institute of British Architects (RIBA) validation criteria - not obligatory for schools of architecture but compulsory for students planning AIA membership.
Entity in charge of the practical training programme and the method of its execution		Architects Registration Board (ARB): Minimum 24 months of professional practice (part 3) after completing a study (part 1 and 2) - 12 months of practice recommended after completing part 1. Alternatively <i>earn and learn</i> programme. Significant role of professional studies advisor (PSA) responsible for supervising professional practice and ways of recording it (for example, RIBA professional education and development resource (PEDR)).
Entity:	Examining body: Licensing body: Licence registry keeper: Professional association:	ARB - scope of examination concerns six following fields: <ol style="list-style-type: none"> 1. Professionalism; 2. Clients; 3. Users and delivery of services; 4. Legal framework and processes; 5. Practice and management; 6. Building procurement. ARB ARB RIBA (membership not obligatory in order to practice the profession).

The data show in the USA and the UK education systems the leading role of a selected, authorised entity with exclusive competence to co-ordinate the principles of the entire education process. Unfortunately, this also indicates the lack of such an entity in Poland.

PROBLEM AREAS

Identified by the research were problems in four areas.

Problem Area 1: Basic Principles for Organising Architecture Courses

The analysis shows that the education systems of the USA and the UK give students greater freedom in composing their course of education. These systems offer alternative, parallel means for students to achieve their goal of gaining knowledge, skills and competencies.

In the USA, both first cycle and second-cycle studies can form a basis for applying for a licence. In the case of second-cycle studies, the first cycle does not need to be linked closely to teaching matters directly associated with architecture.

In the UK, the recommended two-part teaching process, with a year-long period of professional training between parts one and two, is not a legal requirement. Noteworthy is the alternative *earn and learn* system introduced in 2018, which combines learning with professional practice in design practices, allowing talented students to lower significantly the cost of their education.

One particular element is the total number of hours required of each student in the UK and the USA curricula over five years of study. In the USA, a student's workload is measured by the number of credit hours (CH) that must be earned. For the architecture courses, this number is 150 CH (15 CH per semester). Based on the USA Code of Federal

Regulations, 1 CH requires at least 2 additional hours of a student's independent work, over the 15-week semester course. This means that, during a single semester, a student must spend at least 675 h (45 h x 15 weeks) on studying, which amounts to 6,750 h across the entire course.

In the UK, a student's workload is equivalent to earning 60 credits over a semester, which corresponds to 30 ECTS credits. During the entire course, a student should earn 600 credits/300 ECTS credits. The assumption is that 2 British credits (1 ECTS credit), is 20 hours of student work [12]. This is 5 to 10 hours less than in most European countries. Architecture students in the UK should study for no less than 6,000 h over a five-year period.

Polish regulations are not as flexible as are those in the USA and the UK, and students are forced to engage in a significantly greater amount of work. Access to the profession is offered solely through Master's studies in architecture. Students are required to earn at least 300 to 330 ECTS credits during their course (depending on the type of course, excluding practical training). Legal regulations specify the required number of hours a student needs to work to earn a single ECTS credit as 25 to 30 h. This results in a minimum workload of 7,500 to 9,900 hours. This value is comparable to the amount of work required of a full-time employee and is almost 50% greater than that required of USA or UK students.

Also it should be recalled that, although the regulations introduced in Poland in 2019 did not markedly increase the minimum number of required ECTS points, they raised the minimum number of hours of classes by 400. For a student's workload not to increase, the previously taught curriculum content would have to be reduced in terms of the allotted time. Unfortunately, this is unrealistic due to the employment structure dominating in architecture schools (mostly state-owned). Thus, the workload is set to increase either way. This solution seems not to guarantee the best educational outcomes [13] and points to an urgent need to pursue alternative solutions in Poland.

Problem Area 2: Role of Learning Outcomes in Curriculum Design

In literature, in the USA and the UK, learning outcomes are the main determinants of course curricula [14][15]. In both countries, the learning outcomes, defined as programme criteria, are the genesis of programme requirements. In the UK, learning outcomes are the sole basis for a university to design a curriculum. In the USA, these learning outcomes are complemented by subject areas and categories required in curricula. In both cases, universities are left with a greater degree of freedom, and their curricula are much more varied, which is conducive to inter-university competition [16].

A considerable portion of learning outcomes requires professional training, which is a critical element of education [17], which is why it forms an integral part of the teaching and preparation for a licensing examination. The course of practical training is supervised by an independent counsellor. In the USA, it is possible to engage in practical training during university studies, while in the UK it is either recommended or required by universities.

Polish regulations concerning the teaching system from 2019 are also based on learning outcomes. However, there is a key difference. The regulations specify in detail the classes required, along with the study hours. Only later do they specify the required outcomes. The regulations of 2011 were similar. They were less detailed and specified the required content instead of specific classes. Poland has adopted a principle of designing centralised course curricula, assuming that the mandatory classes defined by law should ensure the learning outcomes. As demonstrated in this study, the centrally defining curricula intensifies over time, limiting the freedom of architecture schools to design curricula. This constrains their ability to compete, adversely affecting the education system.

In Poland, learning outcomes, as in the USA and the UK, should be achievable through practical training. Unfortunately, the rapidly changing Polish legal system has produced incoherent legal requirements. This has been presented separately as a part of problem area 3.

Problem Area 3: Professional Practice and Licensing in the Education System

Practical training is important when teaching architecture [18], which also applies to training in legal regulations. In the USA and the UK, professional training is - with university education and the licensing examination - one of three critical elements conditioning the right to practise in the profession. In these countries, practical training should be performed (entirely or in part) under the supervision of a qualified architect.

The scope of activities required during practical training should cover a broad range of subject matter, including familiarity with the law and the precepts of the design process (from the pre-design phase to the beginning of building occupancy), the principles of office management, contacts with clients and co-operation with other designers. The course of practical training should be supervised and recorded by an authorised body independent of the architect who oversees the apprentice. Regulations in the USA also have additional requirement concerning the number of hours allotted for each type of activity during practical training.

Great emphasis is placed on the examination process of candidates applying for professional qualifications. Examinations in the USA and the UK have many stages and cover the same subject matter as required for practical

training. Also required under the process is an appropriately documented body of work performed over the training period. The examination is difficult and requires considerable knowledge and experience. In the USA, the average elapsed time required by candidates to pass the examination, as reported in 2016, was around two years [19].

Given this background in the USA and the UK, the Polish regulations are not up to the same level. On the one hand, a semester-long period of practical training was introduced into the curriculum in 2019. This practical training should take place outside a university, no earlier than after the fourth semester of study, and be supervised by a licensed architect. The regulations regarding vocational education standards also set out the basic learning outcomes to be achieved by a student. Among them is the need to know and understand the design process and the accompanying legal conditions, the role of the architect, and the principles and methods of organising the work in an architecture office. This practical training can be a part of mandatory training required to obtain a professional licence. On the other hand, regulations introduced in 2014 shortened the period of obligatory design practice, from two years to one year. The manner of documenting experience is at present limited to describing the type of building and the associated scope of work. The course of the practical training period is supervised solely by the architect who hosts it.

The manner of conducting the licensing examination is far from comprehensive. The written part of it applies solely to the candidates' knowledge of construction and legislative issues of building development. The oral part focuses on the practical application of legal provisions, the application of technical knowledge while practising the profession and the scope of the design licence. Therefore, a considerable portion of knowledge necessary for the effective, independent practising of the profession (including office management, drafting analyses, cost estimation, contact with clients, contact with designers from other specialisations) is not verified in any way.

Problem Area 4: Cohesion of the System

The problems discussed above have a strong impact on the process of preparing students and graduates for practising in the architectural profession. Problem area 4 focuses on the cohesion between the education system, practical training and issuing professional licences. It also considers the rights of relevant entities.

Highlighted in this analysis is the significance of these subjects in the USA and the UK. In both countries, the important co-ordination activities are entrusted to institutions appointed for this purpose. In the UK, the ARB was established by Parliament under the provisions of the Architects Act of 1997. In the USA, the essential competencies concerning the teaching and issuing of professional licences were given to state governments, yet these authorities jointly established the NCARB, a non-profit organisation intended to perform these tasks. The American NCARB and the British ARB possess full powers to define learning outcomes, verify school curricula, conduct accreditations, set standards for practical training and supervision, and to conduct professional examinations. These institutions, despite their professional character, are not identical to the professional associations operating in both countries. They are also not managed solely by architects.

Associations such as the American Institute of Architects (AIA) and the RIBA are not obligatory, but membership in those organisations means greater professional prestige. These associations only support the operation of leading institutions.

Against this background, Polish solutions seem less cohesive and consistent. Basic regulations are drafted at the central level through separate entities, such as Parliament, the ministry in charge of education or the ministry in charge of construction. This leads to regulations that shape elements of the education process to varying degrees.

As shown through the analysis, the regulations concerning education standards from July 2019 introduced greater requirements concerning the curricula and their allotted hours, including the additional period of practical training. On the other hand, the legal changes prepared by the Parliament in 2014 shortened the total length of the design practice required by law by one year and, in a most limited way, described the scope of activities to be carried out during this period.

These regulations are still in effect and no attempt has been made to amend them. In addition, only technical and legal issues constitute the scope of knowledge to be verified during the licensing examination.

In July 2019, new legal regulations enabled universities to implement (non-obligatory) long-cycle courses. This was the right decision because, according to Polish law, only an architecture course and a professional degree give full access to practising the profession. Simultaneously, the same regulations imposed the necessity to apply the altered curriculum to every type of university course expected to start after October 2020. As a result, the willingness of universities to introduce long-cycle courses has been strongly limited due to the exceedingly short time left for curriculum preparation and the requirement to simultaneously formulate two curricula, i.e. for previous two-cycle courses and for the new optional long-cycle courses.

A separate problem is the role of entities in the teaching system and verification of learning outcomes. Universities are obligated to design their curricula largely based on the groups of classes outlined in legislation, while the impact of the schools themselves on centrally drafted regulations is negligible. The Polish Accreditation Commission, an independent entity authorised by law to assess and accredit universities does not have any essential impact on curriculum requirements.

The Chamber of Architects is a Polish professional association. Membership for this association is obligatory for those who wish to practise the profession. Its members supervise practical training at their offices. The Chamber of Architects holds exclusive rights for examining and granting professional licences. Access to the profession is thus determined by passing the examination supervised solely by the Chamber's members. At the same time, the Chamber does not have any instruments that would allow it to define key learning outcomes and to shape the education system. The process conditioning access to the profession is centrally regulated, but the competencies of each entity are fragmented. Therefore, the co-ordination of these efforts is limited [20].

SUMMARY AND CONCLUSIONS

The research findings were that there are systemic inconsistencies in Poland. The scope of programmatic guidelines that has been expanded by legal regulations limits the freedom of architecture schools to shape their own curricula. Groups of classes required by law have become the key element of every curriculum, instead of being driven by expected learning outcomes. The new standards increased the obligatory minimum number of hours devoted to learning the architectural profession. Unfortunately, this change is not accompanied by proper care in organising practical training for university graduates. The organisation of the licensing examination is also a weakness. However, the weakest element is the lack of a single, well-defined and comprehensive vision of the entire education system.

Creating legal solutions within which responsibility for the university teaching framework, carrying out practical training and defining examination rules, should be given to a single authorised institution as the necessary reparatory measure. The managing body of this institution should include specialists from the academic community, architectural associations and members of the public administration. Its overarching goal should be to ensure the cohesion of all formulated solutions with the public good in mind - the space shaped by qualified architects.

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