Bridging the gap between generations of specialists: Russia's comprehensive approach to supporting young cadastral engineers

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Key w**ords**: cadastre, CPD, curricula, education, land management, young surveyor.

1. SUMMARY

In 2016, Russia introduced a multilevel procedure for obtaining the qualification of a cadastral engineer, including specialized higher education, a two – year internship, a qualification exam and mandatory membership in a self-regulatory organization of cadastral engineers. These requirements, designed to improve quality, led to the lower age limit of cadastral engineers – being 25 years, and, as a result, the outflow of young people.
A study by the National Chamber of cadastral engineers in 2025 among 10 thousand young specialists 25-35 years old showed that their share is only 14% of the total number of specialists. Three systemic problems were identified: an extremely low proportion of the 25 – 30 age group, a significant gender shift towards women and a high level of disciplinary violations.
Addressing these challenges is critical to achieving national land management and inventory goals and contributes to global Sustainable Development Goals (SDGs).
The report presents a detailed multi-level program designed for 2025 – 2030 and aimed at three target groups:
1. Young engineers (focus on reducing violations and ensuring a successful career start).
2. Mentors and interns (strengthening the continuity of knowledge).
3. Students (formation of a personnel reserve).
Expected results include an increase in the share of young people in the profession, a decrease in the number of violations, an increase in the prestige of the qualifications of a cadastral engineer, and a strengthening of the culture of mentoring. This program forms the foundation for a sustainable future for the industry and aligns with FIG's vision of «The Future We Want – The SDG's and Beyond». The proposed model could be useful for countries facing similar demographic challenges in geospatial occupations.

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2. INTRODUCTION

Today, the cadastral engineer is a key figure in Russia's real estate sector, providing a description of real estate objects for inclusion in the Unified State Register of Real Estate.
The institution of cadastral engineers was formed in 2007 – 2011, replacing land surveyors. Since 2014, cadastral activities can only be carried out by individuals with a qualification certificate of a cadastral engineer. This is a specialist combining technical and legal knowledge, acting as a crucial link between property owners, the state cadastral authority (Rosreestr), and the real estate market.

3. ADAPTATION: FROM LICENSING TO SELF-REGULATION

2007 – 2016: Gradual transition from land surveyors to cadastral engineers.
The main innovation was the transfer of responsibility for the quality of cadastral work from companies to individuals – cadastral engineers. To obtain a cadastral engineer certificate, a specialist with any higher education or specialized secondary vocational education was required to pass an exam. Membership **of cadastral engineers in self – regulatory organizations (SROCE)** was voluntary. **As of 2016**, there were 36,101 cadastral engineers in the country.
In order to increase responsibility for the results of cadastral work, since 2016, mandatory membership in SROCE and new requirements for the qualification of "cadastral engineer" have been introduced (Fig. 1).

Figure 1. SROCE membership requirements (since 2016)

Item No.	Requirement
1	Citizenship of the Russian Federation
2	Higher specialized education or professional retraining in the amount of 600 hours
3	Two – year internship
4	Passing a theoretical exam with a high pass mark of 90%
5	No criminal record or disqualification
6	Professional liability insurance

The 2016 reform raised the level of specialists and, as a result, the quality of cadastral work increased, which in the medium term (2016 – 2026) made it possible to solve key problems.
However, studies in 2025 have shown that there may be new problems in the future **related to**:
– **an ageing workforce:** since the basis of the professional community is engineers who received a certificate before 2016 according to a simplified procedure;
– **a shortage of young professionals:** due to the high threshold of entry into the profession.
In this regard, the National Chamber of cadastral engineers (National Chamber) and SROCEs have developed a comprehensive program to attract and support young people in the profession. This program will be discussed further.

4. LEGAL STATUS OF SELF-REGULATORY ORGANIZATION OF CADASTRAL ENGINEERS

SROCEs are created as **associations**.
An SROCE receives legal status after inclusion in the state register if the conditions are met:
1) having at least 700 members;
2) having established management bodies, specialized bodies, methodological body;
3) having approved standards for cadastral activities and the rules of professional ethics of cadastral engineers.
The key functions of SROCE are:
- development of standards establishing uniform rules for cadastral activities and professional ethics;
- exercising control over the professional activities of its members in the field of cadastral relations;
- organization of internship;
- disciplinary proceedings.
Thus, SROCE in Russia is a well-thought-out legal mechanism, created by the state to unite professionals and build uniform standards to achieve common high goals.

4.1 National Chamber of cadastral engineers: The Coordinating Center

In order to ensure uniformity of requirements for the profession throughout Russia in 2012, the National Chamber of cadastral engineers was created.
To date, of the 13 SROCEs, 8 are voluntarily merged into the National Chamber, acting as a focal point that:
1) represents SROCE interests in public authorities;
2) develops model standards for the implementation of cadastral activities and provides methodological activities in the field of self-regulation of cadastral activities;
3) organize and conduct a qualification exam;
4) forms a unified youth policy and coordinates support programs.
For a young specialist, the standards serve as a **"roadmap"** that shortens the adaptation period and minimizes mistakes at the start of a career. It is a tool for formalizing and transferring knowledge from experienced colleagues to a new generation.

In parallel with technological standards, detailed Professional Ethics Rules were developed and implemented. They establish the norms of behavior of the cadastral engineer in relations with clients, colleagues, government agencies and society, are focused on increasing confidence in the profession and preventing disciplinary offenses.
Thus, the self-regulation system, having formed clear professional guidelines, also created the infrastructure and tools for systematic work to attract, adapt and develop a new generation of cadastral engineers.

5. PROBLEMS OF YOUNG CADASTRAL ENGINEERS

5.1 High Level of Disciplinary Misconduct

A study of the National Chamber of 2025, conducted among 6 SROCEs, showed a high level of disciplinary offenses committed by young cadastral engineers.
The alleged causes of this problem are:
1. **Lack of experience:** complex cadastral cases are not covered during the internship.
2. **lack of a mentor:** after obtaining qualifications, a young cadastral engineer is often left alone with problems, without the support of a senior colleague.
3. **Economic pressure:** the desire to start earning faster can push you to accept risky orders or miss deadlines.
4. **Complexity and variability of legislation:** difficult to track without methodical support.
Thus, the created system of control and disciplinary proceedings has proven its effectiveness in improving the quality of cadastral work throughout the country. However, it has also exposed a weakness in the mechanism of adaptation of young specialists who turned out to be the least prepared for work in conditions of strict requirements and total control.

5.2 Internship and Qualification exam

Introduced in 2016, a mandatory two-year internship has become a fundamental element of the Russian system for training cadastral engineers. Its goal is to ensure not only the transfer of practical skills from an experienced mentor to an assistant, but also the formation of uniform high standards of the profession from the very beginning of a career.
Since 2016, the internship rules have been constantly optimized: the internship period has been reduced from 2,5 to 2 years, access for senior students of the university has been expanded, the number of interns for one mentor has been increased, electronic document management has been introduced, and compensation fees have been formalized.

Figure 2. Optimization of internship (since 2016)

Aspect	System formation (pre-2019)	Adjustment (2020-2023)	Current optimization (2024)	Goal and achieved progress

Duration	Duration depended on full/part-time employment (2-2.5 years).	Unification: fixed at 2 years. Clarification of recalculations.	Flexible model: "at least 2 years" with simplified recalculation.	Increased accessibility. Moving from complex calculations to a clear, flexible standard.
Access for youth	Only with a higher education diploma.	Only with a higher education diploma.	Expanded access: students admitted from the 3rd year.	Early involvement and formation of a personnel reserve.
Mentoring scale	No more than 2 interns per mentor.	Increased to 3 interns per mentor.	Increased to 5 interns per mentor.	Increased system throughput. Incentivizing experienced engineers to share knowledge.
Digitalization	Predominantly paper-based workflow.	Active development of electronic interaction.	Fully electronic workflow using digital signatures.	Reduced administrative burden, transparency, convenience for the new generation.
System sustainability	Funding for SROCEs' organizational costs was not formalized.	SROCEs independently set compensation fee calculation procedures.	Unified methodology for calculating compensation fees, ensuring transparent cost coverage.	Creating a stable financial basis for quality methodological and organizational support by all SROCEs.

After completing the internship, the candidate is allowed to pass the theoretical exam, which is conducted by the National Chamber in full-time and remote format, maintaining a high bar: 80 questions, 90 minutes, passing score – 90%.

However, the transition from a successful internship to a successful exam has become an area of increased attention. Nationwide data shows that out of 100 people who started an internship, about 20 people reached the qualification of a cadastral engineer. The main reasons for "dropout" are the need for additional support for interns and mentors.

The professional community has not been left out of these challenges. To reduce the "dropout" by the National Chamber, projects were launched:

– **"School of Cadastral Engineers":** structured preparation for the exam, showing high efficiency.

– **Strengthening methodological support:** preliminary verification of documents, consultations, access to topical issues of test tasks.

Thus, the main efforts in recent years have been aimed at: optimizing procedures; increasing opportunities for young people; ensuring the stability of the internship system; automation and flexibility of the examination process.
These improvements created the necessary infrastructure and identified the following strategic priorities: strengthening support for trainees and mentors to improve completion and developing comprehensive training to successfully pass the qualification exam. A comprehensive support program targeting three key groups has been developed to address these interconnected issues systematically.

6. COMPREHENSIVE SUPPORT PROGRAM (2025-2030)

Based on the analysis conducted by the National Chamber among 6 SROCE as of January 2025, three core problems were identified:
1. **Low proportion of young of young professionals:** they constitute only 14% of the studied cadastral engineers, with a mere 18% of this group being aged 26-30.
2. **Gender imbalance:** the proportion of men has decreased to 25% over 20 years, although the profession was previously considered "male".
3. **High level of violations:** 23% of young specialists have disciplinary measures.
Thus, a generalized profile of a typical representative of the younger generation of cadastral engineers has emerged – this is a woman aged 31-35 with a specialized higher education in the field of "Land Management and Cadastres", who received a qualification certificate before 30.06.2016, is employed by a legal entity and lives in the Moscow region.
The analysis revealed not just problems but clear target groups requiring tailored measures. Our 2025-2030 program is built around three key audiences:

Target Group 1: Young cadastral engineers
Problem: high level of disciplinary violations – 24%, difficulties in starting a career, lack of support.
Specific program measures are focused on reducing the risks of violations and ensuring successful entry into the profession:
– personalized methodological support: creation of a dedicated platform for online consultations, coupled with preliminary free verification of documents prepared by cadastral engineers;
– material support: development of sponsorship programs and benefits;
– professional socialization: holding professional skills contests with bonuses for young people, organizing youth forums, educational events.

Target Group 2: Mentors and trainees
Problem: high internship attrition rate – 43%, lack of motivated mentors.
Specific measures are focused on strengthening the institution of mentoring and internship:
– assistance in ensuring continuity and continuity of professional skills transfer;
– formalization and encouragement of mentoring: development of "Mentor Ethics Code", introduction of departmental system of awards, and a rating of the best mentors;
– financial incentives for mentors: development of sponsorship programs and benefits;

– optimization of internship: methodological support of the "School of Cadastral Engineers".

Target Group 3: Students
The problem: insufficient influx into the profession.
Specific measures are focused on the formation of a personnel reserve and the popularization of the profession:
– early career guidance: partnership with universities, college and schools; educational projects, excursions to cadastral/geodetic companies;
– identification of the most talented and professionally oriented part;
– work with the popularization of the profession: creation of media content, participation in federal projects.

6.1 Expected results

The implementation of the comprehensive program aims to achieve measurable results by 2030:
– increase in the share of young people in the profession from 14% to **30**%;
– reducing the number of disciplinary violations among young professionals by **30**%;
– development of a sustainable mentoring culture involving at least **70**% of experienced engineers;
– the growth of the prestige of the profession and the influx of applicants to specialized universities.

7. CONCLUSION

The analysis demonstrates that the Russian cadastral industry, having established a strict regulatory framework and a self-regulation system, faced a classic challenge for mature professional communities: **the threat of loss of generational continuity**. High barriers to entry into the profession have inadvertently created a demographic divide.
However, the professional community of cadastral engineers conducted in-depth diagnostics and developed a proactive comprehensive program to support three key groups: young engineers, mentors and students. This model, based on the partnership of the National Chamber, SROCE, educational institutions and the state, represents a strategic investment in the sustainable future of the profession and the entire cadastral system of Russia, ensuring the fulfillment of national tasks in the field of land management and real estate.
The program's implementation directly contributes to the achievement of the UN Sustainable Development Goals: **Quality Education (4), Decent Work and Economic Growth (8), Industry, Innovation and Infrastructure (9), and Sustainable Cities and Communities (11)**.
Russia's experience in identifying problems and formulating practical solutions can be useful to the FIG international professional community to overcome similar demographic challenges and achieve the vision of «**The Future We Want – The SDG's and Beyond**».

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