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Russian universities: analysis of structural changes, challenges and development trends

The higher education system of the Russian Federation has undergone significant changes over the past 15 years, and the President of the Russian Federation has set ambitious university development goals: by 2030, world-class scientific, educational and research centres are to be established (Instruction of the President No. Pr-589, 1a dated March 28, 2020), a network of modern campuses is to be set up and university dormitories are to be constructed, overhauled or reconstructed (Instruction of the President No. Pr-419 1g, z dated March 17, 2021).
Starting this year, an increase in the number of students at the Russian universities is projected, which is primarily related to demographic indicators.
The article analyzes changes in the structure of Russian universities and suggests development forecasts, classifies the universities depending on the organizational form and categories, founders and subordination, involvement in the ongoing projects and programmes. The development trends of the universities, both private and public, their assets are outlined. The case of the Russian University of Transport illustrates the existing challenges and trends in the development of the state university related to the university's asset complex.
Keywords: *higher education, classification of universities, university assets, depreciation*

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INTRODUCTION

As of 2021, the higher education system of the Russian Federation has encompassed 803 universities; they have 4,044 thousand students and about 165 thousand cadets of law enforcement structures.

Higher education aims to ensure the training of highly qualified personnel in all major areas of socially useful activities meeting the needs of society and the state, to fulfill the needs of a person in intellectual, cultural and moral development, to deepen and expand education, scientific and pedagogical qualifications[1].

Graduates of institutions of general secondary education are allowed to master higher education programmes. It takes 11 years to complete general secondary education in Russia. Thus, the majority of students of higher education institutions are aged from 18 to 22 years (more than 62 % of the total number of students in 2020 and 2021).

Having studied the statistical data on the 2020 population of the Russian Federation[2], as well as the data on the number of students of higher education institutions in 2005–2021[3, 4], we provide summarized information in Table 1.

Columns 1, 2 show statistical data on the population aged 0 to 37 years. Columns 3, 4 contain relevant data on the population aged 18 to 22 years in 2020, and forecasted from 2005 to 2038, with no adjustment for a possible decline and increase in population (mortality, migration). Column 5 has relevant data on the number of students of higher educational institutions in 2005–2021, and a forecast for 2022–2038, equal to the multiplication of the population aged 18–22 years (column 3) by the involvement rate obtained by dividing the number of students by the population aged 18 to 22 years, and equal to 0.6 (column 6).

Having studied Table 1, we can draw the following conclusions:

- for the period from 2005 to 2021, there was a decrease in the population aged 18 to 22 years by 45 % (from 12,611.5 to 6,899.0 thousand people), which affected a 42 % decrease in the number of students of higher educational institutions (from 7,064.6 to 4,044.2 thousand);
- not more than 60 % of school graduates, aged 18 to 22 years, enter higher education institutions;
- as of 2022, a gradual increase in the population aged 18 to 22 years and students entering higher education institutions is projected; by 2034, the population aged 18 to 22 years will reach about 9,577.4 thousand people, which, in turn, will lead to an increase in the number of students by 42 % compared to 2021 (from 4,044.2 to 5,746 thousand people).

The forecast does not take into account migration-related changes, including an increase in the number of students studying at Russian universities within the framework of an admission quota for foreign students. Since March 2022,

1 On Education in the Russian Federation : Federal law of December 29, 2012 No. 273.

2 Statistical bulletin “Population of the Russian Federation as of January 1st, 2021, by gender and age group”. Federal State Statistics Service (ROSSTAT). Moscow, 2021. URL: https://rosstat.gov.ru/compendium/document/13284

3 Form No. VPO-1 “Data on the institutions, performing educational activities for educational programs of the higher education — programs of a bachelor degree, specialist program, Master’s programs”.

4 No. VPO-2 “Data on material, technical and information base, financial and economic activity of the educational organization of the higher education”, the Ministry of Science and Higher Education of the Russian Federation. Statistical data. The higher education. URL: https://minobrnauki.gov.ru/action/stat/highed/?ysclid=l0v60b4apy

Table 1. Various age group in 2020 with the actual and expected data on the number of students[5]

2020		Population (aged 18–22), persons	Years	Number of students, persons	Involvement rate (ratio of student number/population (18–22 years))	
Age (years)	Population, persons					
1	2	3	4	5	6	
1	1,537,954	—	2039	—	—	Expected data
2	1,642,782	—	2038	—	—	
3	1,784,718	8,812,050	2037	5,287,230	0.60	
4	1,909,745	9,203,557	2036	5,522,134	0.60	
5	1,936,851	9,485,642	2035	5,691,385	0.60	
6	1,929,461	9,577,409	2034	5,746,445	0.60	
7	1,924,867	9,430,460	2033	5,658,276	0.60	
8	1,876,485	9,205,039	2032	5,523,023	0.60	
9	1,762,796	8,993,291	2031	5,395,975	0.60	
10	1,711,430	8,736,103	2030	5,241,662	0.60	
11	1,717,713	8,418,165	2029	5,050,899	0.60	
12	1,667,679	8,152,510	2028	4,891,506	0.60	
13	1,558,547	7,943,528	2027	4,766,117	0.60	
14	1,497,141	7,723,483	2026	4,634,090	0.60	
15	1,502,448	7,520,241	2025	4,512,145	0.60	
16	1,497,668	7,349,306	2024	4,409,584	0.60	
17	1,464,437	7,216,664	2023	4,329,998	0.60	
18	1,387,612	7,060,246	2022	4,236,148	0.60	
19	1,364,499	6,899,095	2021	4,044,203	0.59	Actual data
20	1,346,030	6,778,350	2020	4,049,333	0.60	
21	1,336,517	6,752,231	2019	4,068,327	0.60	
22	1,343,692	6,832,414	2018	4,161,672	0.61	
23	1,361,493	7,026,363	2017	4,245,885	0.60	
24	1,444,682	7,277,966	2016	4,399,487	0.60	
25	1,539,979	7,658,399	2015	4,766,479	0.62	
26	1,588,120	8,247,085	2014	5,243,455	0.64	
27	1,724,125	9,004,758	2013	5,691,157	0.63	
28	1,950,179	9,836,361	2012	6,073,900	0.62	
29	2,202,355	10,691,764	2011	6,490,000	0.61	
30	2,371,582	11,518,747	2010	7,049,800	0.61	
31	2,443,523	12,164,844	2009	7,418,800	0.61	
32	2,551,108	12,528,302	2008	7,513,100	0.60	
33	2,596,276	12,668,125	2007	7,461,300	0.59	
34	2,565,813	12,722,681	2006	7,309,800	0.57	
35	2,511,405	12,611,774	2005	7,064,600	0.56	
36	2,498,079	12,318,497	2004	—	—	
37	2,440,201	12,067,020	2003	—	—	

5 Data are provided in the form No. VPO-1 “Data on institutions, performing educational activities through educational programs of higher education: bachelor’s degree programmes, specialist program, master’s programmes”, the data is available on the official site of the Ministry of Science and Higher Education of the Russian Federation. Data are also provided on various age groups and extracted from the statistical bulletin “Population of the Russian Federation by Gender and Age as of January 1, 2021” on the official Rosstat website.

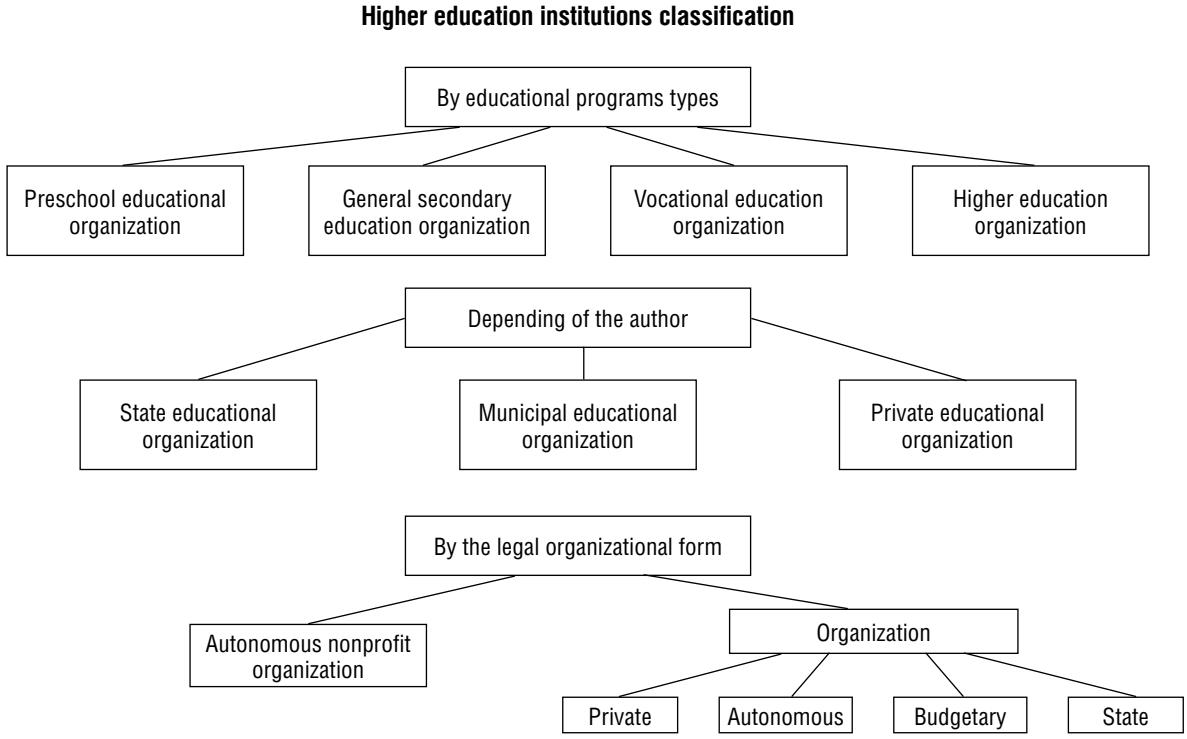

Fig. 1. Classification of the educational institutions

Russian students arriving from abroad, as well as foreign students arriving from the Donetsk People's Republic, Lugansk People's Republic and Ukraine, can continue their studies at the universities of the Russian Federation free of charge within the framework of the foreign student quota[6].

CLASSIFICATION OF UNIVERSITIES

An educational institution is a non-profit organization that carries out educational activities on the basis of a license as the main type of activity[1].

Here is a classification of educational institutions (Fig. 1).

Educational institutions are divided into types according to the educational programmes, the implementation of which is the main purpose of their activities. The following types of educational institutions implementing basic educational programmes are available in the Russian Federation:

1) preschool educational institution is an educational institution that conducts educational activities through educational programmes of preschool education, supervision and care of children as the main purpose of its activity;

2) a general education institution is an educational institution that conducts, as the main purpose of its activities, educational activities through educational programmes of primary general, basic general and (or) secondary general education;

3) a vocational education institution is an educational institution that conducts educational activities through educational programmes of secondary vocational education and (or) vocational training programs as the main purpose of its activity;

4) an educational institution of higher education is an educational institution that conducts educational activities through educational programmes of higher education and research activities as the main purpose of its activity[1].

An educational institution is established in the form set by the civil law for non-profit organizations:

- institutions, which have state institutions, municipal institutions and private (including public) institutions;
- autonomous non-profit organizations.

A non-profit organization is an organization that does not have profit-making as the main goal of its activities and does not distribute its profits among the members[5].

A private educational institution is an educational institution established in accordance with the legislation of the Russian Federation by an individual or individuals and (or) a legal entity, legal entities or their associations, with the exception of foreign religious organizations[1].

A unitary non-profit organization that does not have membership and is established on the basis of property rights of residents and (or) legal entities for the purpose of providing services in the fields of education, health, culture, science and other areas of non-profit activity[7] [6, Article 123.24] is an autonomous non-profit organization.

An institution is a unitary non-profit organization established by the owner to perform managerial, socio-cultural or other non-commercial functions[6].

6 Website of the Ministry Science and Higher Education of the Russian Federation. URL: https://minobrnauki.gov.ru/press-center/news/?ELEMENT_ID=48557&lang=ru&ysclid=l0weai6mbd

7 Civil Code of the Russian Federation.

A private institution is a non-profit organization established by the owner (a citizen or a legal entity) to perform managerial, socio-cultural or other non-commercial functions[8].

An autonomous institution is a non-profit organization established by the Russian Federation, a subject of the Russian Federation or a municipal entity to perform work, provide services for the purpose of exercising the powers of state authorities provided for by the legislation of the Russian Federation, the powers of public authorities in a federal territory, the powers of local self-government bodies in the fields of science, education, health, culture, mass media, social security, employment, physical culture and sports, and also in other areas in cases established by federal laws (including when carrying out activities to work with children and youth in these areas)[9].

A state public institution is a state (municipal) institution that provides state (municipal) services, operates and (or) performs state (municipal) functions to ensure the implementation of the powers of state authorities (state bodies) or local self-government bodies provided for by the legislation of the Russian Federation, the financial support of whose activities is carried out at the expense of the relevant budget based on the budget estimates[7].

A budgetary institution is a non-profit organization established by the Russian Federation, a subject of the Russian Federation or a municipal entity to perform works, provide services to ensure the exercise of the powers provided for by the legislation of the Russian Federation, respectively, of the state authorities (state bodies), public authorities of the federal territory or local self-government bodies in the field of science, education, health, culture, social security, employment of the population, physical culture and sports, as well as in other areas[7].

The analysis of the distribution of higher education institutions by subordination is given in the summary Table 2.

It should be noted that 221 out of 587 state universities are in the jurisdiction of the Ministry of Science and Higher Education of the Russian Federation which makes only 37 % of their total number.

The breakdown of the number of universities by categories and projects is summarized in the Table 3.

The Lomonosov Moscow State University, St. Petersburg State University are the leading classical universities of the Russian Federation. The legal statuses of the Lomonosov Moscow State University and St. Petersburg State University are defined by the Federal law of November 10, 2009 No. 259-FZ “About the Lomonosov Moscow State University and the St. Petersburg State University”.

The Government of the Russian Federation may assign categories of “the federal university” and “the national research university” to higher education institutions. When assigning the category of the “federal university” or “national research university” to an educational institution of higher education, an indication of the assigned category is included in the name of this institution.

To ensure personnel training towards the integrated socio-economic development of the subjects of the Russian Federation, the Government of the Russian Federation may establish an educational institution of higher education in the form of an autonomous institution belonging to the category of a “federal university”. When establishing a federal university, the Government of the Russian Federation takes into account suggestions of the legislative and executive authorities of the subjects of the Russian Federation

Table 2. Distribution of higher education institutions by subordination as of December 31, 2021

Total	803
State organizations	587
In the jurisdiction of federal executive bodies — total	457
Supreme Court of the Russian Federation	1
Ministry of Health of the Russian Federation	47
Ministry of Foreign Affairs of the Russian Federation	2
Ministry of Culture of the Russian Federation (Russian Academy of Arts)	47
Ministry of Science and Higher education of the Russian Federation	221
Ministry of Education of the Russian Federation	33
Ministry of Agriculture of the Russian Federation	54
Ministry of Sport of the Russian Federation	14
Ministry of Transport of the Russian Federation	1
Ministry of Economic Development of the Russian Federation	1
Ministry of Justice of the Russian Federation	1
Government of the Russian Federation	8
Federal Service for Intellectual Property	1
Federal Customs Service	1
Federal Agency for Air Transport	3
Federal Agency for Railway Transport	8
Federal Agency for Sea and Inland Water Transport	5
Federal Agency for Fishery	5
Federal Communications Agency	4
In the jurisdiction of law enforcement ministries and departments — total	86
Ministry of Defence of the Russian Federation	27
Ministry of the Interior of the Russian Federation	20
Ministry of Civil Defense, Emergencies and Disaster Relief of the Russian Federation	6
Federal Penitentiary Service	8
National Guard Troops Federal Service of the Russian Federation	4
Federal Security Service of the Russian Federation	13
Federal Guard Service of the Russian Federation	1
System of the Prosecutor’s Office of the Russian Federation	5
Investigative Committee of the Russian Federation	2
In the jurisdiction of territorial subjects of the Russian Federation and municipalities — total	44
Private organizations	216

Data are provided in the form No. VPO-1 “Data on institutions, conducting educational activities through educational programmes of higher education, including bachelor, specialist and master’s programs from among the programmes listed on the official site of the Ministry of science and higher education of the Russian as of January 1, 2021”. Information on law enforcement agencies is available on the websites of departments and universities.

8 About non-profit organizations : Federal law No. 7 dated January 12, 1996.

9 About autonomous organizations : Federal law No. 174 dated November 3, 2006.

Table 3. Data on the number of universities broken down by categories and projects as of December 31, 2021

Category	The university with a special status	Federal university (2006–2014)	National research university (2008–2011)
	2	10	29
Project	Flagship universities (2016–2017)	Global universities Project 5–00 (2013–2020)	Global universities Priority 2030 (2021–2030)
	33	21	46 (plan–100)

prepared on the basis of programmes for the socio-economic development of the subjects of the Russian Federation.

The category "national research university" is assigned to an educational institution of higher education based on the results of a competitive selection of programmes for the development of higher education institutions aimed at the development of educational and research activities, modernization and improvement of the material and technical base and socio-cultural infrastructure of an educational institution, development of academic mobility of its students, researchers and lecturers, taking into account the contribution of the educational institution into the research and engineering development priorities of the Russian Federation, as well as for the staffing of priority development areas of research, technology, machinery, economics, social security, towards the development and implementation of high technologies[1].

The "Flagship University" project is to establish a regional university through the merger of existing higher educational institutions, towards the development of the subject of the Russian Federation that obtains highly qualified specialists for its local labour market. These specialists will be able to solve relevant problems of the regional economy and implement educational and innovative projects together with the region and its enterprises. Flagship universities are determined by the results of a competitive selection conducted by the expert council of the Ministry of Science and Higher Education of the Russian Federation.

The purpose of the 5–100 project was to maximize the competitive position of a group of leading Russian universities in the global market of educational services and research programmes[10]. The project was implemented within the framework of the Decree of the President of the Russian Federation dated May 7, 2010 No. 599 "On Measures to Implement State Policy in Education and Science", Decree of the Government of the Russian Federation dated October 29, 2012 No. 2006-r "On approving the action plan on the development of leading universities to increase their competitiveness among the world's leading centres for research and education", and Decree of the Government of the Russian Federation dated March 16, 2013 No. 211 "On measures of state support of the leading universities of the Russian Federation to increase their competitiveness among the world's leading scientific and educational centers". The selection of universities was carried out by the Council for Competitiveness Improvement of the Leading Universities of the Russian Federation from among the world's leading scientific and educational centres, whose members were approved by the orders of the Government of the Russian Federation.

The successor of the 5–100 project is the Priority 2030 programme, the purpose of which is to make a large group of universities that will become leaders in generating new research knowledge, technologies and developments to be contributed to the Russian economy and social sector[11]. The programme is implemented pursuant to Decree No. 729 of the Government of the Russian Federation dated May 13, 2021 "On measures to implement the programme of strategic academic leadership Priority–2030".

Certain benefits obtained by a flagship or global university in terms of opportunities associated primarily with additional financing of the activities of such universities from the budget system of the Russian Federation depends on the organizational and legal form and the university category, the founder and subordination of the university to certain state authorities, on the participation of the university in the ongoing projects.

PROBLEMS IN THE OPERATION OF UNIVERSITIES AND DEVELOPMENT OF THE UNIVERSITY ASSET COMPLEX

The state of the university property is of great importance for the university, since it influences the choice of applicants, students, teachers and researchers.

An analysis of the number of universities, their students, and areas of university campuses for the period from 2013 to 2021 is summarized in the Table 4.

Table 4 has proven the following trends the period of 2013–2021:

- a 29 % decrease in the number of students (from 5,691 to 4,044 thousand people), while the student number decrease rate at public universities was 22 % (from 4,755 to 3,699 thousand people), at private universities — 62 % (from 936 to 354 thousand people);
- 26 % reduction in the total number of universities (from 969 to 717) and the downsize of university branch networks by 64 % (from 1,482 to 528), while the reduction rate of public universities was 13 % (from 578 to 501 pcs.), private universities — 45 % (from 391 to 216);
- the total area of university buildings decreased by only 3 % (from 65.2 to 63.2 million m^2), while public universities by 2 % (from 61.9 to 60.8 million m^2), private universities by 29 % (from 3.2 to 2.3 million m^2).

10 Official website of Project 5–100. URL: https://www.5top100.ru

11 Official website of the Priority–2030 Program. URL: https://priority2030.ru

Table 4. Data on the number of universities, students, and the university campuses area, 2013–2021[12, 13]

Years	Number of universities, units				Number of students, thousand persons					Campus area, thousand sq.m				
	Total	Branches	State	Private	Total	State	Share, %	Pivate	Share, %	Total	State	Share, %	Private	Share, %
2013	969	1,482	578	391	5,691	4,755	83.6	936	16.4	N/d	N/d	N/d	N/d	N/d
2014	950	N/d	548	402	5,243	4,402	84.0	841	16.0	N/d	N/d	N/d	N/d	N/d
2015	896	1,079	530	366	4,766	4,061	85.2	705	14.8	65,206	61,911	94.9	3,295	5.1
2016	818	840	502	316	4,399	3,874	88.1	526	11.9	63,738	61,059	95.8	2,680	4.2
2017	766	651	500	266	4,246	3,823	90.0	423	10.0	62,887	60,483	96.2	2,404	3.8
2018	741	596	496	245	4,162	3,783	90.9	379	9.1	63,198	60,926	96.4	2,273	3.6
2019	724	563	495	229	4,068	3,736	91.8	332	8.2	63,452	61,112	96.3	2,340	3.7
2020	710	549	497	213	4,049	3,715	91.7	334	8.3	63,200	60,867	96.3	2,333	3.7
2021	717	528	501	216	4,044	3,690	91.2	354	8.8	N/d	N/d	N/d	N/d	N/d
Growth rate	**26 %**	**64 %**	**13 %**	**45 %**	**29 %**	**22 %**	–	**62 %**	–	**3 %**	**2 %**	–	**29 %**	–

A decline in the population aged 18 to 22 years led to a decrease in the number of students (part 1 of this article), which in turn affected the reduction in the number of universities due to the liquidation of private universities and consolidation of public universities. At the same time, by 2021, the share of state university students had reached 91 % (in 2013 — 83 %), the share of the area of university campuses of state universities reached 96 % (in 2013 — 93 %).

Data on the number of state universities in the context of organizational and legal forms is summarized in the given Table 5.

Analysis of data on the number of state universities in the context of organizational and legal forms allows us to draw the following conclusion: in 2013 to 2021, there was a decrease in the number of state universities due to the mergers and transformations of budgetary institutions (from 514 to 440 units) and state-owned institutions (from 21 to 1 unit), while the number of autonomous institutions has increased from 43 to 57 units, also due to transformation of the organizational and legal form of budgetary and state-owned institutions.

Having studied the data on the use and technical condition of university real estate for the period from 2013 to 2020, we arrange this information in the summary Table 6–8.

Table 5. Data on the number of state universities in the context of organizational and legal forms

Years	Total*	Autonomous organizations	Budgetary organizations	State organizations
2013	578	43	514	21
2014	548	N/d	N/d	N/d
2015	530	52	476	2
2016	502	52	449	1
2017	500	52	446	1
2018	496	50	443	1
2019	495	51	441	1
2020	497	54	441	1
2021	501	57	440	1

* 86 universities of law enforcement departments that have an organizational and legal form state and budgetary institutions are not taken into account

Table 6. Data on use of real estate (for 2020)

Name		Total	Education and laboratory buildings			Dormitories	Other
			Total	Indoor sports facilities	Public catering		
Total	area	63,200,106	41,844,402	2,432,626	1,147,536	15,629,950	5,725,754
	share	100 %	66 %	4 %	2 %	25 %	9 %
Private institutions	area	2,332,789	1,986,363	138,957	62,448	176,392	170,034
	share	100 %	85 %	6 %	3 %	8 %	7 %

12 Form No. VPO-2 “Data on material and information base, financial and economic activity of the educational institution of the higher education” from the official site of the Ministry of Science and Higher Education of the Russian Federation (data on law enforcement departments is not considered).

13 Data are provided by the form No. VPO-1 “Data on the institutions, performing educational activities for educational programs of the higher education – programs of a bachelor degree, specialist program, Master’s programs”.

Table 7. Data on the technical status of real estate, and rented property and the property offered for rent (for 2020)

Name		Total	Rented out	Under repair	In need of repair	Dangerous structures	Rented
Total	area	63,200,106	603,405	1,365,378	12,465,918	563,475	1,528,378
	share	100 %	1 %	2 %	20 %	1 %	2.5 %
Private institution	area	2,332,789	39,954	7,956	800	0	910,463
	share	100 %	1.7 %	0.3 %	0.03 %	0 %	39 %

Table 8. Data on the number of buildings commissioned and in which major repairs were carried out in the period 2001–2020 (for 2020)

Types of the higher education institutions	Total facilities	Commissioned in 2001–2020	Major repairs in 2001–2020	Total of commissioned and with major repairs in 2021–2020	Share
Total	11,334	1,446	4,870	6,316	55 %
State-owned	10,704	1,286	4,556	5,842	54 %
Private	630	160	302	462	73 %

Having analyzed the data for the period from 2013 to 2020, systematized in Table 6–8, the following conclusions can be drawn:

- the asset complexes distribution rates by purpose were approximately at the same level each year, while a significant difference in the provision of dormitories for universities was revealed (the share of dormitories area to the total area of campuses: in general, 25 % for universities, 8 % for private universities);
- the asset complex distribution rates by the technical status were approximately at the same level in each year, with the exception of the university property in need of repair, which increased from 13 % (in 2013) to 20 % (in 2020) largely due to the deterioration of the technical status of the state university asset complexes, in particular, dormitories (in 2020 more than 31 % of the total area of dormitories were subject to major repairs);
- a significant share of the property is rented by private universities — about 39 %, while state universities rent no more than 2.5 %;
- the property complex of private universities is in a better technical condition than the property complex of public universities: private universities have no property in the emergency condition, less than 1 % is under repair and subject to repair; public universities have more than 23 % of similar property; 73 % of private university buildings are in a state of effective operation (the duration of effective operation before major repairs — 20 years according to industry construction standards VSN 58-88 (p)), state universities have only 54 %.

Thus, the following pattern has been established: the share of students studying at state universities increases annually, while the infrastructure status of state universities deteriorates and the "usable" areas that can be involved in the educational process decrease. The projected growth in the number of students in the coming years will require the infrastructure development by state universities.

ANALYSIS OF THE PRINCIPAL TYPE OF ACTIVITY AND THE ASSETS OF THE RUSSIAN UNIVERSITY OF TRANSPORT

Having studied the case of the Russian University of Transport, we will analyze the university assets.

The Russian University of Transport (MIIT) is a leading national transport university, the largest Russian industrial university, a base talent pool for staffing and research support of the transport industry and its development.

The University was founded on June 4 (May 23, old style), 1896, the day when Emperor Nicholas II approved the decision of the State Council to establish the Moscow Engineering School of the Ministry of Railways. In the period from 1998 to 2007, the University repeatedly underwent the procedure of reorganization by joining various educational institutions of the Ministry of Transport of the Russian Federation (later the Federal Agency for Railway Transport).

In 2015, the university was renamed as "The Emperor Nicholas II Moscow State University of Railways" Federal state budgetary educational institution of higher education.

In 2016, the university was transferred to the Ministry of Transport of the Russian Federation, and in 2017 it was renamed as the Federal state budgetary educational institution of higher education "Russian University of Transport". In 2019, the status of the institution was changed from state-funded to autonomous.

The University has one of the largest campuses in Moscow. On the balance sheet of the university there are 108 buildings with a total area of 357.8 thousand m^2. More than 30 thousand students study at the university (as of 1.01.2022).

The results of the inventory of the technical status of the university assets, conducted in 2020, within the framework of which the amount of physical wear was determined in relation to each university building, proved the average amount of physical depreciation of the assets as 42 % (D_{pp}); it was calculated using the formula:

$$D_{pp} = \frac{\sum_{i=1}^{m} D_b \cdot S_b}{S_{pp}},$$

where D_{pp} is the average rate of physical depreciation of assets, %; m is the number of buildings included in a pool of buildings used to determine the physical deterioration of the university assets; D_b is the physical depreciation of a building, %; S_b is the total area of a building, m^2; S_{pp} is the total area of the assets equal to the total area of the buildings, m^2.

Various formulations and methods are used to identify the depreciation of real estate facilities. The degree of loss of initial resistibility is taken as a measure of physical depreciation in quantitative analysis. At the same time, the service life of any building (service life) is always shorter than the period of complete exhaustion of resistibility by the bearing construction (service life limit), the building is never operated until the moment of destruction. In addition to the assessment of physical depreciation, it is important to estimate functional (moral) obsolescence, which is associated with factors of consumer behaviour and demand that have a subjective nature (the degree of compliance of the facility with modern functional requirements, consumer standards, consumer (customer) preferences). External (economic) depreciation is a decrease in the cost of a building due to the negative impact on the facility of changes in its external environment caused by environmental, economic, political, social, urban planning or other external factors [1].

Taking into account the above, the technical status of the university assets, identified using the indicator of "normative physical depreciation" (according to accounting data, amortization is such an indicator) can be pictured in the form of a linear graph (Fig. 2).

The Russian university of transport was not previously included in any of the abovementioned categories, projects, programmes, and it was under the jurisdiction of the Federal Agency for Railway Transport. In this regard, the last targeted infrastructure upgrade was carried out in 1997 at the expense of the budget system of the Russian Federation. A significant portion of the university assets needed modernization in 2020, and after the transfer of the university into the jurisdiction of the Ministry of Transport of the Russian Federation, significant changes took place due to the retargeting of the university.

In accordance with the Orders of the Government of the Russian Federation dated February 2, 2020 No. 230-r, dated March 20, 2021 No. 691-r, a subsidy from the federal budget was provided to the Russian university of transport in 2020 and in 2021 to upgrade the infrastructure of the university, including major repairs and anti-terrorist security of facilities.

In compliance with the Order of the President of the Russian Federation dated March 23, 2018 No. Pr-518 p. 1d on the establishment of multifunctional engineering cluster "Obraztsovo" at the University, in 2020 the Russian university of transport obtained a subsidy from the federal budget for capital investments in the design, construction and reconstruction of seven capital construction facilities with a total area of 245.4 thousand m^2.

In 2021, the Russian university of transport entered the list of universities-winners of the Priority 2030 programme, and it received federal grants for the track titled "Territorial and (or) Industry Leadership".

By the end of 2021 (the year of the 125th anniversary of the Russian university of transport), the financial support obtained from the federal budget made it possible to upgrade part of the assets of the Russian university of transport (22.3 thousand m^2 or 7 % of the total fund), and reduce the average depreciation of the assets from 42 to 40 %.

The implementation of multifunctional engineering cluster "Obraztsovo" project will upgrade 123.9 thousand square meters of its area (34 % of the total area) and allow constructing new buildings with an area of 121.5 thousand m^2, which in turn, in accordance with the schedule, will reduce the average asset complex depreciation rate from 40 to 21 % and "extend" the average service life of the assets until 2066.

Thus, for infrastructure development of the state universities, whose property complex is predominated by buildings of the late 19th–early 20th century, additional state support is crucial. Specific mechanisms and modern management methods applicable by budgetary institutions are to increase the efficiency of their activities.

ASSET MANAGEMENT AT STATE UNIVERSITIES

Due to the failure to perform repair and construction works, the life cycle of buildings is reduced and the period of existence is shortened. Due to no timely repair works the operation of buildings leads to excessive consumption of energy resources, hence, an increase in the cost of housing and utility services and an increase in the cost of emergency recovery work [2].

The term "Real estate management" implies setting goals and objectives, planning, prioritization, arrangement and implementation control, reporting, implementation assessment and real estate infrastructure efficiency analysis to support the organization activities, based on the users' needs in the infrastructure and the requirements of the organization mission and strategic goals [3].

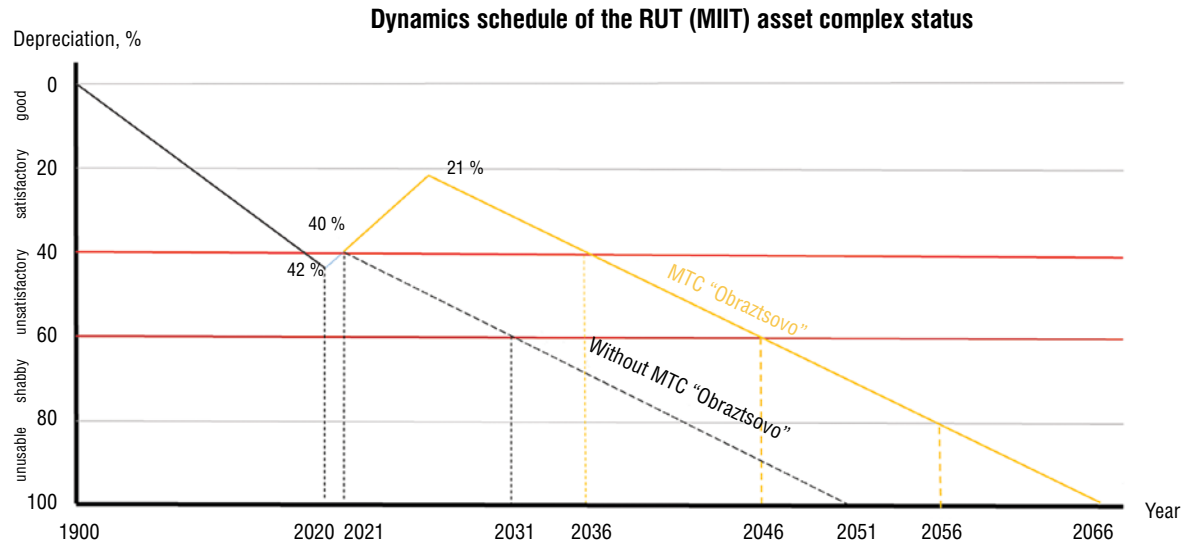

Fig. 2. Dynamics schedule of the technical status of transport assets of the Russian university

Professional real estate management can extend the life cycle of a real estate facility and increase its value by reducing the actual physical and functional depreciation, as well as reducing damage from external depreciation. At the same time, the main goal of professional real estate facility management according to the Property Management model is to achieve maximum income for the owner and increase the cost of the building while creating comfortable conditions for users, tenants or customers of this facility. This activity is carried out by specialized management companies — surveying companies [4].

As for the assets of state universities, there are a number of restrictions established by the legislation of the Russian Federation, as well as related to the fact that state universities can dispose of their property only upon an agreement of the state body acting on behalf of the owner of the property — the Russian Federation, a subject of the Russian Federation, a municipality.

Thus, effective management mechanisms used in the Property Management model cannot be used by state universities in full.

CONCLUSION

The structure of universities has undergone significant changes over the past 15 years:

- there has been a reduction in the number of universities due to the termination of activities by private universities and consolidation of the state ones, a decrease in the student-age population and the state policy pursued;
- today, less than 9 % of all students study at private universities; the area of the assets of private universities is 4 % of the total area, while about 39 % of the property is rented;
- in general, private assets have obtained a normal technical status: less than 1 % of the property needs repair;
- the share of the property held by the state universities subject to repair is annually increasing and today it reaches 23 %; dormitories are in the worst condition, more than 31 % are subject to major repairs.

Starting this year, Russian universities expect an increase in the number of students due to the demographic indicators and an increase in the number of students studying within the framework of the quota for foreign students, which in turn will require effective measures to upgrade the state universities infrastructure to a proper status, especially dormitories. Thanks to the implementation of tasks set by the President of the Russian Federation about the establishment of world-class research, educational and scientific centers, a network of modern campuses is set up and the measures are focused on construction, major repairs and reconstruction of university dormitories to upgrade the infrastructure of universities that will enter the related programmes.

The country's economic development is inextricably linked to the training of personnel in all sectors of the Russian economy; therefore, a systematic upgrade of the university infrastructure alongside with the development and implementation of mechanisms of effective management of its assets is required.

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Анализ изменений в структуре университетского корпуса страны. Проблемы и тенденции развития

Система высшего образования Российской Федерации за последние 15 лет претерпела значительные изменения, при этом Президентом Российской Федерации поставлены амбициозные задачи в развитии университетского корпуса до 2030 года, в том числе по созданию научно-образовательных и научных центров мирового уровня (поручение от 28.03.2020 № Пр-589 п. 1 а), созданию сети современных кампусов и реализации мероприятий по строительству, капитальному ремонту и реконструкции университетских общежитий (поручение от 17.03.2021 № Пр-419 п. 1 г, з).

С текущего года прогнозируется увеличение численности студентов российских вузов, которое в первую очередь связано с демографическими показателями.

В статье проведен анализ изменений в структуре университетского корпуса страны и представлены прогнозы в перспективах развития, классифицирован университетский корпус в зависимости от организационно-правовой формы и категорий университетов, от учредителей и подчиненности университетов, от включения университетов в перечень реализуемых проектов и программ. Описаны тенденции в развитии имущественного комплекса университетов как частных, так и государственных, приведены основные различия. На примере Российского университета транспорта рассмотрены существующие проблемы и тенденции развития государственного университета, связанные с имущественным комплексом университета.

Ключевые слова: *высшее образование, классификация университетов, имущественный комплекс вузов, износ*

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