National Research University Higher School of Economics

Global competitiveness program

Strategic academic unit

URBAN AND TRANSPORTATION POLICY: GUIDING URBAN TRANSFORMATION FROM INDUSTRIAL TO DIGITAL AGE

Description

Moscow, 2016

CONTENTS

1. STRATEGIC ACADEMIC UNIT "URBAN AND TRANSPORTATION POLICY: GUIDING URBAN TRANSFORMATION FROM INDUSTRIAL TO DIGITAL AGE"

1.1 Project summary

Goal:

To create an internationally recognized hub of urban research and education focused on global market, including Russia and CIS. STRA-U becomes one of the global centers for experimental research-based urbanism that re-formulates urban planning and governance for the digital age and helps urban governments across Russia and other countries to ensure smooth transformation of their urban planning and governance institutions.

Main objectives:

– Develop globally recognized unique research and educational center for Experimental Urbanism, promoting new type of research-based urban planning profession that makes economists, architects, developers and urban planners speak to each other in common professional language, no matter who they work for.

– Develop an international center for Advocacy Planning to design institutions for conflict resolutions caused by urban planning initiatives and various development and transportation projects. Promote concept of adaptable city through state-of-the-art institutional design of flexible governance and lean planning to find a proper link between urban "hard" (built environment) and "soft" (urban society) in the current dynamic of urban landscape.

– Become a member of international network of centers for experimental urbanism through international master programs "City and Technologies" and "Urban Transportation Policy," International Laboratory for Experimental Urban Design, and professional journal "Urban Studies and Practices."

– Launch international Master's programs "City and technologies" and "Advanced Urban Design" to promote new research approach in urban and transport planning, design and management. These programs will also facilitate research in supporting urban planning, adaptive city and technology-based city environment.

– Launch a new international Master's program in urban studies, city and transport planning in cooperation with the Moscow Institute of Architecture, Moscow School of Architecture and other field-specific international universities in order to set new professional standards for master's programs in urban planning and urban studies.

Main Anticipated Deliverables

– STRA-U becomes an internationally recognized hub for urban education, research and prototyping. Russia/Northern Eurasia urban experience (in architecture, urban planning, etc.), transformation and planning technology will become known worldwide through research and activities, and will be used as benchmark for developing and emerging economies.

– STRA-U launches an international journal "Urban Studies and Practices" that becomes an international urban research communication point on experimental urbanism.

– STRA-U will develop a master program on "Citiy and Technologies" (foreign students > 60%) aimed to be one of the leading educational enterprises for urban transformation policies in the digital age. Internationally recognized diploma will be conferred in cooperation with IaaC (Institute for advanced architecture of Catalonia, www.iaac.com), and potentially with other European Universities.

– STRA-U will be a hub in the global network of experimental urbanism such as MIT Media Lab (Cambridge, USA), ETH (Zurich, Switzerland), IaaC (Barcelona, Spain), City

Catapult (London, UK), Institute for Urban Design (Schenschen, China), CUSP (NYU, New York, USA) and the others.

– Through its Laboratory of Advocacy Planning STRA-U will become a center for Advocacy and Lean Planning expertise and will train transformational urban planners for the Russian and international urban governance professional markets (up to 100 per annum).

– STRA-U will serve as an advisory centre in urban development and transport policy for federal, regional and municipal authorities in Russia.

– HSE international academic reputation will be confirmed by entering the Top 100 in QS World University Rankings for "Social Sciences & Management" and the Top 100 in QS World University Rankings for "Development Studies."

Brief description of the STRA-U role and contribution into the University development and achievement of goals and target performance indicators of the Global Competitiveness Program.

Vysokovsky Graduate School of Urbanism (GSU) is an independent learning and research division of the Higher School of Economics. Founded in 2011, the School takes a multidisciplinary approach towards studying and planning modern cities, using the excellent foundation that HSE has laid in the humanities and socioeconomics. The School's mission is to create an educational and professional center in one of the most remarkable cities of the world for learning, researching and experimenting with new urban habitat through urban studies and planning practices. It is envisioned that this center will respond to the needs of the 21st century city and the corresponding era of megacities that are home to tens of millions of people with diverse interests and aspirations. These are the cities where sources of information are constantly growing and the space for civil, creative, and economic opportunities is expanding. In particular, the School is aimed at describing the experience and context of Russia-specific urban space being in transition, making role-model concepts and delivering them to the world-wide community of urban planners and scientists.

STRA-U also includes the Institute of Transport Economics and Transport Policy Studies (ITE&TPS), a research center, which was founded in 2011 to provide research, expert analysis and consultancy for government and non-government organizations and other entities. The Institute has drawn up recommendations for improvement of transport policy in connection with the review of the transport strategy to 2030. The Institute made an assessment of the current state of the Russian transport system, looking at the overall structure and types of transport; identified key divergences in the transport policy for the near future; formulated proposals for transport policy aimed at improving the way all types of transport function in line with modernization of the country's transport system; presented an evaluation of the consequences of various development scenarios; devised particular provisions for the Strategy of social and economic development of the city of Moscow up to 2025.

STRA-U activities:

– will facilitate the development of a cross-disciplinary field that is crucial for HSE and is in demand in Russia and internationally (in education and research);

– will help HSE to strengthen its position as the center of expert analysis that contributes to state policy-making in various fields of economics;

– will support HSE social mission as the university open to the city.

In 2015, STRA-U has made a significant contribution to HSE advancement in QS Subject Rankings for «Social Sciences & Management» (161st place, ranks 2nd after Lomonosov Moscow State University) and in QS Subject Rankings for «Development Studies» (51-100, the only Russian university).

1.2 Project Fact-sheet

Key STRA-U Subdivisions and Associated Units:

Graduate School of Urbanism https://urban.hse.ru/en/

- International Laboratory for Experimental Urban Design (to be opened in 2016)
- Laboratory for Spatial Data Analysis
- Laboratory for the Field Sociology Research
- Laboratory for Advocacy Planning
- Laboratory for Adoptable Urban Governance (to be opened in 2017)
- Urban-Planning Projects Evaluation Center (to be opened in 2017)

Institute for Transportation Economics and Transportation Policy Studies https://www.hse.ru/en/org/hse/itetps/

- Transport Policy Studies Research Center
- Transport Problems of Megalopolises Research Center
- Transportation Modelling Research Center
- Transportation Economics Research Center

Higher School of Urbanism is only 5 years old but it has already demonstrated a number of achievements:

- It has been twice selected as a Program Directorate for the International Moscow Urban Forum (2015,2016), www.mosurbanforum.com;
- It started International Summer School (2015) on Adaptable Cities;
- It started a series of weekly master classes on Urban Data;
- It has launched International Laboratory on Experimental Urban Design under the leadership of world famous architect Vicente Guallart;
- It has developed two Master's programs in English ready for launching in 2016 and 2017.

ITE&TPS has been working on following flagship projects:

- "Strategy 2020": creating the development plan for national transportation system;
- "The strategy of Moscow socio-economic development to 2025": prepared the transportation chapter of program;
- Consulting and development: "Avtodor" company: audit of public private partnership, creation of the strategy;
- Consulting: The Moscow city government; analytical support of transport policy and activities of the Department of Transportation; ITE&TPS is a member of jury international competition of Moscow metropolitan area concept;
- Research "Russian Travel Survey": a joint project ITE&TPS and Institute of Sociology of Russian Academy of Sciences."Skolkovo": ITE&TPS is a member of Skolkovo town-planning council.

STRA-U Research Adviser: Guallart Vicente, the head of HSE International Laboratory for the Experimental Urban Design, professor of Institute for Advance Architecture of Catalonia.

STRA-U Academic Leader: Novikov Alexei, Professor, Dean of the Graduate School of Urbanism

Key Educational Programs and Their Development

Master program «Governance of the urban spatial development» (in Russian). The program is structured for urban planners and urban researchers who potentially can work with modern urban agenda no matter where they are employed (government, development and real estate business, academia). Sixty seven students are currently pursuing this program, and three of them are international. Academic Supervisor: Elena Shomina, Full Professor, PhD.

Key Russian partners: MARCHI (Moscow Architectural Institute), Strelka Institute of Media and Design, MARSH, Institute for the General Plan of the City of Moscow - joint professional activities, exchange of students and professors, joint master programs. Key overseas partners: Institute for Advance Architecture of Catalonia (FabLab network); L'Ecole d'Urbanism de Paris (Student and Professor Exchange); State University of Miami (FabLab network). The program aims to provide fundamental training to professionals in urban planning, urban governance and urban research.

Master program «Advanced Urban Design» (in English). The first intake of students into this program is scheduled for 2016. Academic Supervisor: Novikov Alexei, PhD. The program is structured for urban planners, urban design specialists and researchers capable of conducting research-based design practices. Key Russian partners: Strelka Institute of Media, Architecture and Design – joint master program. International professors from European and American universities will deliver some program courses.

This is an experimental program for professionals in urban planning and design, and its key objective is to introduce research-based design to the urban planners. Program curriculum includes workshop series featuring international experts in urban planning, which is a new method of teaching in this field. The program will support STRA-U's research projects in experimental urbanism, including post-city studies, development of instruments and institutes in supporting urban planning. Part of the program is focused on critical planning, which is an integral part of advocacy planning (one of the STRA-U's research projects).

New Master's program "City and Technologies" is scheduled for launching in 2017. The program will be supervised by Vicente Guallart, professor at the Institute for Advanced Architecture of Catalonia and the head of HSE International Laboratory for the Experimental Urban Design. The program is tailored for urban planners and urban researchers. This will be a joint program with the Institute for Advanced Architecture of Catalonia, and its graduates will receive international degree certificates. The list of key partners also includes the Moscow Institute of Architecture, Strelka Institute of Media and Design, Moscow School of Architecture, Institute for the General Plan of the City of Moscow and Miami University.

This fundamental program equips the professionals in urban planning, urban studies and urban management with new planning tools and new research ideology based on up-to-date approaches to city environment and urban society. The program will support the research projects of the HSE International Laboratory for the Experimental Urban Design, which will in its turn serve as the testing ground for new ideas and prototypes.

Key Research Projects and Their Development

With regards to its project activities, STRA-U is aiming to create an international educational and research hub on urban studies, experimental urbanism, advocacy planning and adaptable urban governance, institutional economy, transportation & traffic engineering, road pricing, math modelling of urban movements and traffic flows, big data analyses for the development of urban planning and transportation systems compatible with the ideology of "Digital Age Urbanism and Transportation» or "Mobility 4.0".

Among the key projects are the following:

1. Experimental Urban Design

The project is carried out by the International Laboratory for the Experimental Urban Design under the leadership of Vicente Guallart.

Strategic plans for cities and sites related to Self-sufficient Cities, Ecological Urbanism, Mobility and overall Urban Transformation will be developed. All these studies should be oriented to define a long-term plan, a strategic one, structured in order to facilitate the short-term small projects and concrete urban transformations. In this case, STRA-U could operate to help urban governments in the organization of competitions and other types of engagement into city development.

The other areas of research include technological plans for the development of information communication technologies (ICT) in cities; general plans for cities and regions, in collaboration with local and international organizations. In this case the studies will aim to define a long term strategic vision for the implementation of information technologies in the different fields of urban transformation and their regional impact. The latter represents a crucial factor in the extensive territory of Russia and other emerging markets.

Prototype projects, concentrated around the borderline between research and urban transformation policies, will be implemented. The prototypes will serve as testbed for a broader implementation of such projects in the cities world-wide. Prototype projects could stem from the work developed both by students and researchers. From this point of view, the ability of the STRA-U to produce real short-term outcome in Moscow, Russia and other countries will be crucial.

2 Advocacy planning

The project has been developed by the Laboratory for Advocacy Planning and will be continued in collaboration with the Center for Adoptable Urban Governance. Project supervisor - Kristina Ishkhanova, head of the HSE Laboratory for advocacy planning, https://urban.hse.ru/en/lap.

The project's goal is to create a public advocacy planning practice, which could support urban conflicts resolution and represent various stakeholders in the urban planning process.

For the moment advocacy planning is not a common practice yet. Some elements of it such as fairness and equality evaluation of urban projects do exist in some countries, but still need to be reinforced by reputable professional practice institutionalized in a way similar to regular civil advocacy.

STRA-U has been developing a framework of advocacy planning with the idea to create a competitive environment for planning expertise and decision-making that supports public planning debates.

Along with advocacy planning ideology, STRA-U is developing a system of adoptable urban governance practices that are based on multi-jurisdictional conventions among those urban jurisdictions that aim to resolve some common issues (planning, garbage collection and disposal, tariff setting, social protection of population, etc.)

3. Modelling of Transportation Flows

Project supervisor: Pavel Kozlov, director of the HSE Centre for Transport Modelling, https://www.hse.ru/en/org/hse/itetps/en_goals

STRA-U is one of the world leaders in transportation flow modelling. The unique set of simulation instruments allowing to cope with multi-modal effects and other non-trivial side factors caused by growth and dissipation of traffic jams in critical nodes of the traffic system has been created here on the basis of standard programming complex AIMSUN. It has been tested in such large-scale project as transportation flow plan for 2018 International Football Cup.

The project is supported by our applied mathematics and computer science colleagues who are helping with the development of new design concepts for "large" transportation models for megacities.

The ideology of the simulation software such as (CUBE, EMME/3, PTV VISSUM, AIMSUN, TRANSCAD, TRANSNET) becomes outdated in the current environment that is now filled with valuable real-time high-precision data. The purpose of the project is to create a new generation of transportation models capable to work with new types of datasets. This will allow to reduce the scope of over-simplified assumptions down to minimal level, and increase the precision of the models output.

4. Road pricing

Project supervisor: Konstantin Trofimenko, director of the HSE Transport Problems of Megalopolises Research Center, https://www.hse.ru/en/org/hse/itetps/en_goals.

STRA-U is a Russian leader in generating the road pricing ideas, including electronic road pricing. One of the practical implementations was the introduction of toll parking regime in Moscow, preparatory work for congestion charge policy in Kazan, and others. STRA-U is also developing a new road pricing system, known as «Pay-as-You-Go Tax». This trendy system is expected to be implemented in many countries of the world as it allows introduction of road pricing per 1 km no matter where cars are going. It also assumes differentiation of tariffs across categories of cars, roads, users, etc., making the whole system agile and adaptable.

The academic challenge of the project is to find a balanced tariff network compatible with so called "Wardrop's Second Principle" assuming a system (social) optimum. Adaptation of the legal framework is also required.

Connections between research and educational programs are defined in the Key Educational Programs and Their Development section.

Key external parties who benefit from STRA-U's activities

– Local governments (Moscow and the like),

– Federal government (Ministry of Transportation, Ministry of Construction and similar governmental agencies world-wide),

– Agency for Housing Mortgage Lending and its counterparts and replicas in Russia and world-wide.

STRA-U infrastructure

Most STRA-U equipment is concentrated in the Fab Lab led by Vicente Guallart. Fab Lab is easily scalable infrastructure, able to modulate growth and initial expenses. Worldwide, all the Fab Labs share similar machines in order to be equal members of the network they form and be able to share projects and initiatives. Depending on the specific function or interest of each Laboratory, they can have other machines and technologies. The following items have been approved for purchase as of today: laser cutter, 3D Printer, Shopbot milling, vinyl cutter, electronics and programming computer equipment.

Current STRA-U Personnel Composition: average number of academic personnel per year – 28, average age of academic personnel – 39, share of academic personnel holding an academic title – 48%, Key academic personnel profiles can be found in sections Key Research Projects and Their Development and STRA-U Structure and Management System this Project Fact-sheet.

Academic Personnel Development

– Recruiting professors and research fellows from the international market (concrete plans are available for each master program and the international laboratory).

– Active positioning on the Russian market in order to recruit junior research personnel.

Additional information on personnel development is available in section 2.5.

STRA-U Structure and Management System

STRA-U Urban and Transportation policy: guiding urban transformation from industrial to digital age belongs to the second type of STRA-U. Sections 2.1, 2.2, 2.6 contain further information on STRA-U structure, planned organizational changes, level of autonomy and governing bodies' functions.

STRA-U Governing Board (Heads of Key STRA-U Units)

1. Mikhail Y. Blinkin, Director of the HSE Institute for Transport Economics and Transport Policy Studies, https://www.hse.ru/en/org/persons/27235691;
2. Alexei Novikov, Dean of the Vysokovsky Graduate School of Urbanism, https://www.hse.ru/en/staff/avnovikov;
3. Vera Leonova, Vysokovsky Graduate School of Urbanism;
4. Konstantin Trofimenko, director of the Transport Problems of Megalopolises Research Center, https://www.hse.ru/en/org/persons/47123990.

STRA-U International Expert Committee

1. Blair Ruble. Vice president for programs; director, urban sustainability laboratory; and senior advisor, Kennan institute urban sustainability laboratory;
2. Piotr Lawrence, President of International Society of City and Regional Planners (ISOCARP), Head of Urban Design and Urban Planning, Faculty of Architecture, University of Technology, Gdansk;
3. Lawrence Barth, Senior Lecturer, MA Housing & Urbanism and MA Landscape Urbanism;

4. Robert Ravelli, Strategic Master Planning and Transport Planning, Contemporary Solution Consulting, London, United Kingdom;

5. Lev Manovitch, Professor, Digital Humanities, City University of New York;

6. Claudio Silva, CUSP's Head of Disciplines, Professor of Computer Science and Engineering at NYU's Polytechnic School of Engineering, affiliate faculty at NYU Courant Institute of Mathematical Sciences, and a visiting professor at Linköping University in Sweden.

1.3 Performance Indicators of Strategic Academic Unit

№	Indicator	2015 actual	2016 plan	2020 plan
1.	Position in broad field (specific subject) rankings (ARWU, THE, QS) as university KPI for which the STRA-U is valuable (according to the "roadmap" of the relevant university)			
1.1.	QS «Social Sciences & Management» by faculty	161		51-100
1.2.	QS «Development Studies » by subject	51-100		51-100
2.	Number of publications in the Web of Science per one faculty member of the STRA-U	0,72	0,82	1,90
3.	Number of publications in Scopus per one faculty member of the STRA-U	0,72	1,06	1,69
4.	Average citation index per one faculty member of the STRA-U calculated on the basis of the total number of publications indexed by the Web of Science	0,47	0,70	1,96
5.	Average citation index per one faculty member of the STRA-U calculated on the basis of the total number of publications indexed by Scopus	0,65	0,97	2,22
6.	Percentage of international faculty in the STRA-U's team including Russian citizens with PhDs from foreign universities	1%	1%	3,5%
7.	Percentage of international students enrolled in higher education degree programs provided by the STRA-U (including CIS students)	4,5%	6%	22,2%
8.	Average Unified State Examination (USE) grade for students enrolled in full-time federal funded Bachelor and Specialist-level programs delivered by the STRA-U	Master's programs only		
9.	Percentage of the STRA-U's income from non-budgetary (non-government) sources	80%	no less than 80%	no less than 80%

1.4 Quantitative characteristics of the STRA-U's development

№	Indicator	2015 actual	2016 plan	2020 plan
1.	Number of higher education degree programs with international professional or public accreditation delivered by the STRA-U	0	0	1
2.	Number of higher education degree programs delivered by the STRA-U entirely in a foreign language	0	0	2
3.	Number of higher education dual degree programs delivered by the STRA-U	0	0	1
4.	Percentage of the STRA-U's students involved in R&D of this unit and enrolled in higher education degree programs provided by this unit, among the total number of students enrolled in the STRA-U's higher education degree programs	10,45%	11%	11%
5.	Percentage of the STRA-U's students enrolled in higher education degree programs among the total number of students enrolled in higher education degree programs of the relevant university	0,33%	0,61%	0,67%
5a.	Same for Bachelor-level programs (Specialist-level)	0%	0%	0%
5b.	Same for Master's programs	1%	2%	2%
5c.	Same for Ph.D. programs	0%	0%	0%
6.	Percentage of the STRA-U's faculty members who authored publications indexed by Scopus or the Web of Science among the total number of faculty of the STRA-U	25%	39%	72%
7.	Percentage of the STRA-U's employees among the total number of employees of the relevant university	1,0%	1,0%	1,0%
8.	Number of intellectual deliverables/intellectual products (IP) created by the STRA-U's employees	0,00	0,00	0,00
9.	Source-Normalized Impact per Paper (SNIP) of journals indexed in Scopus where the articles authored by the STRA-U's faculty members were published in the reporting year	0,858	0,93	1,20

1.5 Financial Model

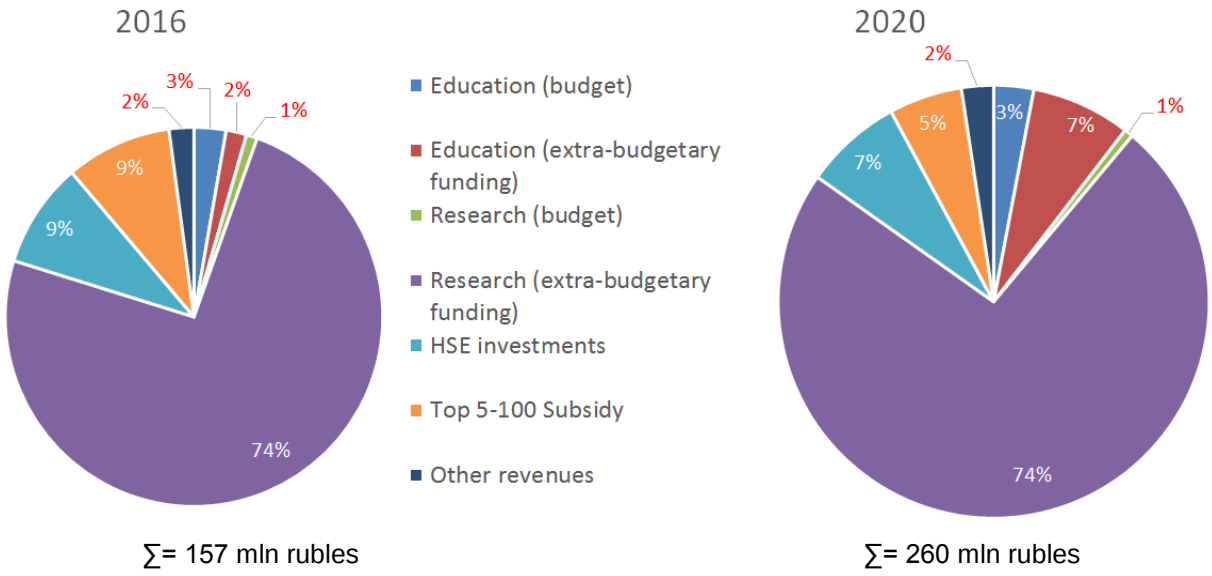
STRA-U budgets are managed by the university and heads of participating units; they are financed from the following three sources:

1. **Government-funded education and research projects**. STRA-U contribution to the government projects is relatively modest, due to low share of state-funded students in the STRA-U programs.

2. Funding from **external sources** (extra-budgetary revenues) derived from fee-based educational services, research and expert review projects in the interests of the government and corporate clients, donations and other special purpose contributions. The share of the STRA-U extra-budgetary revenues is expected to be no less than 80 % in 2020. Funding from external sources is one of the KPIs of the STRA-U's units heads.

3. **HSE special purpose funds** provided to STRA-U units for development (academic development funds, centralized HSE programs such as Academic Fund, Fund of Educational Innovations, etc., acquisition of special research and laboratory equipment, inviting international faculty and researchers, etc., including funds of the subsidy under Global Competitiveness Program).

Planned STRA-U's sctructure and revenues dynamics:



∑= 157 mln rubles ∑= 260 mln rubles

The growth in the STRA-U revenues in the period of up to 2020 will be achieved thanks to the increase in the scope of R&D and expert review projects in the interests of governmental and private clients in the following areas: urban development and spatial planning, urban construction management, transport policy. The STRA-U is planning to focus more on independent expert review projects covering urban planning documentation and urban zoning.

The STRA-U develops urban planning documentation and strategic plans based on the concepts of self-sufficient city, ecological urbanism, city mobility and transformation. The STRA-U areas of expertise also include transport development plans, transport flow models, urban legislation, analytical support for transport policy projects, transport programs evaluation, research in economics and transport management.

The list of the STRA-U clients includes Moscow government, city administrations in various Russian cities, state and private agencies, development companies and technological companies.

The scope of fee-based educational services will expand, most notably thanks to the new English-taught Master's programs – Advanced Urban Design and City and Technology, and continuing education programs, including special personnel training at the request of HSE clients.

In the next 3-5 years, the revenues from mass online courses are expected to grow steadily both on international platforms and in Russia – in line with the development of the National Open Education Platform. The STRA-U is planning to launch online courses in the field of urban studies, transport policy and city transformation in digital era.

STRA-U's units will continue to actively participate in research grant programs of Russian funds, most notably in such fields as urban development, city data analysis and economics of transport. In case of improvements in the international market situation, the revenues from participation in international research grant programs are also expected to go up.

Total increase in the STRA-U revenues in 2020 versus 2016 will be no less than 60% (100 mln rubles). As compared with the funds received by the STRA-U under Global Competitiveness Program, the anticipated income growth will exceed 700 %.

STRA-U expenditures include personnel salaries (68-72%) and other operating expenses (teaching and research process, academic mobility, acquisition of information, etc.).

General and administrative expenses are centrally managed by HSE. All facilities, dormitories, IT infractructure and administrative services are provided by the university.

The STRA-U's financial stability is achieved through the combination of revenues from all types of its operations and HSE investments – through centralized academic development instruments (programs and projects). HSE is ready to provide additional resourses to the STRA-U by reallocating HSE's centralized funds if necessary.

1.6 Schedule (Roadmap) for controlled changes

		Years				
№	**Objective**	**2016**	**2017**	**2018**	**2019**	**2020**
	1. Organizational changes					
1.1.	STRA-U organizational structure is formed, including team, leadership, and collegial and executive management.	X				
1.2.	Project teams are formed, informational and material resources required for their work got identified and located.	X				
1.3.	Changes in STRA-U organizational structure and personnel schedule	X	X	X	X	X
	2. Changes and results of educational activities					
2.1.	Master program "City and Technologies" to be launched in 2017.		X			
2.2.	Master program "Advanced Urban Design" to be launched in 2016	X				
2.3.	International Laboratory for Experimental Urban Design got started under the ledership of Vicente Guallart. Expect to be globally recognized urban research center by 2020	X	X	X	X	X
2.4.	International Summer School on Adptable City in collaboration with professors from CUNY, CASP, Sidewalk Lab, Science Po, L'Ecole d'Urbanism de Paris, IaaC, Imperial Colledge, etc.	X	X	X	X	X
2.5.	On-line courses to be developed (English Language)			X	X	X
2.6.	Visiting professors from key urban research centers	X	X	X	X	X
2.7.	Visiting speakers at weekly urban seminars/masterclasses in representing key trends in the profession (triple the number of master classes by 2020 г.as compared with 2016 г.)	X	X	X	X	X
2.8.	Remote (Skype, Webex) lectures of foreign professors (double the number by 2020 г. compared to 2016 г.)	X	X	X	X	X
2.9.	Short-term professional courses for civil servants employed by urban planning authorities including ones from foreign countries		X	X	X	X
2.10.	Trainings in experimental urban design (prototyping) – up to 500 participants, and 50 companies and universities between 2016-2020	X	X	X	X	X
	3. Changes and outcomes of research and science and technology activities					
3.1.	Applied project studies in the field of urban planning and transport	X	X	X	X	X
3.2.	Add foreign research fellows to STRA-U research personnel on a competitive basis	X	X			X

3.3.	Competition among young researcher and urban professionals from other research institutions and universities	X	X	X	X	X
3.4.	Involvement of students and post-graduates in research projects	X	X	X	X	X
3.5.	Professional training and internships of the research personnel	X	X	X	X	X
3.6.	Lectures, master-classes, seminars of the leading foreign scientists and specialists-practitioners	X	X	X	X	X
3.7.	Organization of international conferences (twice a year)	X	X	X	X	X
3.8.	Journal "Urban Studies and Practices" to join Web of Science				X Application	X Acceptance
3.9.	Publication of books (in English) in Springer		X		X	X
3.10.	Publication of English language preprints (HSE Working Papers Series) 'Urban and transportation studies'	X	X	X	X	X
3.11.	Regular international expert review of STRA-U activities within the framework of International Advisory Board	X	X	X	X	X
3.12.	Development of research infrastructure, including the one of the Laboratory for Experimental Urban Design	X	X	X	X	X
3.13.	Development of PHD program					X
	4. General changes and results, including HSE as a whole					
4.1.	Facilitating the HSE achievement of leading positions in the education and research at the regional and global level, evidenced by the promotion in global rankings	X	X	X	X	X
4.2.	Reduction of the dependence on budgetary sources	X	X	X	X	X

2. TRANSFORMING THE UNIVERSITY BY ESTABLISHING THE BREAKTHROUGH AREAS ACROSS STRATEGIC ACADEMIC UNITS

2.1 Organizational Transformation of the University

HSE is in the process of systemic transformations, first launched by the university in 2010, and aims to create centers of excellence and to disseminate the experiences of these centers throughout the university.

In the first stage of transformation, the university established 10 international laboratories lead by the prominent foreign researchers. The development of international laboratories in economic, social, computer, and mathematical sciences has contributed to overcoming the long-term isolation of Russian social and economic sciences and enabled HSE to join the global network-based research market and strengthen the university's position as the center of advanced research in select areas of expertise. As a result of the university concentrating its resources on the development of those areas, the number of research publications in the international databases Web of Science and Scopus has grown five times over the last five years. Globally renowned scientists such as Nobel Laureate Eric Maskin, Fields Medal Winner Andrei Okounkov have joined the university. The number of international laboratories grew to 22 in 2015 and these research centers have enabled the university to integrate the new academic culture into more traditional forms through the creation of faculties and moving further to the next transformation stage.

The second stage in the transformation of the university's organizational model is the transition from highly specialized faculties and academic departments, designed with the primary purpose of teaching, to the model of mega-faculties, or large research and education units conducting research (including multidisciplinary research) and faculty training in broad areas of expertise: economic sciences, social sciences, business and management, humanities, computer and engineering sciences, mathematics, law, communications and design and urban studies. The integration process was completed in 2015 when 21 faculties and division networks were replaced with 10 mega-faculties. The former faculties and academic departments became departments and schools, and mega-faculties were merged with previously independent HSE research units to conduct basic and applied research and focus on expert analytical work and consulting. The new organizational model is currently finalizing its operating mechanisms.

The university merger of interrelated fields of expertise encourages the development of promising research areas at the intersection of sciences and ensures the principle of crossdisciplinary interaction in research and teaching. This contributes to the rapid development of the mega-faculties' educational programs built into the framework of new fast-growing areas of expertise that are implemented by research scientists, key employers, international experts; students become involved in real scientific research projects while still in the training. Such integration is provided by research units, departments and schools within the mega-faculties.

The conversion ensures an integrated approach to mega-faculties-based management and the development of all areas of the university's expertise, including higher education and continuing education, basic and applied research, innovation, expert analytical work and consulting. International laboratories still act as the drivers of research, set standards for other research teams and play an important role in graduate and postgraduate education. Regular evaluation of laboratories' performances by internationally recognized experts constitutes the basis for decision-making on the laboratories' existence. Mega-faculty management is based on the principles of academic self-governance, which is implemented at all levels of decision making.

In 2015, the right to managing independently financial resources and the responsibility for achieving planned results (KPIs for the mega-faculties' deans are set) were delegated to the mega-faculties. This significantly simplified the decision-making process, allowed more specific considerations on account of individual disciplines and enhanced their development. Currently, almost 50% of resources from the university-wide academic development fund (scholarships for

academic mobility of faculty members, researchers and students, conferences, etc.) are managed by the mega-faculties. The mega-faculties' academic development funds are competitively distributed in accordance with the decision of mega-faculties' governing bodies, composed of researchers and instructors. The mega-faculties' academic and financial autonomy will be further increased; resources will be managed and decisions made based on KPIs.

The university is currently in the third stage of its transformation: HSE continues to improve the mega-faculties and establish better conditions for their development through the individual research and education units under these new interdisciplinary centers of excellence. The centers use the mega-faculties' infrastructure, human and other resources and have become growth points for promising areas where the university intends to enter the global market. Successes have been achieved in some subject areas as evidenced by high quality publications in the leading journals (See sections below).

2.2 Strategic Academic Units

The mega-faculties and research units (including international laboratories) are used to establish large areas of expertise with interdisciplinary connections: Strategic Academic Units (STRA-Us). There are two types of STRA-Us – international consortia and centers of excellence, which are currently being formed based on the following criteria:

1) Research must be consistent with the global research agenda and international research networks;

2) Research must be relevant to Russia's geopolitical interests and/or sectoral priorities;

3) STRA-Us must serve as expert analytical centers for the development of public policy in the economic and social sectors, education, science and technology forecasting and state-building; each STRA-U should make a significant contribution to the development of Russian economy;

4) Educational programs are implemented at various levels (undergraduate, specialist, graduate and post-graduate programs).

The first type of STRA-Us includes major consortia that address the university's existing core areas. They are recognized internationally (reflected in their international rankings), and have a high capacity for further dynamic development. These consortia are formed from one or more mega-faculties and academic units of the university, which implement educational programs at all levels and their research has been integrated or is capable of being integrated into the global research agenda:

– Economics and Management (QS Economics & Econometrics – 151-200, QS Development Studies – 51-100, QS Social Science & Management – 161[1]);

– Challenges for Social Development (QS Development Studies – 51-100; QS Sociology – 151-200; QS Social Sciences & Management – 161);

– Mathematics, Computer Science and Information Technology: scalable mathematical methods (QS Mathematics и QS Computer Science & Information Systems – 400+, ranks 6th in Russia);

– Humanities Consortium "Humanus" (QS Philosophy – 151-200, QS Arts & Humanities – 289).

The second type of STRA-Us includes centers of excellence: individual structural units that have been created as new growth points in relatively narrow and promising interdisciplinary areas of research and education and are integrated into the global research agenda and implement

[1] HSE position in QS World University Rankings 2015 (by subject and by industry) are given in brackets. This position has been secured thanks to the contribution of the respective STRA-U.

Master's and doctoral educational programs. In the long run, these units are capable of growing into new research and educational areas:

– Foresight and Science, Technology and Innovation Studies (QS Development Studies – 51-100; QS Social Sciences & Management – 161);

– Cognitive Neuroscience: from Computational Models to Neurotechnology (QS Economics & Econometrics – 151-200; QS Social Science & Management – 161);

– Education and Human Development in changing world (QS Sociology – 151-200; QS Social Science & Management – 161);

– Urban and Transportation policy: guiding urban transformation from industrial to digital age (QS Development Studies – 51-100; QS Social Sciences & Management – 161).

Not included in STRA-Us are key HSE faculties such as World Economy and International Affairs, Law, and Communications, Media and Design, as well as the Department of Foreign Languages, because these units are currently focused mainly on the Russian market.

Strategic Academic Unit Management

Each Strategic Academic Unit is managed by:

– the research adviser, a leading scholar in the STRA-U area, well known by the international academic community, whose main functions are to establish the STRA-U research and education agenda and strategies, help enhance STRA-U leadership within the international academic community and engage STRA-U leading experts in relevant fields;

– the leader, a famous academic and experienced research and/or education administrator whose main functions are to ensure achievement of STRA-U goals, coordinate reseach and education communication among the divisions within STRA-U and make personnel and financial decisions.

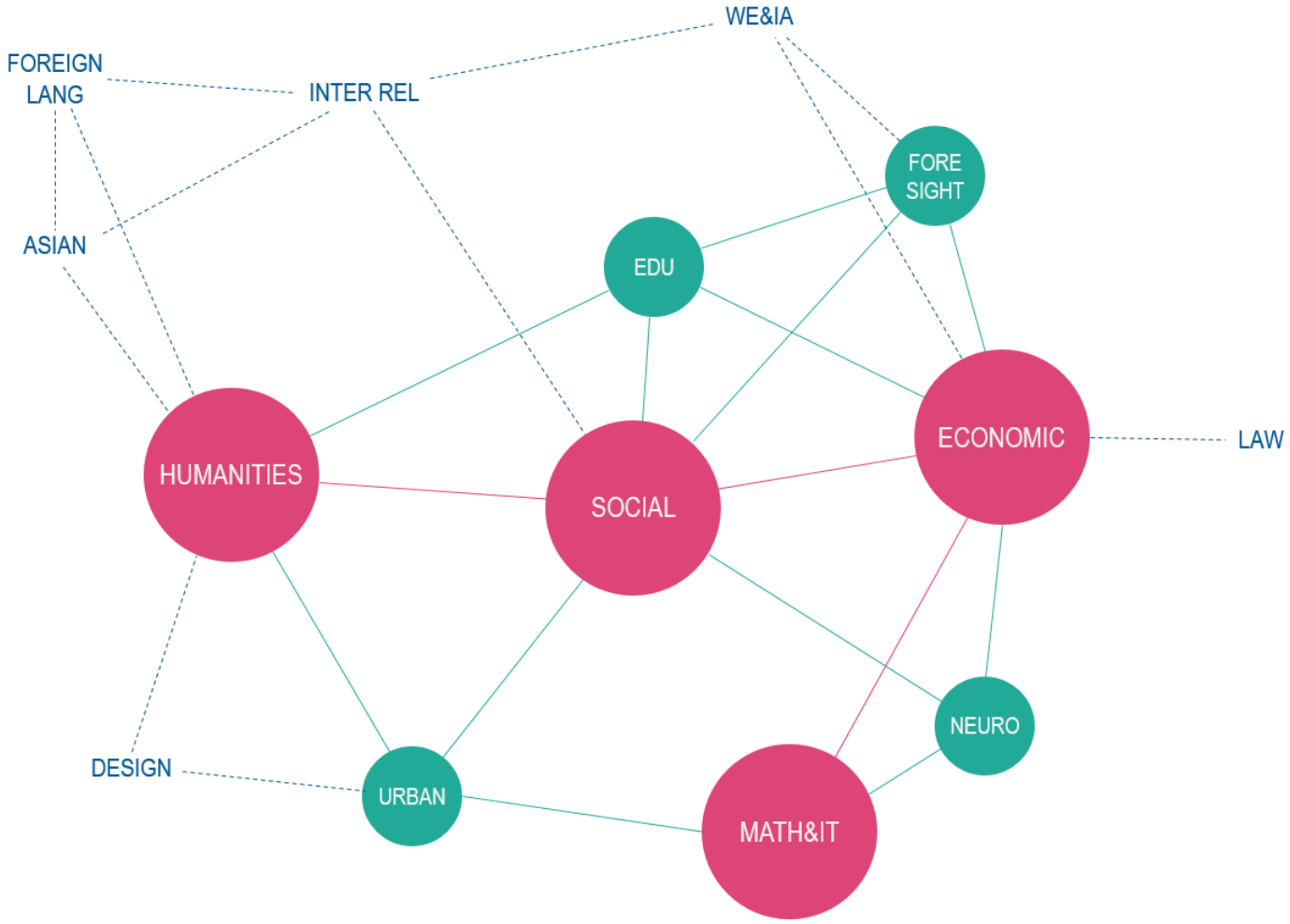
STRA-U is managed by the Management Board, which makes programmatic and resource decisions on each of the STRA-U's tasks delivery and ensures monitoring of STRA-U's tasks delivery.

Some STRA-Us have already established International Expert Committees and others will establish them by the end of 2016. International Expert Committees will conduct external evaluations of STRA-U research and educational activities and provide recommendations regarding STRA-U development strategy. They will also promote international partnerships and the integration of STRA-U researchers in international research networks.

The university's management practices have been tested within the mega-faculties model and have proved to be viable and effective. They will also be used in the next stage of the university development within STRA-U's framework (see more details in respective sections of each STRA-U fact-sheet).

The scheme of interaction between STRA-Us and other units that haven't been integrated as a STRA-U yet is defined in the following figure.

STRATEGIC UNITS INTERACTIONS



StraU's of I type
CONSORTIUMS

>ECONOMIC< ECONOMICS AND MANAGMENT **>**
>SOCIAL< CHALLENGES FOR SOCIAL DEVELOPMENT **>**
>MATH&IT< MATHEMATICS, COMPUTER SCIENCE AND INFORMATION **>**
>HUMANITIES< SCHOOLS AND INSTITUTES CONSORTIUM «HUMANUS» **>**

StraU's of II type
CENTERS OF EXCELLENCE

>FORESIGHT< FORESIGHT AND SCIENCE, TECHNOLOGY AND INNOVATION STUDIES **>**
>NEURO< COGNITIVE NEUROSCIENCE: FROM COMPUTATIONAL MODELS TO NEUROTECHNOLOGY **>**
>EDU< EDUCATIONAND HUMAN DEVELOPMENT **>**
>URBAN< URBAN AND TRANSPORTATION POLICY: GUIDING URBAN **>**

OTHER UNITS

2.3 Research and innovation activities

Research and science project areas are described in detail in each STRA-U Fact-sheet.

HSE strategy for basic research sets rigorous requirements for research quality, and personnel incentives are aimed at facilitating research in the most cutting-edge areas and topical fields. This has caused a significant growth in the number of quality publications. Articles by HSE faculty and researchers are published in top international journals, including Review of Economics and Statistics, Acta Mathematica, Journal of Personality and Social Psychology, The Lancet, IEEE Transactions on Pattern Analysis and Machine Intelligence, Nature Genetics, Journal of Political Economy, Physical Review Letters, American Economic Review, Behavioral and Brain Sciences, Journal of Materials Processing Technology, Annals of Statistics, Communications in Mathematical Physics.

The university has robust research and innovation cooperation with major Russian and foreign companies and organizations which are not only customers of research and consulting projects but also partners in implementation of customized educational programs of mainstream and continuing education. The demand for the university's research is evidenced by steady growth in R&D total revenues, which is currently almost 40%. HSE has partnership relations with such major companies as Gazprom, Rosatom, Rosneft, Novatek, Gazprom Neft, Alrosa, Norilsk Nickel, Aeroflot, Rosgeologiya, Nissan, Sibur, Gazprombank, Lukoil, Transneft, Yandex and others. HSE is constantly expanding the network of joint departments (currently - 40) established in cooperation with leading research and science centers, global consulting companies, ICT companies, analytical centers, and others.

The university's innovative activities are designed to provide diverse forms of communication with project teams which include undergraduate, graduate and post-graduate students, professors and research scientists. Those activities range from annual competitions of business plans for innovative projects to supporting the start-ups at various stages of maturity. A prominent place in the Russian innovation ecosystem is taken by the HSE's Business Incubator which provides coaching and advisory services to student teams; the Innovation Center which provides organizational support to the spin-off companies, and Prototyping Center that provides an experimental platform for technological projects and boasts state-of-the-art equipment.

According to UBi Global rating, in 2015, HSE Buisness Incubator ranked 14 among global university busness incubators (sole university business incubator in Russia to rank in global Top-25).

2.4 New organizational model for the education process

Establishing mega-faculties through the merger of academic units has enabled the implementation of a university-wide organizational and management model for the education process on the basis of "academic adviser - academic council - student office". In spite of a wide variety of programs, the quality of the education process and outcomes is ensured by general principles incorporated in the unique educational standards aimed at a higher level of complexity.

The implementation of undergraduate programs is based on a model that provides for:

– a limited number of courses (no more than five) to be studied by a student in any given semester, at least half of which are electives;

– a fixed part of the program within which a student works on projects and research papers primarily in actual research departments at the university;

– select clusters of courses (minors) available to all students (20 ECTS in two years);

– independent assessment of students' knowledge of the English language at the end of the second year through the process of international exams, and mandatory study of at least two major courses in English;

– mandatory preliminary thesis defense in English.

The implementation of graduate programs is based on the following model:

– no more than 12 courses to be studied by students over two years;

– two professional "core" disciplines (the second disciplines is to be selected by the academic program management and by the students themselves);

– research and independent work must constitute at least 70% of the load;

– opportunity for first-year students to select courses from the general pool of disciplines with broad humanities, social science and economic focus (MagoLego).

HSE's educational programs are focused on the international market: the share of foreign students is currently 7.5%; 18% of disciplines are taught in English; 15 programs in the current academical year and 20 programs in the new academic year will be fully focused on English-speaking students; 43 (29%) educational programs are implemented in partnership with leading foreign (41) and Russian universities (2). HSE is actively involved in the work of universities' consortium representing massive on-line courses on Coursera international platform: in 2015, over half a million students from 195 countries, representing 5% of all Coursera students, signed up for 36 HSE's online courses taught in Russian and English.

2.5 Development of Academic Personnel

Academic personnel development within the new STRA-U framework will be provided by the instruments of academic development and through competitive procedures established in HSE in recent years and described in detail in the Roadmap of the Program for Enhancing HSE Competitiveness of the second stage.

The main instrument for attracting international experts is the international recruitment strategy, which has been in place at HSE since 2010. The ruble devaluation has significantly restricted Russian universities' capacity to compete as employers in the global academic market; therefore, specialist recruitment on the international market in 2016 will change: most cited scientists in high demand by strategic academic units will be selected through the international recruitment procedure. Foreign researchers will be engaged in scientific projects under short-term contracts and remote work contracts. Particular emphasis will be placed on engaging talented young scientists in international research projects through the postdoctoral research fellow program, which will be enhanced starting from 2016.

Mandatory engagement of faculty members in research and involvement of researchers in the educational process is guaranteed by the single contract with academic personnel implemented by HSE in 2015. Faculty members' teaching load is alleviated by teaching assistants, who are selected from among the best students and thus get a chance to start their academic career. Personnel rotation and academic faculty selection is performed through creating competitive academic environment - an open competition for academic faculty positions is held annually and attracts many external candidates. The competition procedure involves the multi-stage selection of candidates: evaluation of research, professional level, interviews, and open lectures. The selection is carried out by expert subject committees, mega-faculties' personnel, and the personnel committee of the HSE Academic Council. The open procedure and similar evaluation criteria for HSE professors and external candidates provide conditions for the selection of the best specialists to be employed by the university on a full-time basis. They meet the university's requirements focused on the global market: HSE academic faculty was renewed approximately by one third in 2013.

The merit-based personnel selection system is supported by a wide range of incentives that provide for professional development and the opportunity to select the optimum academic path for each faculty member. The instruments include stipends for publications at the international level, contributions to the university's reputation, teaching courses in English, development of new teaching methods and training courses, individual and collective research and academic mobility scholarships, international partnership development scholarships, comprehensive professional development program which includes internships and PhD

education at foreign universities and academic English courses at Academic Writing Center. All of these procedures are carried out on a competitive basis.

HSE strives to create an English language-driven professional environment and to ensure the smooth integration of international students, faculty members and researchers into the university academic life. HSE has established special administrative units that provide guidance to international students and academic personnel in all aspects of the HSE experience (including medical insurance, social support, etc.). The university has created English language information resources and hires program coordinators with fluent English. In the coming years, the number of administrative personnel with English proficiency will be increased, and international faculty members will receive comprehensive information about what is occurring during their employment at HSE.

HSE's target personnel development model suggests that by 2020 at least 60% of academic personnel will be scientists (included in the global academic networks), about 20% will be the leaders of the Russian professional market, and the remaining 20% will be engaged only in teaching (mostly teaching foreign languages). It is also planned that 90% of full-time HSE faculty members will be able to teach and conduct research in foreign languages.

2.6 Financial sustainability and resource allocation for the establishment and development of Strategic Academic Units

Resources for the Program of Enhancing Competitiveness and the university's financial sustainability in general are secured primarily through revenue from core activities (all types of educational services, research and expert and consulting activities). In aggregate, HSE revenues in 2016[2] will exceed 14 billion rubles ($190M), which is higher than the revenue in 2012 by 44%. The university earns about 40% of the funds or 6 billion rubles per year ($80M) in the open market: in terms of extra-budgetary revenue, HSE is among top three Russian universities. Global Competiveness Program program funding constitutes only 6.5% to the university's revenue.

In the years leading up to 2020, HSE will increase its overall revenue by 31% compared to 2015, mainly through extra-budgetary income, of which 70% will come from for-profit educational services, and 20% from applied R&D and consulting services. Overall, by the end of the period the share of extra-budgetary income will increase to up to 44%.

Resources for the implementation of the HSE Roadmap will be gathered by combining centralized incentive mechanisms and increasing the financial autonomy of the units. HSE makes target investments of more than a quarter of its income into the university's development projects. The share of funds managed at the level of research and educational units and their consortia is, on average, more than 50%.

The university's financial model is actually replicated within STRA-Us: the units' financial sustainability is achieved through a combination of revenues from all types of activities and diversification of sources of their financing. The tasks of resource allocation to the units within STRA-Us are reflected both in their budget structure, and in the KPI system of their leaders (see Section 2.1).

Key risks for the financial sustainability of the university and its units in the period of up to 2020 are mostly related to negative economic conditions:

1) the devaluation of the ruble caused a significant reduction in the competitiveness of Russian universities as employers in the international academic labor market; paying competitive salaries becomes increasingly difficult, especially when trying to maintain fair balance between Russian and foreign academics;

2) the devaluation has also resulted in the significant increase of other university costs that depend on currency exchange rates, such as international academic mobility, access to foreign sources of information, purchase of equipment, etc.

[2] Excluding state capital investments

3) reduction of Federal Budget expenditures for 2015-2017 significantly restricts the university's income growth potential, both in education and in research.

The key measures taken by HSE to address those risks are:

- cutting operational and administrative costs (in 2016, operational costs were cut by 15%, administrative personnel costs were cut by 10%, etc.);

- reducing full-time employment of foreign personnel in favor of short-term and remote contracts, without compromising the requirements related to cooperation with Russian personnel and publication activity levels;

- stricter internal requirements related to the efficient utilization of resources: allocation of funds for research projects that foster academic personnel allowances; implementation of economic standards for educational programs and personnel schedule and workload; and introducing indicators for attracting external resources into managers' KPI systems;

- reducing (and closing) administrative and research units and educational programs that do not meet academic criteria of productive efficiency (in particular, in 2014-2015, the Master's programs portfolio was optimised, and a number of academic departments were reorganized).

Information on HSE-Moscow total revenues and expenses in 2015-2020 are given in the table below (mln rubles):

mln rubles

(excluding state capital investments)	2015	2016	2020
REVENUES	13150	13880	16197
Educational services	**7 127**	**8 228**	**10 375**
State assignment for educational services	4 703	5 352	6 176
Fee-based educational services – Higher education	1 331	1 652	2 311
Fee-based educational services – Continuing education	632	695	1 240
Pre-university education	168	301	386
Subsidy for the scholarship fund	293	228	262
Research and Development	**2 577**	**2 568**	**3 000**
State assignment for research	888	862	1 000
Applied research and development	1 690	1 705	2 000
Other revenues (special purpose subsidies, donations, other revenues)	**817**	**1 102**	**1 016**
Funding under 5-100 Program (special purpose subsidy)	**930**	**930**	**930**
EXPENSES	12 099	12 903	15 304
Program and project expenses	**3 109**	**3 364**	**3 969**
Current operating expenses	**7 961**	**7 920**	**9 960**
Special purpose expenses (scholarships, major repairs, taxes)	**1 029**	**1 293**	**961**
Reserves	**283**	**325**	**414**
BALANCE (end of period)	**1 052**	**977**	**893**