



**TRANSPORTA
UN SAKARU
INSTITŪTS**

Scientific Activity Report

2018

This report provides information on the aims and objectives of the research activities, scientific publications of the employees of Institute - articles in journals and collections of articles from the conferences, monographs and patents as well as it identifies priority areas of research, describes the local and international conferences held at the Institute and scientific journals published by the Institute.

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
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TABLE OF CONTENTS

SCIENTIFIC ACTIVITY REPORT	1
1. GENERAL INFORMATION	4
1.1. MISSION, VISION	4
1.2. RESEARCH INFRASTRUCTURE	5
1.3. RESEARCH JOURNALS	10
1.4. RESEARCH STAFF	12
2. RESEARCH OUTPUT	13
2.1. NUMBER OF SCIENTIFIC PUBLICATIONS AND OTHER OUTPUTS	13
2.2. LISTS OF MOST IMPORTANT PUBLICATIONS BY ACADEMIC PERSONNEL AND RESEARCHERS WITH DOCTORAL DEGREE	14
2.3. OTHER SCIENTIFIC PUBLICATIONS.....	16
2.4. TEXT BOOKS AND OTHER RESEARCH-RELATED PUBLICATIONS.....	17
2.5. CONFERENCE ABSTRACTS.....	17
3. MASTER AND DOCTORAL TRAINING / ACTIVITIES.....	22
3.1. NUMBER OF STUDENTS.....	22
3.2. SCOPE OF DOCTORAL PROGRAM ACTIVITIES.....	22
4. CONFERENCES AND OTHER SCIENTIFIC EVENTS.....	24
5. NATIONAL AND INTERNATIONAL COLLABORATION	27
5.1. NATIONAL COLLABORATION	27
5.2. SCOPE OF NATIONAL LEVEL COLLABORATION PROJECTS	28
5.3. INTERNATIONAL LEVEL COLLABORATION PROJECTS	29
5.4. MOST IMPORTANT FOREIGN COLLABORATORS.....	30
5.5. IMPORTANT SCIENTIFIC COOPERATION EVENTS	32
5.6. NON-ACADEMIC COLLABORATIONS	33
6. MEMBERSHIPS IN BOARDS (JOURNALS, CONFERENCES, ASSOCIATIONS).....	34
6.1. MEMBERSHIPS IN PROGRAM AND ORGANIZATION COMMITTEE OF SCIENTIFIC CONFERENCES.....	35
6.2. PRIZES AWARDED TO RESEARCHERS, HONORS AND SCIENTIFIC POSITIONS OF TRUST	39
6.3. MEMBERSHIPS IN COMMITTEES AND IN SCIENTIFIC ADVISORY BOARDS OF BUSINESS COMPANIES OR OTHER SIMILAR TASKS OF NO PRIMARILY ACADEMIC NATURE	39
7. SUBMITTED PROJECT APPLICATIONS	40
8. FINANCING OF RESEARCH	42

	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

LIST OF FIGURES

Figure 1. Framework for development of the research program of TSI..... 5
 Figure 2. Research Infrastructure 6
 Figure 3. Transport and Telecommunication Journal performance (Scimago) 11
 Figure 4. Transport and Telecommunication Journal performance (Scimago) (2) 11
 Figure 5. Research staff in the TSI Figure 6. Research staff (FTE) at the TSI 12
 Figure 7. Research staff by type 12
 Figure 8. Publication performance and dynamics 14

LIST OF TABLES

Table 1. Journal position based on the KPI..... 11
 Table 2. Scientific publication / outputs, 2018..... 13
 Table 3. Master and Doctoral degree students 22
 Table 4. Scope of Conferences 24
 Table 5. Scope of Workshops and Seminars 25
 Table 6. Scope of Courses 26
 Table 7. Scope of national and international collaboration 27
 Table 8. Scope of National Level Collaboration Projects 28
 Table 9. Scope of international collaboration in projects 29
 Table 10. Scope of important foreign collaboration 30
 Table 11. Non-academic collaboration..... 33
 Table 12. Memberships in boards (journals, conferences, associations)..... 34
 Table 13. TSI staff memberships in Programme and Organization Committees of scientific conferences 35
 Table 14. TSI Staff awarded with prizes and honours in 2018 39
 Table 15. TSI Staff membership in scientific advisory boards of business companies and associations..... 39
 Table 16. Submitted Project Applications (2018) 40
 Table 17. TSI R&D Budget 2018..... 42

	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

1. GENERAL INFORMATION

1.1. Mission, Vision

Mission. The mission of the Transport and Telecommunication Institute (TSI) is to provide fundamental and applied research and teaching in the sphere of high technologies which would be adaptive to the needs of communities locally and globally. We seek achieving our Mission through the international interdisciplinary collaboration under conditions of open cooperative environment.

Our vision for the Research Strategy is:

Research excellence and innovation are integral to the vision of the Transport and Telecommunication Institute. Our goal is to deliver economic, social and cultural impact at national and international levels by providing scientific knowledge of applied and fundamental nature. We participate actively in a high-end international research activities and collaborations to achieve this goal.

The University judge the effectiveness and success of planning and investment decisions about research based on the following set of values:

1. Research excellence

It is a major contributing factor to our positive image and respectable reputation nationally and internationally.

2. Innovation

Above all, we are higher education and research institution involved in high tech applied and fundamental research. We experiment, develop, run project, build collaborations, create a new generation of high-tech professionals all of which has a direct impact on the wellbeing and development of wider community.

3. Research-informed education

We believe a high-quality education starts way beyond text books and unrelated set of theoretical ideas. Instead a worthwhile education means bringing students to the edge of the most contemporary research, engage them in scientific work, bring applied tasks to the classroom and bring students to the real-world business and industry as part of their education.

4. Expertise

We value the expertise of our staff and students and are committed to supporting them in reaching full research, personal and professional potential.

5. Self-sustenance

We believe researchers can be successful part of the private sector bringing added value to the business partners, clients and the community. We believe contemporary research environment can be competitive, demanding, challenging and, simultaneously, extremely rewarding. This, we are

	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

committed to maximizing the income associated with our research and through this providing the sustainable environment needed to enhance our research.

In the framework of values set above, the TSI:

- supports the high-quality research and develop collaborations that enhance the multilayer mutual reinforcement of scientific, technological innovation, education and social impact area of the Institute activities.
- supports and develops proven expertise research professionals within a self-sustaining research environment.
- actively participates in outreach and information dissemination activities to advance knowledge and innovation to the wider economic and societal benefit.

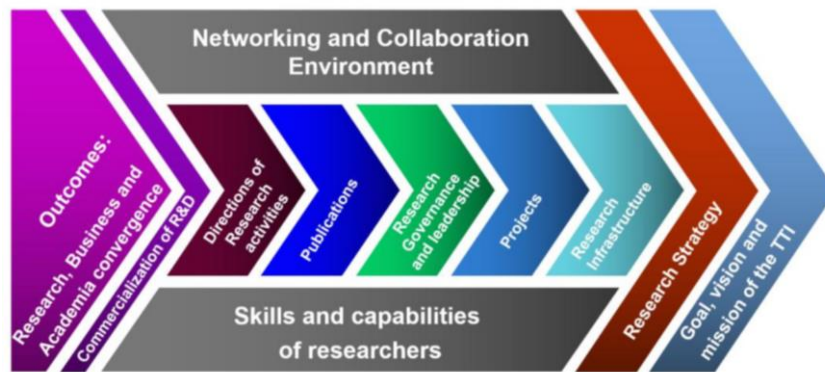


Figure 1. Framework for development of the research program of TSI

1.2. Research Infrastructure

The TSI research infrastructure managerial and policy-making institutions are the Board, rector, vice-rector for science and development. The advisory and supportive functions are delegated to the three Councils: Professorship, Promotion, Doctoral Studies and Research. The primary external advisory body for the research in the Institute is the International Scientific Advisory Board: Prof. Dr. Nicos Komninos (Greece), Univ.-Prof. Dr.-Ing. habil. Prof. E. h. Dr. h. c. mult. Michael Schenk (Germany) and Prof. Dr. Andres Monzon De Caceres (Spain). Their role is to review research activities, provide insights for the key developments and events, provide advice on the challenges, propose funding opportunities and act as ambassadors for the Institute.

Policy implementation functions are given to the Research and Development Department - a structural unit of the Transport and Telecommunication Institute, which main tasks are to promote the efficient use of scientific potential, monitor the needs of the market, create the environment for

	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

continuous partnerships with the industry, expand international scientific and technological cooperation, commercialization, managing and assisting with national, European and international projects, organize conferences and other academic and non-academic events, publish scientific journals, keep records and report on research and innovation activities of the Institute. The TSI Research Department is a focal point entity responsible for the research infrastructure of the Institute.

All 17 laboratories of the TSI work in close collaboration with the management and research and development department. The umbrella institution for eleven laboratories is the Centre of Telecommunications, Electronics and Robotics, which had been founded in 2013 as part of the IKAR (“Information and communication technologies as a single academic resource in the Transport and Telecommunications Institute”) project financed by ERDF (European Regional Development Fund).

The Figure 2 below presents a schematic structure of the research & development infrastructure of the Institute:

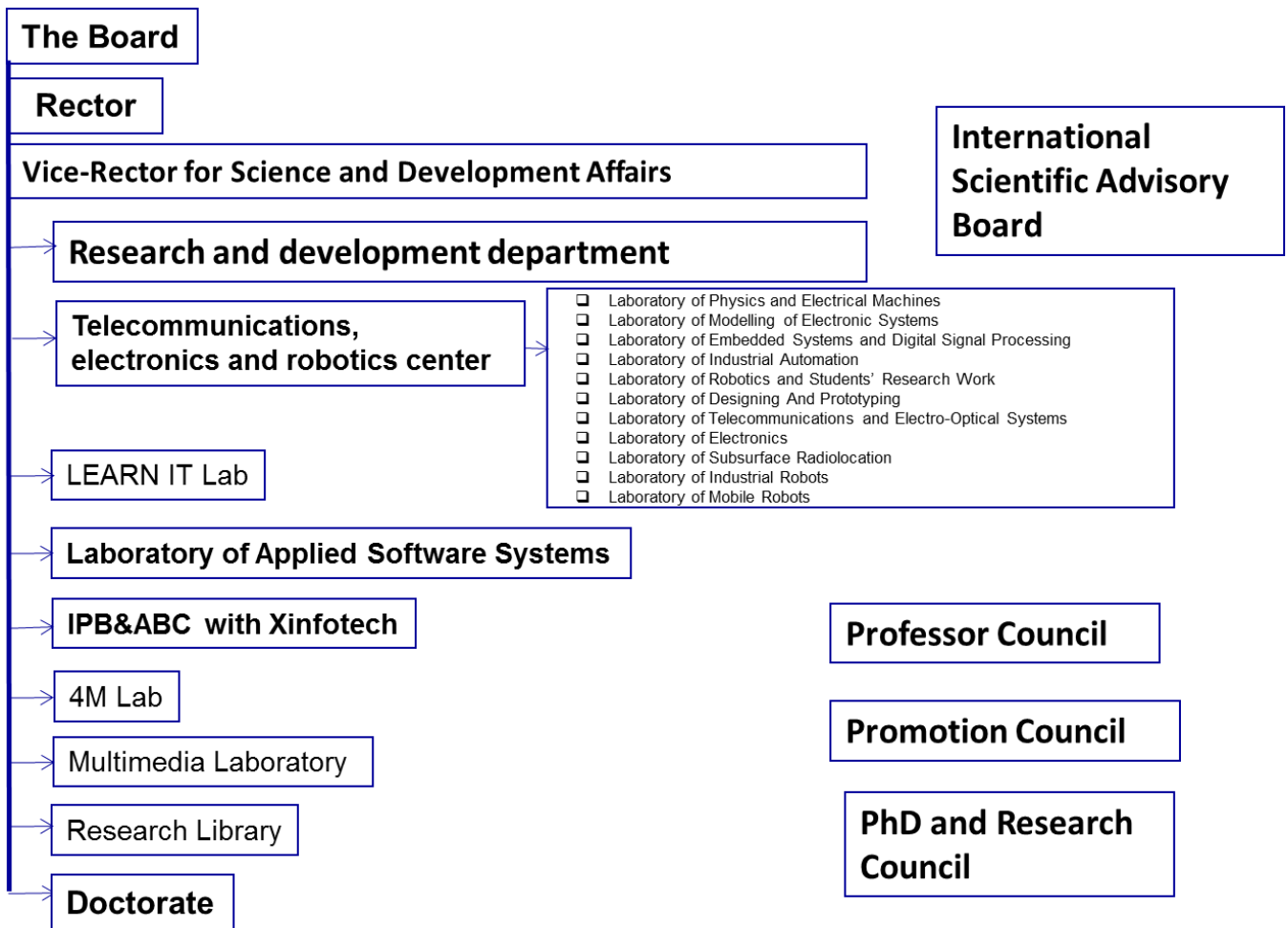


Figure 2. Research Infrastructure

	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

The two new laboratories had been opened in the framework of the Centre in 2018 - Laboratory of Industrial Robots and Laboratory of Mobile Robots. They were opened within the framework of the project No. 8.1.1.0/17/I/009 "Modernisation of Transport and Telecommunications institute STEM study programmes":

Laboratory of Industrial Robots

The laboratory is equipped with 4 industrial robots: the KUKA KR16 robot, the ABB IRB6600 robot, and two KUKA KR125 robots. The laboratory has a functioning segment of an automated production conveyor line, which includes sensors, actuators and control systems based on programmable logic controllers. The laboratory is intended to study the principles of design, operation and use of industrial robots in order to acquire the ability to program industrial robots to perform typical technological operations of robotic production.

Laboratory of Mobile Robots

Within the STEM project additional robotic arm setup consisting of "Universal Robots U3" (with gripper tool and camera) was added to the equipment of TSI in 2018 to provide learning opportunities for students to practise applied programming for industrial processes. Within the same project laboratory additionally was equipped with robots of the following brands: NAO 6 humanoid robots (6 pcs.), Khepera IV compact mobile robots (8 pcs.), Koala 2.5 mobile robots (3 pcs.). The personal computers of the laboratory have the software necessary for programming these robots. The laboratory is intended to study the principles of programming mobile robots, to implement and study existing and developed robot control algorithms: environment mapping algorithms, route planning and navigation algorithms, object detection and recognition algorithms, remote algorithms, artificial intelligence algorithms, etc.). Laboratory robots and software allow to learn the principles of creating mobile robots, to understand the features of the use of mobile robot information devices and to develop practical skills in the implementation of mobile robot control algorithms.

All laboratories are equipped with the latest software and hardware. They are widely used in academic and research activities of the Institute. Each laboratory is a collection of contemporary technical, software and methodological equipment and materials, which allows conducting classes with students at the edge of innovative research. Apart from the above-mentioned laboratories of Industrial Robots and Mobile Robots, the following laboratories are parts of the Centre:

Laboratory of Physics and Electrical Machines. The laboratory is equipped with training equipment of the company PHYWE, which helps exploring the effect of the fundamental laws of physics. At the same time, the electrical machine equipment from the manufacturer K&H MFG, helps to understand the principles and work of modern electric motors.

Laboratory of Modelling of Electronic Systems. The laboratory is equipped with a wide range of applied software allowing simulation of the work of electric circuits and the designing of printed circuit boards. The list of available programs consists but not limited to: Electronic Design Automation package OrCAD; Functional Modelling (Simulation) System Proteus VSM; Modelling

	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

(Simulation) System of Industrial Standard NI Multisim; Graphical Programming System NI LabVIEW; Designing System for Microcontrollers AVR Studio; Designing System for PLIC (programmable logic integrated circuits) Xilinx ISE WebPACK.

Laboratory of Embedded Systems and Digital Signal Processing. The laboratory is equipped with special debug kits with modern microcontrollers such as AVR, Freescale, STMicroelectronics, as well as programmable logic circuits XILINX. The equipment of laboratory allows designing and exploring digital signal processing systems and intelligent control systems.

Laboratory of Industrial Automation. The laboratory is equipped with Siemens control software systems and models of the production lines. The laboratory is designed for the research of the principles of industrial networks and engineering of the systems of automation based on industrial logic controllers. Industrial manipulator Kawasaki RS03N allows learning the principles of programming of industrial robots and exploring the features of integration of the robotic devices into the automated production lines.

Laboratory of Subsurface Radiolocation. The laboratory is equipped with the ground penetrating radar of the company GSSI and a set of options for the research of the roadbed. There is software RADAN 7, for processing the data of ground penetrating radar, installed in the laboratory. All the equipment of the laboratory allows exploring the methods of non-destructive quality control of road surfaces and carrying out of work to assess the quality of the laying road surfaces and detection of hidden engineering communications.

Laboratory of Robotics and Students' Research Work. The laboratory is equipped with a variety of modern measuring equipment made by the company HAMEG and a set of debug modules for microcontrollers, PLIC and signal processors. Software and hardware platform NI ELVIS II allow carrying out the research of the operation of electronic devices through physical, semi-natural and mathematical simulation. The laboratory contains a set of functional units of the robots from LEGO, Lynxmotion, Pololu and Parallax, which allows to create autonomous mobile robots and learn the principles of the construction of control systems of robotic facilities in the laboratory.

Laboratory of Designing and Prototyping. The laboratory is equipped with software and hardware of production the prototypes of the electronic devices, including CNC machine tool LPKF Protomat S63 to produce double-sided printed circuit boards. Soldering Equipment of the laboratory allows to carry out montage using PTH (Pin Through Hole) and SMT (Surface Mount Technology) technologies.

Laboratory of Telecommunications and Electro-Optical Systems. The laboratory is intended for students to explore the principles of the construction of telecommunications equipment: Global System for Mobile communications (GSM); Global Positioning System (GPS); Radio-Frequency Identification System (RFID); Optoelectronic Systems; Digital Telephone Networks; Radio Transmitting and Receiving Devices; Antenna-Feeder Devices.

	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

Laboratory of Electronics. This laboratory is equipped with type setting fields for creating electrical circuits. All the research work is with the use of specialized laboratory measuring equipment.

Aside the Robotics Centre, six other laboratories function as part of the Transport and Telecommunication Institute. These six laboratories listed below encourage students engage in high-quality innovative research in the fields of IT, Digital Economy and Telematics:

Laboratory of Applied Software Systems of the Transport and Telecommunication Institute carries on research and offers consulting in the following fields: traffic, logistics and business processes. The research and analysis are fulfilled using nowadays simulation software. The software of the laboratory allows to do the high-quality, representative and many-sided analysis of the research systems. Such projects as the projects connected with the new bus station in Riga, three level flyover of South bridge model, Liepaja city traffic macroscopic model can be mentioned as a vivid example (see more on website las.tsi.lv).

Multimedia Laboratory. The laboratory is equipped with video-recording and editing equipment complex, which allows creating educational, informative and commercial videos. The filming process of video lectures for the purposes of distance studying, sound recording for video materials and their preparation for placing into e-studying environment takes place at the filming studio. Moreover, the conference presentations and lectures of the lecturers and guest lecturers are being broadcasted live on the internet.

Cisco Networking Academy. Cisco Networking Academy (CNA) Program developed by the specialists of Cisco Systems Company is the most fundamental and methodically worked over among other similar programs in the area of network technologies. Annually over 500 000 students use it in their learning in more than 8000 academies in 164 countries of the world. Only 29 countries do not have networking academies. The purpose of the program is the fundamental training of specialists of planning theory and practice, construction and technical maintenance of local and global networks with the use of generally recognized standards and solutions.

Learn_IT Project Laboratory. The main goal of this Laboratory would be to test a set of tools that will help to increase the effectiveness of learning by supporting the high level of concentration in a manner adapted to the individualized rhythm of learning. The solutions offered under the framework of LEARN IT project may be a good alternative for traditional ways of stimulation of concentration and focus during the process of learning. The Learning Lab with software for mobile devices was developed so that it can be used to prepare personalized recommendations for each person who will be tested in this Laboratory.

4M Laboratory, which provides access to the students and staff of TSI to the latest literature and scientific journals. The library has electronic catalogue of all information entities and it is possible to search the necessary information via internet.

	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

IPB & ABC Laboratory - Image Processing, Biometry & Automated Border Control Systems. Since 2017 TSI in cooperation with one of the industries & business leader – company X-InfoTech organized a new modern research laboratory. Analysis and processing of images (the same as - pattern recognition, machine vision, Image Processing, Pattern Recognition, etc.) is a modern trend - scientific direction supporting a huge number of applications related to monitoring objects and territories, medicine, artificial intelligence, security systems.

1.3. Research Journals

Transport and Telecommunication Scientific Journal.

Journal “Transport and Telecommunication” is a peer-reviewed open-access scientific journal, owned by Transport and Telecommunication Institute. This Journal is a source of information and research results in the full scope of transport science: modelling and planning the transport systems, technical means of transport; transport infrastructure, traffic control, intellectual transport system, telematic and also concerns the interdisciplinary questions: transport and the environment, safety in transport, quality and effectiveness of transport, interoperability and intermodality. The journal aims at addressing professionals in transport and telecommunication in different types of positions in the area of industry, research and academic institutions. The Journal is published quarterly in the electronic and printed version.

The papers published in Journal “Transport and Telecommunication” are included in the following scientific databases:

Baidu Scholar; Cabell's Directory; CNKI Scholar (China National Knowledge Infrastructure); CNPIEC – cnpLINKer; Dimensions; DOAJ (Directory of Open Access Journals); EBSCO (relevant databases); EBSCO Discovery Service; Engineering Village; Google Scholar; Inspec; Japan Science and Technology Agency (JST); J-Gate; JournalGuide; JournalTOCs; KESLI-NDSL (Korean National Discovery for Science Leaders); Microsoft Academic; Naviga (Softweco); Primo Central (ExLibris); ProQuest (relevant databases); Publons; QOAM (Quality Open Access Market); ReadCube; Reaxys; Referativnyi Zhurnal (VINITI); SCImago (SJR); SCOPUS; Sherpa/RoMEO; Summon (Serials Solutions/ProQuest); TDNet; TEMA Technik und Management; Ulrich's Periodicals Directory/ulrichsweb; WanFang Data; Web of Science - Emerging Sources Citation Index; WorldCat (OCLC).

The Figures below demonstrated the development process of the journal. The data are obtained from the Scimago Journal & Country Ranks (<http://www.scimagojr.com/>):

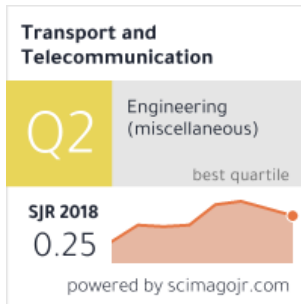


Figure 3 Transport and Telecommunication Journal performance (Scimago)

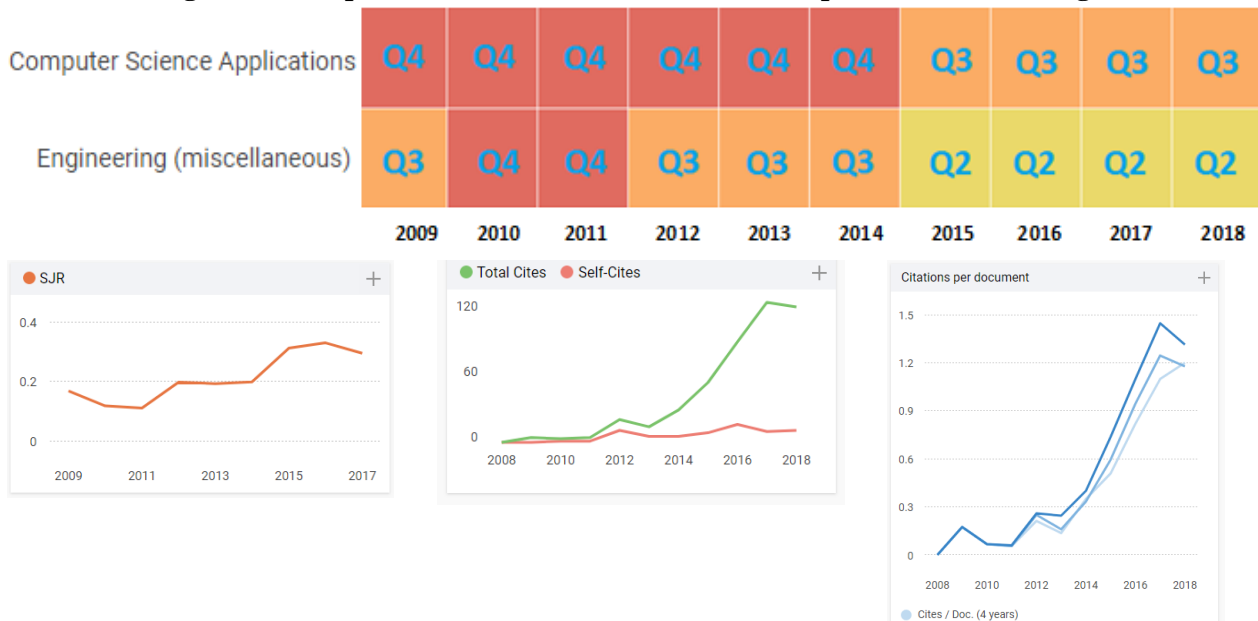


Figure 4 Transport and Telecommunication Journal performance (Scimago) (2)

The significant improving in journal position based on the KPI values included in following Table: (Table 1).

Journal position based on the KPI

KPI	2018 ¹
H-index of the Transport and Telecommunication Journal	10
SJR indicator	0.251
Cites per document (3 years)	1.177
International Collaboration	51.61%
Change the quality of the journal in following categories ² :	
• Computer Science application	Q3
• Engineering (Miscellaneous)	Q2

¹ Based on data from SCImago Journal & Country Rank <http://www.scimagojr.com/> (data available for the year 2017)

² Based on data from SCImago Journal & Country Rank <http://www.scimagojr.com/> (data available for the year 2017)

	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

Aside from “Transport and Telecommunication” journal, the TSI publishes a scientific peer-reviewed journal “**Computer Modelling and New Technologies**”, which is also a quarterly scientific & research journal, ISSN 1407-5806, ISSN 1407-5814.

1.4. Research Staff

The research staff of TSI is registered in VIAA (State Education Development Agency Republic of Latvia) research staff database.

Figures 5 and 6 show the dynamics regarding research staff in TSI starting from 2014:

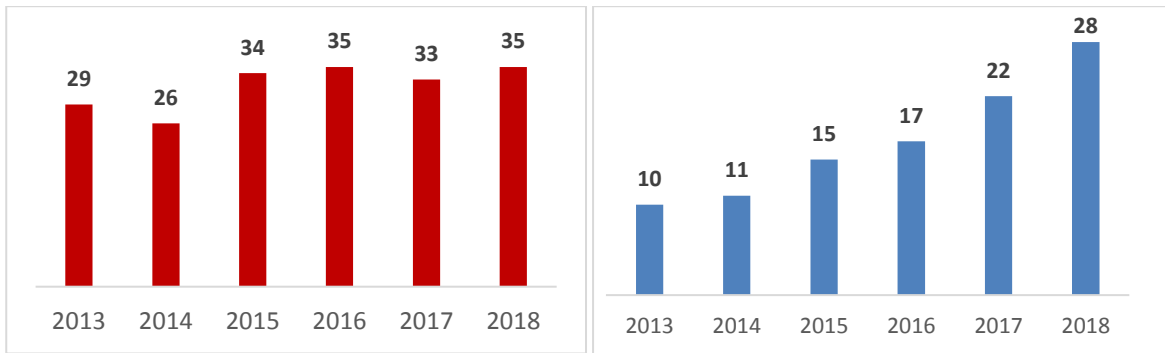


Figure 5. Research staff in the TSI

Figure 6. Research staff (FTE) at the TSI

Figure 7 shows the distribution of staff by type at the TSI:

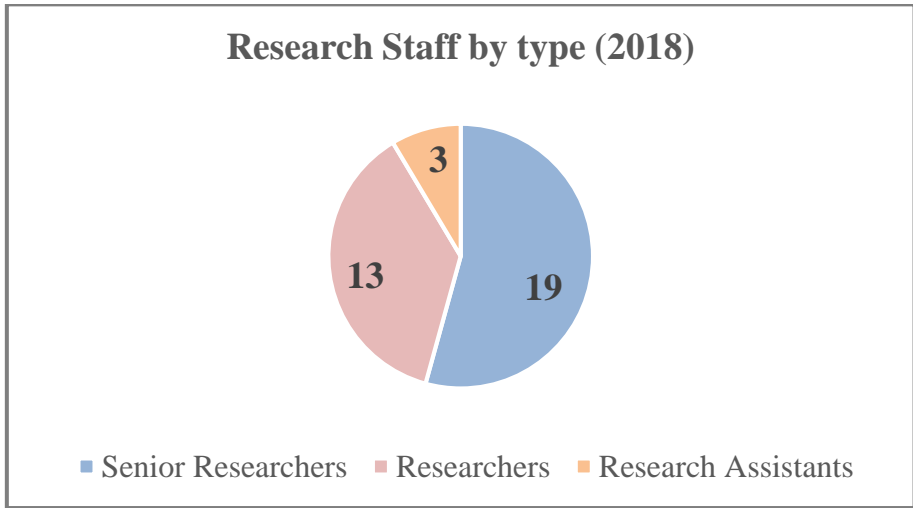


Figure 7. Research staff by type

	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

2. RESEARCH OUTPUT

2.1. Number of scientific publications and other outputs

Scientific publication / outputs, 2018

Table 2

1. Original articles in anonymously refereed scientific journals cited in Web of Science & SCOPUS	51
2. Articles in other refereed scientific edited journals and conference proceedings	32
3. Monographs published³	3
4. Other scientific publications - proceedings⁴	6
5. Text books and other research-related publications	2
6. Patents/ including international	-
7. Computer programs and algorithms⁵	-
8. Registered cultivars	-
9. Conference abstracts	49
10. Visiting lectures	4
11. Articles, radio and television programs and journals popularizing science	1
12. Other⁶	3

Figure 6 shows publication statistics for the last five years:

³ Includes doctoral theses and monographs.

⁴ Includes edited proceedings, collections and special issues of scientific journals, and unrefereed scientific articles, excluding conference abstracts, chapters in books.

⁵ Approximates the number of programs and algorithms that have been in use outside the unit.

⁶ May include design products, prototypes, artefacts, exhibitions, performances etc.

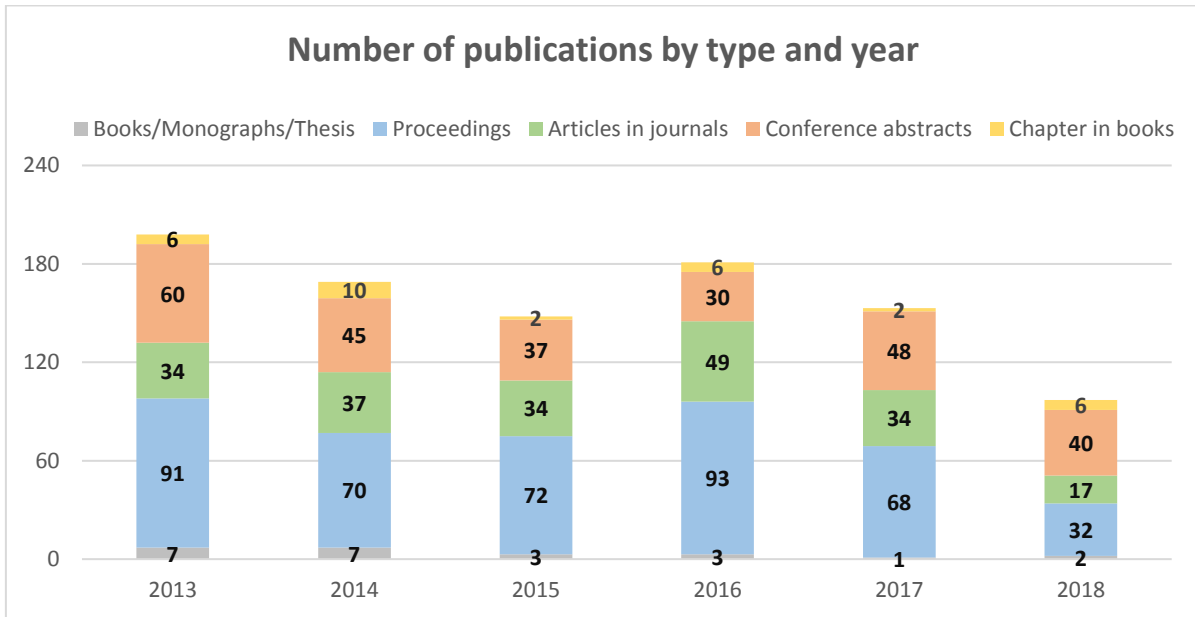


Figure 8. Publication performance and dynamics

2.2. Lists of most important publications by academic personnel and researchers with doctoral degree

- 1) Alomar I., J. Tolujev, D. Weigert and A. Rettmann. "Shortening the turnaround times of aircraft by improving ground handling processes through a simulation study", IEEE Xplore, June, 2018, pp. 1-8.
- 2) Alomar I., Tolujev J., Medvedevs A. Analysis of Riga International Airport Flight Delays. In: Kabashkin I., Yatskiv I., Prentkovskis O. (eds) Reliability and Statistics in Transportation and Communication. RelStat 2017. Lecture Notes in Networks and Systems, vol 36. Springer, pp. 519-529. DOI.org/10.1007/978-3-319-74454-4_50, (Scopus)
- 3) Ishmuhametov, I. (2018) Customer Satisfaction with Banking Services and Its Estimation. In book: "Reliability and Statistics in Transportation and Communication" (I. Kabashkin, I. Yatskiv and O. Prentkovskis eds.) Springer, Cham. pp. 585-596. **Scopus**.
- 4) Jackson I., J. Tolujev and T. Reggelin. "The Combination of Discrete-Event Simulation and Genetic Algorithm for Solving the Stochastic Multi-Product Inventory Optimization Problem", Transport and Telecommunication, Vol. 19. 2018, pp. 233–243.
- 5) Karakikes, W. Hofmann, L. Mitropoulos and M. Savrasov. "Evaluation of Freight Measures by Integrating Simulation Tools: The Case of Volos Port, Greece", Transport and Telecommunication, Vol. 19, June, 2018, pp. 224–232.
- 6) Krivchenkov A., A. Krainyukov and R. Saltanovs. "Effective Wireless Communications for V2G Applications and Objects in Motion", In: Kabashkin I., Yatskiv I., Prentkovskis O. (eds) Reliability and Statistics in Transportation and Communication. RelStat 2017. Lecture Notes in Networks and Systems, vol 36. Springer, Cham, Vol. vol 36., 24 January 2018, 2018, pp. pp 360-370.
- 7) Krivchenkov I. "Model of Wireless Data Network in GPSS Language", Kabashkin I., Yatskiv I., Prentkovskis O. (eds) Reliability and Statistics in Transportation and Communication. RelStat 2017. Lecture Notes in Networks and Systems. Springer, Cham, Vol. vol 36, 24 January 2018, 2018.
- 8) Kuzmina-Merlino I., Saksonova S. (2018) Socially Responsible Investing and Public Pension Fund Performance in Latvia in: Lecture Notes in Networks and Systems, Volume 36, Springer, pages 597-607. https://link.springer.com/chapter/10.1007/978-3-319-74454-4_57
- 9) Kuzmina-Merlino, I., Skorobogatova O., Schmidtke N., Behrendt F. (2018) The Financial and Economic Aspects of Transport Infrastructure Development in Latvia, Transport and Telecommunication Journal, The Journal of the Transport and Telecommunication Institute, Volume 19, issue 3, pages 203-212, Available at: <https://www.degruyter.com/view/j/tjt.2018.19.issue-3/tjt-2018-0017/tjt-2018-0017.xml?format=INT>

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

- 10) Kuzmina-Merlino, I., Skorobogatova O., Schmidtke N., Behrendt F. (2018) Mechanism for Investment in the Transport Infrastructure Development in Latvia in: Lecture Notes in Networks and Systems, Volume 36, Springer, pages 507-518. Available at: https://link.springer.com/chapter/10.1007/978-3-319-74454-4_49
- 11) Lancovs D., "Multi - Layered Approach to The UAV Collision Avoidance System", RESEARCH and TECHNOLOGY – STEP into the FUTURE, Vol. 13, 10, 2018, pp. 46-51.
- 12) Misnevs B. and A. Puptsev. "The use of cloud services when teaching in universities natural sciences and humanities", Educational Technology & Society (Russian Edition), Vol. 21, July, 2018, pp. 432-444.
- 13) Nathanail E., G. Adamos, M. Tsami and I. Yatskiv. "Green Urban Interchanges: Stakeholder and User Perspectives", Transport and Telecommunication, Vol. 19. 2018, pp. 183–193.
- 14) Popova, Y, Popovs, S. (2018). Использование сложных нестандартных заданий в высшей школе. Eastern European Group of International Forum "Educational Technologies and Society», Казанский национальный исследовательский технологический институт, Vol.21, No.3, стр. 386–396 <https://elibrary.ru/contents.asp?titleid=6163> (РИНЦ)
- 15) Popova, Y, Popovs, S. (2018). Организация работы по выполнению групповых заданий в высшей школе. Eastern European Group of International Forum "Educational Technologies and Society", Казанский национальный исследовательский технологический институт, стр. 397–408 <https://elibrary.ru/contents.asp?titleid=6163> (РИНЦ)
- 16) Pozdnyakova O. and Pozdnyakov A. (2018). Ensuring the Academic Workforce Age Balance as a Personnel Management Tool. In book: "Reliability and Statistics in Transportation and Communication" (I. Kabashkin, I. Yatskiv and O. Prentkovskis eds.) Springer, Cham. pp. 659-669. Scopus.
- 17) Stukalina Y., A. Roskosa and D. Pavlyuk. "Investigating students' migration decisions in the frame of career management in higher education institutions of Latvia", International Journal of Educational Management, Vol. 32. 2018, pp. 416-430.
- 18) Stukalina, Y. (2018). Career Management in a Technical University as an Essential Factor Influencing Its Competitiveness. In book: "Reliability and Statistics in Transportation and Communication" (I. Kabashkin, I. Yatskiv and O. Prentkovskis eds.) Springer, Cham, pp. 639-648. Scopus.
- 19) Stukalina, Y. (2018). International accreditation of study programmes in the context of quality assurance in higher education. Proceedings of the International Scientific Conference New Challenges of Economic and Business Development – 2018: Productivity and Economic Growth, University of Latvia, May 10, 2018 – May 12, 2018, pp. 703-713. WoS.
- 20) Stukalina, Y. (2018). Main standards for internal and external quality assurance in the European Higher Education Area. In: Proceedings of the 10th International Scientific Conference "Business and Management 2018, Vilnius Gediminas Technical University, May 3, 2018 – May 4, 2018, pp. 1-8. WoS.
- 21) Stukalina, Y., Roskosa, A. (2018). Management of a Study Programme in the Context of Quality Assurance in Higher Education. Proceedings of the International Scientific Conference Rural Environment. Education. Personality, Vol.11. Jelgava, Latvia University of Agriculture, 11.-12.05.2018, pp. 118-127. Submitted to WoS.
- 22) Stukalina, Y., Roskosa, A., & Pavlyuk, D. (2018). Investigating students' migration decisions in the frame of career management in higher education institutions of Latvia, International Journal of Educational Management, Vol. 32, pp. 416-430. WoS, Scopus.
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- 24) Tsami M., G. Adamos, E. Nathanail, E. Budilovich and I. Yatskiv. "A Decision Tree Approach for Achieving High Customer Satisfaction at Urban Interchanges", Transport and Telecommunication, Vol. 19. 2018, pp. 194–202.
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 TSI TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

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 TSI TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

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- 15) Popova, Y. 2018 Technological TNCs and MNCs as the Representatives of Post-Industrial Economy in the Global Environment, pp. 211-218 Proceedings of the International Conference Transformation of Regional Economies: Sustainable Development and Competitiveness, pp/ 197-205. ISBN 978-9984-47-155-6
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 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

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 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

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- 25) Pavlyuk D., M. Karatsoli and E. Nathanail. "Exploring the Potential of Social Media Content for Detecting Transport-Related Activities". Abstracts of the 18th International Multi-Conference "RELIABILITY and STATISTICS in TRANSPORTATION and COMMUNICATION" (RelStat'18), 17–20 October 2018. Riga, Latvia. I. Kabashkin and I. Yatskiv eds. 2018. pp. 26-27.
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 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

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	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

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 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

3. MASTER AND DOCTORAL TRAINING / ACTIVITIES

3.1. Number of students

Master and Doctoral degree students

Table 3

Position	2018
Completed their master's degree	46
Enrolled in doctoral studies	4
Active doctoral students	10

3.2. Scope of doctoral program activities

Doctoral Degree Programme "Telematics and Logistics" (51526) is a long-standing successful state-accredited third level higher education programme.

In 2018, 4 new candidates were accepted to the doctoral program of TSI: Diņko A. (supervised by Jackiva I.); Hismutova A. (supervised by Jackiva I.), Zervina O. (supervisor to be determined in 2019) and Mikulko J. (supervisor to be determined in 2019).

In 2018 there were three ongoing post-doc projects (approved in 2017) with the budget total of 133805.88 euro for each of the projects, 5% of the financing coming from the Institute in form of salaries for consultants and infrastructure expenses.

This Postdoc projects are:

1) "Nontraditional regression models in transport modeling" (started 01.10.2017.)

The goal of the project is to develop nontraditional regression models, namely the Markov-modulated regression for analysis and forecasting of traffic flows and adjacent transport tasks in transport modelling and find algorithms for their parameter estimation for big data.

In 2018, Dr. Nadežda Spiridovska participated in following conferences:

- 29th European Conference on Operational Research (Spain)
- 27th Nordic Conference in Mathematical Statistics (Estonia)

2) "Spatiotemporal urban traffic modelling using big data" (started 01.10.2017.)

The goal the project is enhancing of the methodological base of urban traffic flow analysis with responsive multivariate spatiotemporal models and algorithms of their parameter estimation for big data.

In 2018, Dr. Dmitrijs Pavļuks has made visiting research trips to:

- Deusto University (Spain)
- Thessaly University (Greece)

He also participated in following conferences:

- XII World Conference of the Spatial Econometrics Association (SEA) (Austria)
- 29th European Conference on Operation Research (EURO-2018) (Spain)

	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

- 7th Symposium of the European Association for Research in Transportation (hEART 2018) (Greece)

3) „Integrated Model for Energy Generation, Distribution and Management” (started 01.12.2017.)
The main goal of research is to develop country energy mixture model for clean environment and economy development in Latvia and implement a prototype of a novel routed smart grid for energy distribution and management.

In 2018, Dr. Tatjana Endrjukaite has made visiting research trips:
in March 2018 to MDBL, Keio University (Japan), where she has participated in Global Environmental System Leaders Symposium 2018.
in December 2018 to MDBL, Keio University (Japan), where she has participated and presented her project during international seminar on environmental issues.

She has participated in following conferences:
28th European Japanese Conference on Information Modelling and Knowledge Bases 2018 (Latvia).
18th International Conference on Reliability and Statistics in Transportation and Communication RelStat 2018 (Latvia).

In 2018, there were no doctoral degree promotional works defended.

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

4. CONFERENCES AND OTHER SCIENTIFIC EVENTS

TSI continues to hold regularly national and international conferences. The most significant among them is the TSI's Annual International Conference "Reliability and Statistics in Transportation and Communication". In 2018 RelStat-18 Conference was held on 17-20 October 2018. The number of given presentations in 2018 has increased by 28%. A total of 178 authors (increase by 40%) from 18 countries (Algeria, Belarus, Bulgaria, Czech Republic, Estonia, France, Germany, Greece, Hungary, Israel, Japan, Latvia, Lithuania, Poland, Russia, Slovakia, Spain, Ukraine) presented their research.

The Conference Proceedings published in 2018 were published in Springer as well as Indexed in Web of Sciences.

Scope of Conferences

Table 4

CONFERENCES					
Conference	Date	Total participants	Given Presentations	Total Authors	Countries
Annual International Conference "Research and Technology – Step into the Future" (Spring)	26/04/2018	58	41	45	N/A (National)
Annual International Conference "Research and Technology – Step into the Future" (Autumn)	07/12/2018	50	27	30	N/A (National)
International Multidisciplinary Conference "Reliability and Statistics in Transportation and Communication (RelStat-2018)"	18/10/2018- 20/10/2018	106	96	178	Algeria Belarus Bulgaria Czech Republic Estonia France Germany Greece Hungary Israel Japan Latvia Lithuania Poland Russia Slovakia Spain Ukraine

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

Conference	Date	Total participants	Given Presentations	Total Authors	Countries
International scientific and educational conference "Actual problems of education (MIP-2018)	22/03/2018-23/03/2018	64	31	42	N/A (National)

Scope of Workshops and Seminars

Table 5

Workshops and seminars	
Workshop/Seminar	Period
PhD seminar "Sci-Bi: Digitalization in Logistics and Transport". The seminar is organized by Transport and Telecommunication Institute (TSI) and takes place on 16 October 2018 in Riga, Latvia.	16/10/2018
SCI-BI: Digitalization in Logistics and Transport	25/04/2018-26/04/2018
Workshop - General overview of the Big Data and BI executive programme in DEUSTO	23/03/2018
Guest seminar and cooperation discussion: Institute of Electronics & Computer Science and TSI in frame of networking activities	13/04/2018
Workshop in a frame of The 28th International Conference On Information Modelling And Knowledge Bases (EJC 2018)	04/06/2018
Workshop for International Riga Airport in frame of networking activities	23/02/2018
Open research seminar by Dr. Giannis Adamos from University of Thessaly (Greece)	05/04/2018
The discussion on road safety governance in collaboration with the International Transport Forum (ITF)	30/05/2018
Workshop in frame of The 28th International Conference On Information Modelling And Knowledge Bases (EJC 2018)	04/06/2018
2nd summer school "Sustainable Transport Interchanges Program (STIP) - Part II: Public Transport Systems: from research to decision making in frame of the ALLIANCE project	01/07/2018-07/07/2018
The 3rd Open Workshop 'Science-to-Business' "From Data to Business Added Value" (as part of RelStat 2018)	07/12/2018

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

Scope of Courses

Table 6

Courses	
Course	Period
Course "Decision making methodologies" for master and PhD students by Eftihia Nathanail from University of Thessaly (Greece)	03/04/2018-06/04/2018
Course "Data-driven Business Intelligence" by Dr. Enrique Onieva from Deusto University (Spain)	15/10/2018-19/10/2018
Course	Period
The course of lectures Strategic Industry Analysis for the master's degree students studying economics and management, transport and logistics by invited professor Neils Rubens.	14/09/2018-22/09/2018
3 October 2018 in Riga, TSI has organised an international round table "Experience of application of international financial reporting standards in the context of globalization and the current economic situation"	03/10/2018
Jelena Popova's Presentation at the plenary session "Globalisation of Tourism Business: Present and Future" International Scientific-Practical Conference Theory and Practice: Problems and Prospects at Marijampoles University, Faculty of Business and Technology Department of Business and Economics May 8-10, 2018.	08/05/2018-10/05/2018

In compare with 2017, TSI has witnessed an increased participation at the international conferences, workshops and seminars/courses activities in TSI. The KPI above shows the TSI R&D sector progress in communication, cooperation, networking and knowledge sharing/transfer at the international level.

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

5. NATIONAL AND INTERNATIONAL COLLABORATION

5.1. National Collaboration

The table below indicates the most significant activities in collaborations and cooperation with research and academic organizations, enterprises and companies, both at local and international levels. In compare with 2017 annual period, there were more collaborative activities with enterprises, as well as growth in numbers of joint projects and collaboration with research/academic organizations.

Scope of national and international collaboration

Table 7

ORGANIZATION	COLLABORATION
National Research Organizations	Type of collaboration / projects
Institute of electronics and computer science	- Cooperation agreement
ORGANIZATION	COLLABORATION
National Universities	Type of collaboration / projects
Riga Technical University	- Common Project Participation (EduRail); - Participation in Doctoral Review Committee - Joint Robotics Championship organisation
Rēzekne Academy of Technology	- Joint Robotics Championship organisation
University of Latvia	- Joint scientific articles - Participation in “RelStat 18” Programme Committee
Vidzeme University of Applied Sciences (ViA)	- Participation in “RelStat 18” Programme Committee - Collaboration Agreement in scientific and academic activities (Design of Doctoral program, researcher mobility, etc.)
Maritime Academy	- Collaboration Agreement in scientific and academic activities (Design of Doctoral program, researcher mobility, etc.)
BA School of Business and Finance	- Participation in “RelStat 18” Programme Committee
Riga International School of Economics and Business Administration	- Participation in “RelStat 18” Programme Committee
Latvian Agriculture University	- Collaboration Agreement in scientific and academic activities (Design of Doctoral program, researcher mobility, etc.)

 TSI TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

Local Enterprises	Type of collaboration / B2B projects
“Accenture Latvia”	<ul style="list-style-type: none"> - Joint “Java” vocal training development - TSI “Career day” participation - Open lectures at TSI - Joint scientific seminars - Joint event management (e.g. “Action Days”) - Student study visits to Accenture office
“X INFOTECH” Ltd	<ul style="list-style-type: none"> - Strategic partnership - Joint scientific work competition for TSI Students - Development of joint Laboratory IPB & ABC in TSI - Collaborative internship program - TSI “Career day” participation - Scholarships grants for TSI Students - Open lectures at TSI (IT, ICT topics) and student study visits to X Infotech office
Local Enterprises	Type of collaboration / B2B projects
C.T.Co	- Joint event management (guest lectures)
Deloitte Latvia	- Joint event management (Science-to-Business seminar)
Ferrus	- Collaborative applied research

5.2. Scope of National Level Collaboration Projects

Table 8

Project	Type
Non-traditional regression models in transport modelling	National / Postdoc Latvia
Spatiotemporal urban traffic modelling using big data	National / Postdoc Latvia
Integrated Model for Energy Generation, Distribution and Management	National / Postdoc Latvia
Modernisation of Transport and Telecommunication institute STEM study programmes	National / Working Program 8.1.1.
Optimum planning of energy-intensive production process and optimization of electricity consumption depending on changes in the market price "ENERGOSERT"	National / Contractor
"MIRROR" In cooperation: “ENGINEERING” (S7 Group)	Consulting project

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

Project	Type
Traffic flow survey and simulation in the area of K. Valdemara-Bruninieku-Skolas-Stabu streets block area. "MCITY9"	Consulting project
Traffic flow survey for projects: "Austrumu maģistrāles pieslēguma ostai izveidei" and "Zemgales virziena maģistrālais transporta mezglam". Rīgas Domes Satiksmes Departaments	Consulting project
Traffic flow survey and simulation in the area of the Ezermalas and R. Feldman street. Ltd. "UNISEB"	Consulting project
Development of an intellectual computer chat-bot prototype, "CHATBOT"	Consulting project
Airport "Riga" registration and safety control zone infrastructure load modeling at peak hours	Consulting project
"Strengthening the academic staff of the Transport and Telecommunication Institute in the areas of strategic specialization"	National / Nr. 8.2.2.0

5.3. International Level Collaboration Projects

Scope of international collaboration in projects

Table 9

HORIZON 2020	
TYPE OF COLLABORATION	FIELD OF SCIENCE
International Project Enhancing excellence and innovation capacity in sustainable transport interchanges (ALLIANCE) ⁷	Research / education
ERASMUS+ KA2	
TYPE OF COLLABORATION	FIELD OF SCIENCE
Spread your wings (SYW)	Research / education
Digitally supported and virtual study practices for modern logistic systems. "DIGILOG"	Research / education
INTERREG	
TYPE OF COLLABORATION	FIELD OF SCIENCE
Harmonised and Modernised Multidisciplinary Railway Education (EDU-RAIL)	Research / education
Smart Logistics and Freight Villages Initiative (SmartLog)	Research
COST	
TYPE OF COLLABORATION	FIELD OF SCIENCE
Wider Impacts and Scenario Evaluation of Autonomous and Connected Transport	Research / ICT

⁷ The green shading here and below means the project had been successfully finalized in 2018.

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

COST	
TYPE OF COLLABORATION	FIELD OF SCIENCE
Project (15221) European Network for Research Evaluation in the Social Sciences and the Humanities (ENRESSH)	Social Sciences and Humanities
Project TU1305 Social networks and travel behavior	ICT / social
Project 15221 Advancing effective institutional models towards cohesive teaching, learning, research and writing development	Research / education
Project TU1408 Air Transport and Regional Development (ATARD)	Air Transport
Project TU1306: Fostering knowledge about the relationship between Information and Communication Technologies and Public Spaces supported by strategies to improve their use and attractiveness (CYBERPARKS)	ICT
ESF	
Strengthening Transport and Telecommunication Institute Academic Staff in the Areas of Strategic Specialisation (STSIAS)	Research / education
OTHER	
Sci-Bi: Digitalization in Logistics and Transport Supervisor: Prof. Irina Jackiva (Yatskiv) Period: 01.04.2018 – 31.10.2018 Programme	Research

5.4. Most Important Foreign Collaborators

Scope of important foreign collaboration

Table 10

Organization	Type of collaboration	Country
Academic organizations	Cooperation	
University of Deusto	Scientific and academic activities (visits)	Spain
Tallinn University of Technology (TUT)	- Collaboration Agreement in scientific and academic activities - Joint Project collaboration (EDU-RAIL, SmartLog)	Estonia
University of Zilina	Researcher and academic mobility	Slovakia
The University of Thessaly, Greece	- Collaboration Agreement in scientific and academic activities (Design of Doctoral program, researchers' mobility in EU Project Horizon-2020, etc.) - Joint participation in H2020 Project Alliance - Double supervision for PhD student approbation - Joint Summer School in Riga for PhD and MS students - Finalizing Alliance Conference - Transport and Telecommunication Journal Board membership, reviewing	Greece

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

Academic organizations	Cooperation	
Regional Open Social Science University, Yoshkar-Ola	Organizing committee of the International scientific-practical conference	Russia
VSEI of Lublin	Researcher and academic mobility	Poland
Vilnius Gediminas Technical University (VGTU)	Conference/Workshop Mutual Participation	Lithuania
University POLITEHNICA of Bucharest	Knowledge Alliance in Air Transport Project	Romania
Margad University of Mongolia	Researcher and academic mobility	Mongolia
Samara State Technical University, Samara	Organizing committee of the International scientific-practical conference	Russia
Kyiv National Economic University named after Vadym Hetman; department of Strategic Management	Organizing committee of the International scientific practical conference	Ukraine
Research Institutes	Cooperation	
Fraunhofer-gesellschaft zur foerderung der angewandten forschung e.v.	<ul style="list-style-type: none"> - Collaboration in scientific and academic activities (Design of Doctoral program, researchers' mobility in EU Project Horizon2020, - Common participation in H2020 Project ("Alliance") - PhD workshop in Magdeburg, participation of students 	Germany
Bulgarian Association for Management Development and Entrepreneurship	Research mobility	Bulgaria
Baltic-German University Liaison Office	<ul style="list-style-type: none"> - Joint workshops and seminars - Sci-Bi: Digitalization in Logistics and Transport Project 	Germany
Enterprises	Cooperation	
Training Center "Aviator"	<ul style="list-style-type: none"> - Collaborative project 	Russia

	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

5.5. Important Scientific Cooperation Events

Second Summer School in the framework of the ALLIANCE Project

Summer School (Alliance): Sustainable Transport Interchanges Program (STIP) - Part II: Public Transport Systems: from research to decision-making, 01/07/2018 - 07/07/2018

Transport and Telecommunication Institute (TSI), Traffic, Transportation and Logistics Laboratory of the University of Thessaly (TTLog) and Fraunhofer Institute for Factory Operation and Automation (IFF) organize the 2nd ALLIANCE Summer School “Sustainable Transport Interchanges Program (STIP) – Part II: Public Transport Systems: from research to decision making”, which will be held on 1-7July, 2018, in Riga, Latvia.

The topics covered in ALLIANCE 2nd Summer School focus on Public Transport Systems. The offered courses were:

- The European policy on intermodal transportation
- Building business models for intermodal transport interchanges
- Sustainable development and transportation planning for passengers
- Operation and management of intermodal transport systems: passenger interchanges
- Optimization of intermodal transport systems
- Intelligent services for passenger transportation
- Design of passenger transport interchanges
- Decision making methodologies
- Data collection methods: Travel surveys
- Data collection methods: Historical and observed data: passenger transport
- Research methodology and teamwork setup

Course "Decision making methodologies" for master and PhD students by Eftihia Nathanail from University of Thessaly (Greece)

From 3 till 6 April 2018 Professor Eftihia Nathanail from University of Thessaly, (Greece) will conduct a course "Decision making methodologies" for master and PHD students in Transport and Telecommunication institute (TSI).

Course topics:

- An Introduction to decision-making: background, techniques, concerns
- Monetary-based techniques (cost-effectiveness and cost-benefit analyses (CBA))
- Multi-stakeholder multi-criteria analysis (Delphi, weighing, normalisation, Analytical Hierarchy Process)
- Multiattribute Utility Theory

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

- Outranking methods (Electre, TOPSIS, Promethee)
- Multi objective mathematical programming
- Decision making in project management (transportation and logistics projects)

5.6. Non-academic collaborations

Non-academic collaboration

Table 11

Name and Organisation	Type of collaboration	Country
Latvian Electrical Engineering and Electronics Industry Association (LETERA)	Membership, joint research	Latvia
International Airport "Riga"	Professional Master's in Aviation Management	Latvia
Latvian Information and Communications Technology Association (LIKTA)	Membership, joint research	Latvia
Informatics Europe	Membership, information exchange	Switzerland
European Conference of Transport Research Institutes (ECTRI)	Membership, information exchange, reviewing	EU
RAF-AVIA	Professional Master's in Aviation Management	Latvia
Association Latvijas Auto	Consultation	Latvia
Latvian Association of Remotely Piloted Aircraft Systems	Membership, Co-founder, Consultation, Projects.	Latvia
Latvian Aviation Association	Membership	Latvia
Scientific Training Consultation Center of Transport and Logistics (ZMKTLC)	Consultation	Latvia
Association of Paneuropa Coach Terminals	Member of Expert Board	Germany
Ltd. LEO Research Centre	Membership invited lectures, joint projects	Latvia
Ltd. "WING 4 SKY GROUP"	Professional Master's in Aviation Management	Latvia
ECTRI	Irina Jackiva is a Vice President of the association	Belgium
Ltd. "Airline Support Baltic"	Professional Master's in Aviation Management	Latvia

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

6. MEMBERSHIPS IN BOARDS (JOURNALS, CONFERENCES, ASSOCIATIONS)

TSI research and academic staff continue actively participation in the various scientific committees of conferences, as well as in editorial boards of scientific journals, which is very important for continuously growth of expertise area and advanced knowledge sharing.

Table 12

Name	Journal
Igor Kabashkin	<ul style="list-style-type: none"> - Computer Modelling and New Technologies (ISSN 1407-5806), Latvia - Transport and Telecommunication (ISSN 1407-6160), Latvia - Journal of Air Transportation (ISSN 1093- 8826), USA, University of Nebraska at Omaha - Transport (ISSN 1392-1533), Lithuania, Lithuanian Academy of Science - Technological and Economic Development (ISSN 1392- 8619), Lithuania, Vilnius Gediminas Technical University - Aviation” (ISSN 1392-1534), Lithuania, Vilnius Gediminas Technical University - Journal “Transactions on Transport Sciences” (ISSN 1802-971X), Czech Republic, Ministry of Transport - Sustainable Spatial Development” (ISSN 1691-6174), Riga Technical University - Journal of Aviation Technology and Engineering” (ISSN 2159-6670), published by Purdue University Press, USA - Baltic Journal of Modern Computing (ISSN 2255-8950 electronic; ISSN 2255-8942 paperback), Estonia-Latvia-Lithuania
Irina Yatskiv	<ul style="list-style-type: none"> - Transport and Telecommunication (ISSN 1407-6160), Latvia - Mathematics in Engineering, Science and Aerospace (ISSN 2041-3165) - Maintenance and Reliability, Polish Maintenance Society (Warsaw) - Transport (ISSN 1392-1533), Lithuania, Lithuanian Academy of Science - Economics of Development, Kharkov National University of Economics - Sustainable Development of Transport and Logistics, Open Access Journal. ISSN 2520-2979
Alexander Grakovski	<ul style="list-style-type: none"> - Transport and Telecommunication (ISSN 1407-6160), Latvia
Juri Tolujew	<ul style="list-style-type: none"> - Transport and Telecommunication (ISSN 1407-6160), Latvia
Alexander Andronov	<ul style="list-style-type: none"> - Automatic Control and Computer Sciences (ISSN 0146-4116), Latvia
Stetjuha Aleksander	<ul style="list-style-type: none"> - Economic Alternatives”, ISSN 1312-7462 University of National and World Economy, Sofia, Bulgaria http://www.unwe.bg/eajournal/en
Kuzmina-Merlino Irina	<ul style="list-style-type: none"> - International Management Journals, United Kingdom, London. ISSN: 1742-528X (on-line Journals), IMJ Editorial Advisory Board http://www.managementjournals.com/editorialteam.htm - The Clute Institute, Journal of Business Case Studies, ISSN 1555-3353 (print);

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

	<p>ISSN 2157-8826 (online) Reviewers' team http://journals.cluteonline.com/index.php/JBCS/about/displayMembership/39</p> <ul style="list-style-type: none"> - Emerald Emerging Markets Case Studies Journal, Reviewer http://www.emeraldgrouppublishing.com/reviewers/index.htm - The University of World Economy, Editorial Board of University Yearbook (research papers), ISSN: 1312-5486 (print); ISSN (on-line) 2534-8949 http://yearbook.unwe.bg - Journal "Forum Scientiae Oeconomia" , Warsaw, Poland (ISSN 2300-5947 - printed, ISSN 2353-4435 - online), reviewer http://www.wsb.edu.pl/reviewers,m,f,2039
Aleksandr Medvedev	<ul style="list-style-type: none"> - Journal of Traffic and Transportation Engineering. David Publishing Company. New York, USA – editorial board member - Interstate aviation committee member of Coordinating Council
George Utekhin	<ul style="list-style-type: none"> - Lublin Higher School of Economics and Innovation (WSEI) – editorial board member
Užule, K	<ul style="list-style-type: none"> - Scientific Journal of the Siberian Federal University (Russia) "Gumanitarnije nauki", ISSN 2587-6066, http://journal.sfu-kras.ru/series/humanities/editorial-board
Boriss Misnevs	<ul style="list-style-type: none"> - International Journal on Information Technologies and Security Special Issue № SP1/2017 ISSN 1313-8251 Indexed in ESCI of Thomson Reuters, co-editor - Journal of Educational and Instructional Studies in the World – WJEIS – ISSN: 2146 – 7463. - http://www.wjeis.org/?pnun=6&pt=Editorial%20Board - International Women OnLine Journal on Distance Education - WOJDE, ISSN: 2147-0367) - http://www.wojde.org/?pnun=5&pt=Editorial%20Board

6.1. Memberships in Program and Organization Committee of Scientific Conferences

TSI staff memberships in Programme and Organization Committees of scientific conferences

Table 13

Name	Memberships
Igor Kabashkin	<ul style="list-style-type: none"> - Programme and Organization Committee of the International Conference “Reliability and Statistics in Transport and Communication”, (RelStat), Riga, Latvia - Programme Committee of the International Conference “European-Asian Transport Corridors: Trends. Strategies. Practices” - Transport Means 2018 - Programme and Organization Committee of the Conference “Research and Technology – step to the future, Riga, Latvia - Programme Committee of the Conference “Actual Problems of Education”, Riga, Latvia

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

Name	Memberships
Irina Yatskiv	<ul style="list-style-type: none"> - Programme and Organization Committee of the International Conference “Reliability and Statistics in Transport and Communication”, (RelStat), Riga, Latvia - Programme Committee of the International Conference on Dependability and Complex Systems (DepCoS-RELCOMEX), Wroslaw, Poland - Programme and Organization Committee of the Conference “Research and Technology – step to the future, Riga, Latvia. - Programme Committee of the Conference “Actual Problems of Education”, Riga, Latvia
Alexander Grakovski	<ul style="list-style-type: none"> - Programme Committee of the International Conference “Reliability and Statistics in Transport and Communication”, (RelStat), Riga, Latvia - Programme and Organization Committee of the Conference “Research and Technology – step to the future, Riga, Latvia. - Programme Committee of the Conference “Actual Problems of Education”, Riga, Latvia
Juri Tolujew	<ul style="list-style-type: none"> - Programme and Organization Committee of the International Conference “Reliability and Statistics in Transport and Communication”, (RelStat), Riga, Latvia.
Boriss Mishnevs	<ul style="list-style-type: none"> - Programme and Organization Committee of the Conference “Research and Technology – step to the future, Riga, Latvia. - Programme Committee of the Conference “Actual Problems of Education”, Riga, Latvia - International Congress on Education, Distance Education and Educational Technology- ICDET, Antalya- Turkiye
Irina Kuzmina-Merlino	<ul style="list-style-type: none"> - The Clute Institute, Journal of Business Case Studies, Reviewers’ team. http://journals.cluteonline.com/index.php/JBCS/about/displayMembership/39 - The University of World Economy, Editorial Board of University Yearbook (research papers), ISSN: 1312-5486 (print); ISSN (on-line) 2534-8949 http://yearbook.unwe.bg - Yaroslavl State University named after Demidov, Journal “Social and Human Knowledge”, ISSN 2412-6519 http://www.uniyar.ac.ru/science/scientific-journals/series-the-humanities/editorial-staff/ - Journal "Forum Scientiae Oeconomia" , Warsaw, Poland (ISSN 2300-5947 - printed, ISSN 2353-4435 - online), reviewer

	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

	<ul style="list-style-type: none"> - Emerald's Emerging Markets Case Studies (EMCS). Editorial Advisory Board, Available at: http://www.emeraldgrouppublishing.com/products/case_studies/eab.htm. - Journal of Business Case Studies, The Clute Institute, Reviewers' team. http://journals.cluteonline.com/index.php/JBCS/about/displayMembership/39 - The University of World Economy, Editorial Board of University Yearbook (research papers), ISSN: 1312-5486 (print); ISSN (on-line) 2534-8949 http://yearbook.unwe.bg - Journal "Social and Human Knowledge", Yaroslavl State University named after Demidov, ISSN 2412-6519 http://www.uniyar.ac.ru/science/scientific-journals/series-the-humanities/editorial-staff/ - International Strategic Management Conference, Prague July 12-14, 2018 Peer-Review Committee.
Aleksandr Medvedev	<ul style="list-style-type: none"> - Programme Committee of the Conference "Research and technology – step into the future", TSI Research and academic conference. - Inter- higher school scientific and educational conference "Actual problems of education" (TTI) – programme committee member
Georgs Utehins	<ul style="list-style-type: none"> - Programme and Organization Committee of the Conference "Research and Technology – step to the future, Riga, Latvia - Programme Committee of the Conference "Actual Problems of Education", Riga, Latvia - Lublin Higher School of Economics and Innovation (WSEI) – editorial board member, "Transportation systems and Information Technology"
Mihails Savrasovs	<ul style="list-style-type: none"> - Programme and Organization Committee of the International Conference "Reliability and Statistics in Transport and Communication", (RelStat), Riga, Latvia - Scientific Committee of the International Conference on Sustainable Urban Mobility, Volos, Greece
Dmitry Pavlyuk	<ul style="list-style-type: none"> - Programme and Organization Committee of the International Conference "Reliability and Statistics in Transport and Communication", (RelStat), Riga, Latvia

 TSI TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

Ishmuhametov Ishgaley	<ul style="list-style-type: none"> - Member of the Programme Committee of the Conference “Actual Problems of Education”, Riga, Latvia - Member of the Programme and Organization Committee of the Conference “Research and Technology – step to the future, Riga, Latvia - Member of the Programme Committee of the International Conference “Reliability and Statistics in Transport and Communication”, (RelStat), Riga, Latvia - Member of the Programme Committee of the International Scientific and Practical Conference "Psychological Support of Education: the theory and practice". (Joint Conference with the TSI). Yoshkar-Ola: MOSI, Russia. - Member of the Programme Committee of the International Scientific and Practical Conference " Innovative Strategies for the Development of Economics and Management” (Joint Conference with the TSI). Samara State Technical University, Samara, Russia
Palma A.	<ul style="list-style-type: none"> - Member of the Programme Committee of the Conference “Actual Problems of Education”, Riga, Latvia - Member of the Organization Committee of the Conference “Research and Technology – step to the future, Riga, Latvia - Heritage & Tourist Destinations: Creative Approaches in Development - The International Scientific Conference Tourism and Innovations, University of Economics, Varna, Bulgaria. Peer reviewer
Popova J.	<ul style="list-style-type: none"> - International Scientific and Practical Conference Cultural Heritage & Tourist Destinations: Creative Approaches in Development - The International Scientific Conference Tourism and Innovations, University of Economics, Varna, Bulgaria. Peer reviewer
Stejuha A.	<ul style="list-style-type: none"> - Member of the Programme Committee of the Conference “Actual Problems of Education”, Riga, Latvia - Member of the Programme and Organization Committee of the Conference “Research and Technology – step to the future, Riga, Latvia - Member of the International Advisory Board of the Journal “Economic Alternatives”, University of National and World Economy, Sofia, ISSN 1312-7462
Stukalina Y.	<ul style="list-style-type: none"> - Member of the Programme Committee of the Conference “Actual Problems of Education - MIP2018”, Riga, Latvia - Member of the Programme Committee of the International Conference “Reliability and Statistics in Transport and Communication”, (RelStat2018), Riga, Latvia

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

6.2. Prizes Awarded to Researchers, Honors and Scientific Positions of Trust

TSI Staff awarded with prizes and honours in 2018

Table 14

Name	Prize, position etc.
Evelīna Budiloviča	Alliance project research excellence prize

6.3. Memberships in committees and in scientific advisory boards of business companies or other similar tasks of no primarily academic nature

One of the most important outcomes and goals for TSI Research & Development program is support and knowledge sharing for business. R2B connections and communications is supported by participation of TSI Research/Academic Staff in business company's scientific advisory boards.

TSI Staff membership in scientific advisory boards of business companies and associations

Table 15

Name	Tasks
Igor Kabashkin	Scientific supervisor of Latvian Centre of Competence in Transport, Energy and Manufacturing
Irina Yatskiv	External expert in Association of Paneuropean Coach Terminals Member of Board, ECTRI
Alexander Grakovski	Member of Council of expert working group of the electronic communications sector (Latvian Ministry of Transport)
Aleksandr Medvedev	Telemātikas un loģistikas institūts Ltd. – board member Aviation Research Center Ltd. – board member Member of Latvian professorial association of higher schools
Ieva Kozlovska	Member of examination commission of the Latvijas Zvērinātu Revidentu Asociācija

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

7. SUBMITTED PROJECT APPLICATIONS

Submitted Project Applications (2018)

Table 16

No	Application	Type of project/programme	Status
1	Rīgas Dome, моделирование транспортных потоков	Commercial project (tender)	Approved
2	“Digitally supported and virtual study practices for modern logistic systems”	ERASMUS +	Approved
3	TI-18/313. Lidostas “Rīga” reģistrācijas un drošības kontroles zonu infrastruktūras noslodzes modelēšana sastrēguma stundās	Commercial project	Approved
4	Klienta uzvedības modeļa un intelektuālā čatbota izstrādes pakalpojumu nodrošināšanai "CHATBOT"	Commercial project 1.2.1.2. Atbalsts pētniecības rezultātu komercializācijai	Approved
5	MCITY9, моделирование транспортных потоков	Commercial project	Approved
6	Transporta un sakaru institūta akadēmiskā personāla stiprināšana stratēģiskās specializācijas jomās	National project (8.2.2: Stiprināt augstākās izglītības institūciju akadēmisko personālu stratēģiskās specializācijas jomās)	Approved
7	Исследование мобильности, оценка транспортного потока и актуализация имитационной модели "SIMMOB"	Commercial project	Approved
8	Robotic warehouse control system "LOGIDRONE"	Commercial project	In Validation (as of Feb 2019)
9	Riga Airport traffic simulation / modelling "RIX TRAFFIC"	Commercial project	In Validation (as of Feb 2019)
10	“TRAVEL SAFE”	H2020	Not approved

 TRANSPORTA UN SAKARU INSTITŪTS	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

No	Application	Type of project/programme	Status
11	“D-CIDE”	H2020	Not approved
12	“The solution of the inverse problem of radar subsurface sounding of roadway coverage in real-time”	National project (Latvijas Zinātņu padomes 2018. gada fundamentālo un lietišķo pētījumu projektu konkurss)	Not approved
13	Pētījums par datu iegūvi un apstrādi enerģiju plūsmu kontroles un vadības algoritmu un sistēmas prototipa izstrādes vajadzībām	Commercial project 1.2.1.1. “Atbalsts jaunu produktu un tehnoloģiju izstrādei kompetences centru ietvaros”	Not approved
14	“Big data approach for cybercrime investigation”	International Cooperation Project 8 Mutual Funds Taiwan – Latvia – Lithuania Cooperation Project Application Year 2019-2020	Not approved
15	“The solution of the inverse problem of radar subsurface sounding of roadway coverage in real-time”	National project (Latvijas Zinātņu padomes 2018. gada fundamentālo un lietišķo pētījumu projektu konkurss 2.kārta)	Not approved
16	Разработка платформы-ассистента для командной и персональной работы, управления и учёта. "CALENDAYS"	Commercial project “1.1.1.1. „Praktiskas ievirzes pētījumi” 2. Kārta”	Not approved
17	Разработка прототипа бизнес-модели и ИТ-платформы для логистических решений "SMARTCHAIN"	Commercial project “1.1.1.1. „Praktiskas ievirzes pētījumi” 2. Kārta”	Not approved

	RESEARCH AND DEVELOPMENT DEPARTMENT	REPORT (ANNUAL)
		FORM RD89G Revision 0

8. FINANCING OF RESEARCH

2018 TSI R&D Budget

Table 17

Financing	Amount EUR without VAT (21%)
Financing for research work	1 525 556
National budget financing	217 310
Revenues from contract work with another Latvian legal entities	149 346
Foreign financing (financing received from international organizations or international organizations contract basis, payments received from abroad on research activities)	1 132 718
Other funding for scientific work together: References from conferences, seminars, etc.	26 181