



**TRANSPORTA
UN SAKARU
INSTITŪTS**

Scientific Activity Report

2017

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.

CONTENTS

SCIENTIFIC ACTIVITY REPORT	1
LIST OF FIGURES	3
LIST OF TABLES	3
1. GENERAL INFORMATION	4
1.1. MISSION, VISION	4
1.2. RESEARCH INFRASTRUCTURE	5
1.3. RESEARCH JOURNALS AND CONFERENCES	8
1.3. RESEARCH STAFF	10
2. RESEARCH OUTPUT	12
2.1. NUMBER OF SCIENTIFIC PUBLICATIONS AND OTHER OUTPUTS	12
2.2. LISTS OF MOST IMPORTANT PUBLICATIONS BY ACADEMIC PERSONNEL AND RESEARCHERS WITH DOCTORAL DEGREE	12
3. MASTER AND DOCTORAL TRAINING / ACTIVITIES	17
3.1. NUMBER OF STUDENTS	17
3.2. SCOPE OF DOCTORAL PROGRAM ACTIVITIES	17
4. NATIONAL AND INTERNATIONAL COLLABORATION	19
4.1. NATIONAL COLLABORATION	19
4.2. SCOPE OF NATIONAL COOPERATION PROJECTS	20
4.3. INTERNATIONAL COLLABORATION	20
4.5. MOST IMPORTANT FOREIGN COLLABORATORS	23
4.6. MOST IMPORTANT OUTCOMES OF THE VISITS AND COLLABORATION CONTACTS	24
4.7. IMPORTANT SCIENTIFIC COOPERATION EVENTS	26
4.8. INVITED RESEARCHERS IN TTI IN 2017 (SHORT TIME SCIENTIFIC MISSIONS)	26
4.9. NON-ACADEMIC COLLABORATION	28
5. MEMBERSHIPS IN EDITORIAL BOARDS OF SCIENTIFIC JOURNALS	30
5.2. MEMBERSHIPS IN PROGRAMME AND ORGANIZATION COMMITTEE OF SCIENTIFIC CONFERENCES	31
5.3. PRIZES AWARDED TO RESEARCHERS, HONORS AND SCIENTIFIC POSITIONS OF TRUST	34
5.4. MEMBERSHIPS IN COMMITTEES AND IN SCIENTIFIC ADVISORY BOARDS OF BUSINESS COMPANIES OR OTHER SIMILAR TASKS OF NO PRIMARILY ACADEMIC NATURE	34
6. SUBMITTED PROJECTS (INTERNATIONAL/NATIONAL)	35
7. FINANCING FOR RESEARCH WORK	36

LIST OF FIGURES

Figure 1 Framework for development of the research program of TTI.....	4
Figure 2 Research infrastructure.....	5
Figure 3 Transport and Telecommunication Journal performance.....	9
Figure 4 Research staff in the TTI Figure 5 Research staff (FTE) in the TTI.....	11
Figure 6 Distribution of staff in the TTI faculties	11

LIST OF TABLES

Table 1.1 Journal position based on the KPI.....	10
Table 2.1 Scientific publication/outputs, 2017	12
Table 2.2 Patents confirmed in 2017 (hold by TTI)	16
Table 3.1 Master and Doctoral degree students.....	17
Table 3.2 Promotional works for the doctoral degree	18
Table 4.1 Scope of national and international collaboration	19
Table 4.2 Scope of national cooperation projects.....	20
Table 4.3 Scope of international collaboration in projects	20
Table 4.4 Scope of conferences, workshops and seminars.....	21
Table 4.5 Workshops and seminars.....	21
Table 4.6 Courses	22
Table 4.7 Scope of important foreign collaboration.....	23
Table 4.8 Scope of important outcomes and collaboration contacts	24
Table 4.9 Non-academic collaboration.....	29
Table 5.1 TTI staff memberships in editorial boards of scientific journals.....	30
Table 5.2 TTI staff memberships in Programme and Organization Committees of scientific conferences ..	31
Table 5.3 Prizes awarded to researchers, honors and scientific positions of trust.....	34
Table 5.4 TTI Staff membership	34
Table 6.1 Submitted Projects.....	35
Table 7.1 Financing	36

1. GENERAL INFORMATION

1.1. Mission, vision

Mission. The mission of the Transport and Telecommunication Institute (TTI) is adaptive to the needs of society academic and scientific activities at the international market in the interdisciplinary areas based on the fundamental achievements in the sphere of high technologies in the form 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 address fundamental and strategically important questions, and to deliver economic, social and cultural impact at regional, national and international levels. We engage in internationally leading research activities and collaborations.

Our Strategy is informed by the following set of values, by which the University will judge the merits of planning and investment decisions for research:

1. Research excellence contributes significantly to our reputation, both at a national and international level.
2. We engage in high quality research, both basic and applied, to answer fundamental and strategically important questions and to benefit the wider community.
3. Research informs our teaching and we seek to engage students in our research programmes.
4. We value the expertise of our staff and students and are committed to supporting them to reach their full research potential.
5. We are committed to maximizing the income associated with our research and through this providing the sustainable environment needed to enhance our research.

The TTI will:

- support the highest quality research and develop collaborations that enhance the contribution of research to the broad portfolio of our activities;
- support and develop excellent researchers within a sustainable research culture;
- promote and publicize the contributions that our research makes to the advancement of knowledge and to wider economic and societal benefit.



Figure 1 Framework for development of the research program of TTI

1.2. Research infrastructure

The research infrastructure of TTI is coordinated by the Research Department of TTI and it is presented in Figure below.

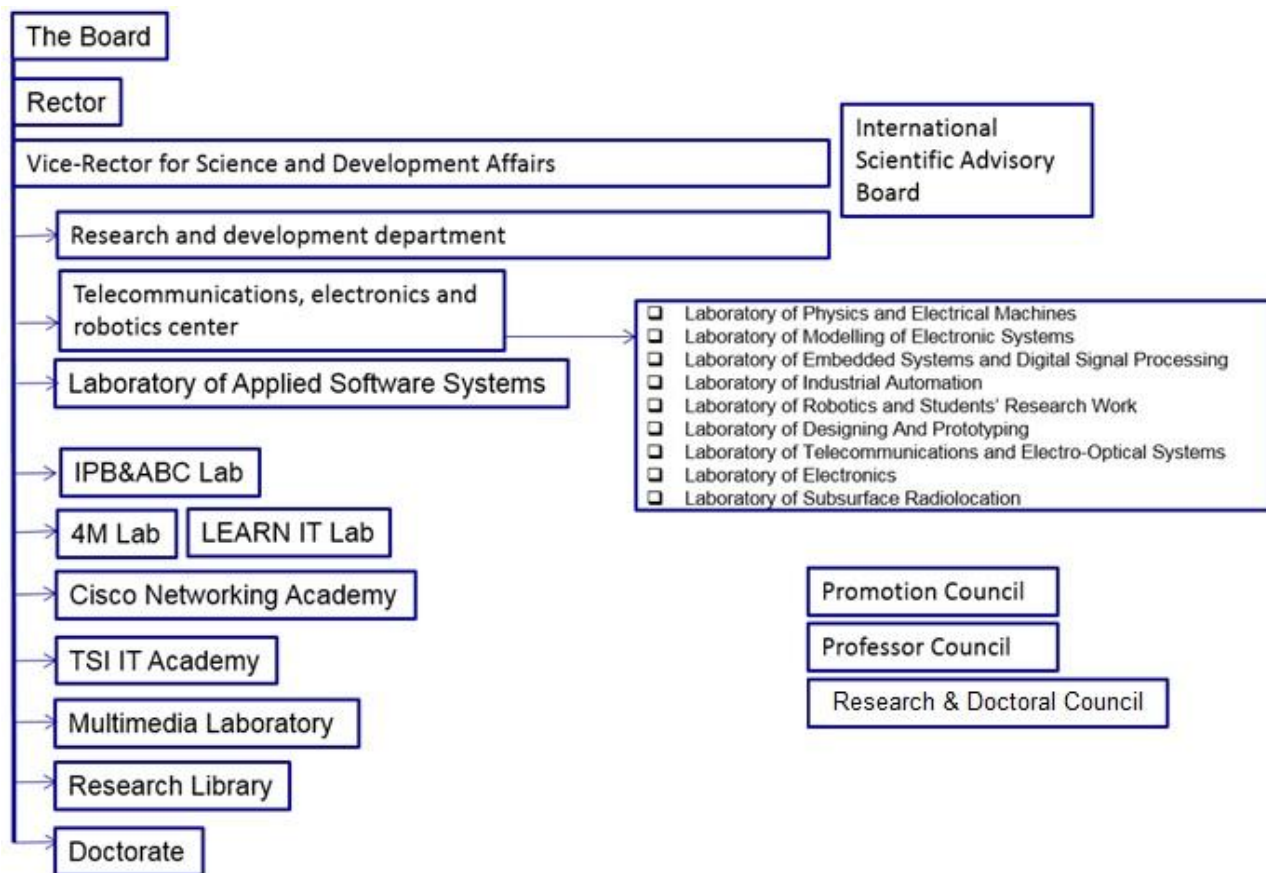


Figure 2 Research infrastructure

The Centre of Telecommunications, Electronics and Robotics was founded in 2013 in the framework of project IKAR with financial support of ERDF. The center includes nine laboratories equipped with the latest software and hardware widely used in academic and research activities. Each laboratory is a collection of contemporary technical, software and methodological maintenance, which allows conducting classes with students at the highest level. The following laboratories were formed and equipped as part of the center:

- a) **Laboratory of Physics and Electrical Machines.** The laboratory is equipped with training equipment of the company PHYWE, which allows students to explore 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.
- b) **Laboratory of Modelling of Electronic Systems.** Computer class with modern software, which allows to execute the simulation of the work of electric circuits and the designing of printed circuit boards. The list of software includes: Electronic Design Automation package OrCAD; Functional Modelling (Simulation) System Proteus VSM; Modelling (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 and others.

- c) **Laboratory of Embedded Systems and Digital Signal Processing.** The laboratory is equipped with special debug kits with modern microcontrollers AVR, Freescale, STMicroelectronics, as well as programmable logic circuits XILINX. The equipment of laboratory allows designing and exploring of digital signal processing systems and intelligent control systems.
- d) **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.
- e) **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.
- f) **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.
- g) **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, for the production of 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.
- h) **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.
- i) **Laboratory of Electronics.** This laboratory is equipped with typesetting fields for creating electrical circuits. All the research work is with the use of specialized laboratory measuring equipment.
- j) **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).

- k) **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.
- l) **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.
- m) **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.
- n) **4M Laboratory,** which provides access to the students and staff of TTI 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.
- o) **IPB & ABC Laboratory** - Image Processing, Biometry & Automated Border Control Systems. Since 2017 TTI in cooperation with one of the industries & business leaders – 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, etc.

The goal of creating a joint laboratory IPB & ABC by TTI and X-InfoTech is to form a new (for TTI) long-term scientific direction and to perform scientific and applied research, development and scientific support of products (in the interest to business and industry).

Laboratory Equipment of the IPB & ABC includes the following equipment:

- a) Full scale model of the automated checkpoint (Electronic Gates);
- b) Signature capturing pad;
- c) Biometric Fingerprint scanner;
- d) Camera;
- e) Document reader;
- f) Microphones.

The tasks of the IPB & ABC laboratory:

- a) Monitoring the state and implementation of scientific and applied research in the field of image analysis and processing, biometric methods of identification of humans, objects, documents, information and protection of such data;
- b) Test developmental design, software solutions and testing of methods and equipment in a complex for Automated Border Control System;
- c) Development of the architecture of the information system of the automated checkpoint and interfaces to include existing information systems, databases and data banks in the system;
- d) Research, development and testing in the field of network and information security of the automated checkpoint system (using Cisco laboratory equipment at TSI);
- e) Scientific support, debugging and modernization of existing and future products (priority - in the interest of the X-InfoTech campaign);
- f) Attracting talented young people from among students and employees to perform research on the profile of the laboratory;
- g) Attraction of European funds in the framework of scientific projects based on the profile of the laboratory;
- h) Incubation of "startups" based on the most successful student projects and solutions.

1.3. Research journals and conferences

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: SCOPUS (since 2008, Vol. 9, No 1), Elsevier Database; Web of Science - Emerging Sources Citation Index;

- Baidu Scholar
- Cabell's Directory
- CNKI Scholar (China National Knowledge Infrastructure)
- CNPIEC
- 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
- Journal Guide
- Journal TOCs
- KESLI-NDSL (Korean National Discovery for Science Leaders)

- Microsoft Academic
- Naviga (Softweco)
- Primo Central (ExLibris)
- ProQuest (relevant databases)
- Publons
- ReadCube
- Reaxys
- Referativnyi Zhurnal (VINITI)
- SCImago (SJR)
- Sherpa/RoMEO
- Summon (Serials Solutions/ProQuest)
- TDNet
- TEMA Technik und Management
- Ulrich's Periodicals Directory/ulrichsweb
- WanFang Data
- 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/>).

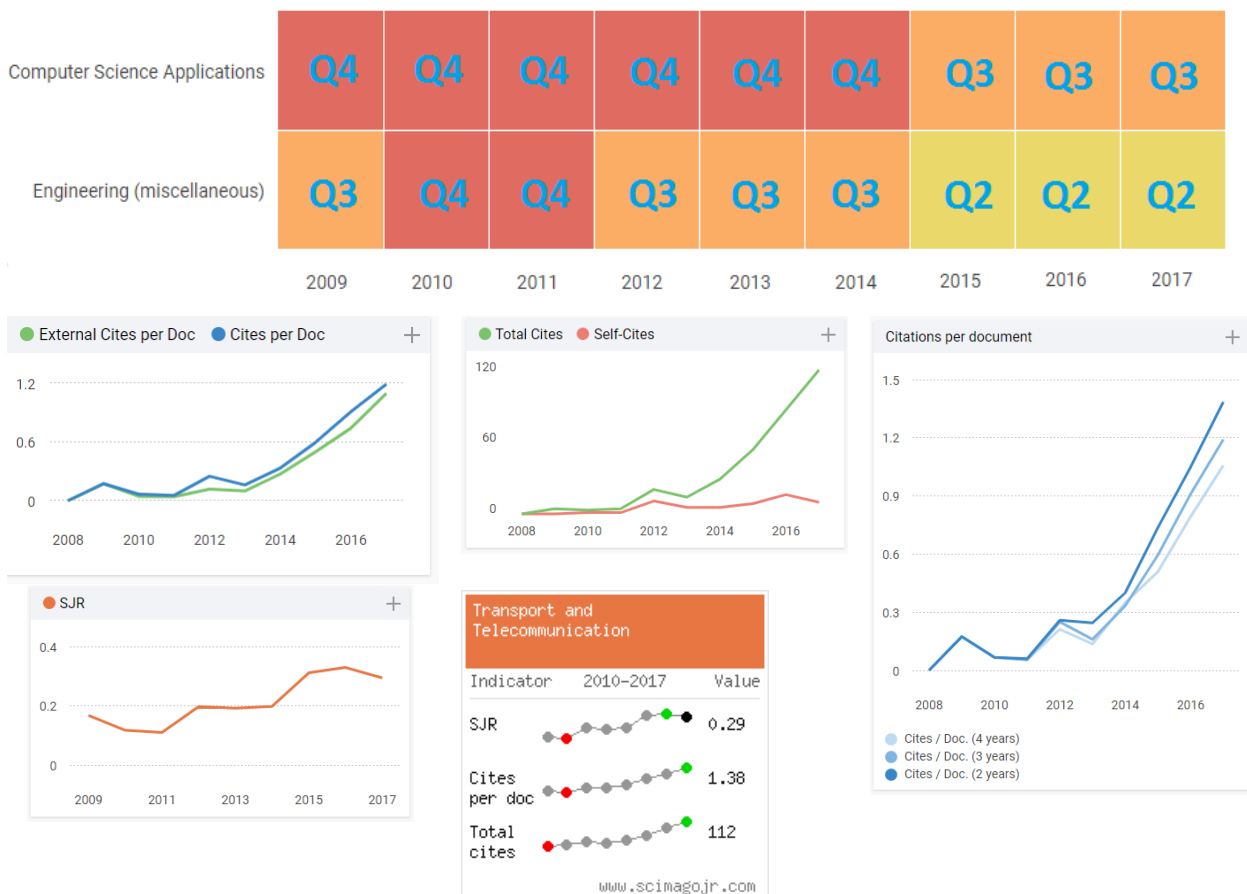


Figure 3 Transport and Telecommunication Journal performance

The significant improving in journal position based on the KPI values included in following Table: (Table 1.1.)

Table 1.1 Journal position based on the KPI

KPI	2017
H-index of the Transport and Telecommunication Journal	9
SJR indicator	0.294
Cites per document	1.191
International Collaboration	25.81%
Change the quality of the journal in following categories ¹ :	
• Computer Science application	Q3
• Engineering (Miscellaneous)	Q2

The journal of TSI “Transport and Telecommunications” is accepted for inclusion in the database of the Emerging Sources Citation Index (ESCI).

Emerging Sources Citation Index (ESCI) is a separate magazine index, which includes journals from fast-growing scientific areas. The index is considered as an "incubator" for the promotion of journals applying to be included in the core of Web of Science - Core Collection. Such journals first fall into the ESCI, and then are examined in the Science Citation Index, the Social Sciences Citation Index, Arts & Humanities Index.

Inclusion of TSI journal in this index is an achievement and recognition of the scientific activity of the institute at a high level.

TTI continues to regularly hold International Conferences, which are officially recognized by the international research community. The most significant among them is the TTI's Annual International Conference “Reliability and Statistics in Transportation and Communication” (that was reorganized to Multidisciplinary Conference in 2016). In 2017 RelStat-17 Conference was held on 18-21 October 2017. The number of participants in 2017 was increased by 10% and the number of participants from business-sector was also increased. 133 authors from 18 countries (Algeria; Austria; Czech Republic; Estonia; Finland; Germany; Greece; Hungary; India; Italy; Japan; Kazakhstan; Latvia; Lithuania; Poland; Russia; Slovakia; Ukraine) presented their researches.

The Conference Proceedings from 2017 were published in Springer as well as Indexing in Web of Sciences.

1.3. Research staff

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

Figures 4 and 5 show the dynamics regarding research staff in TTI starting from 2006.

¹ Based on data from SCImago Journal & Country Rank <http://www.scimagojr.com/>

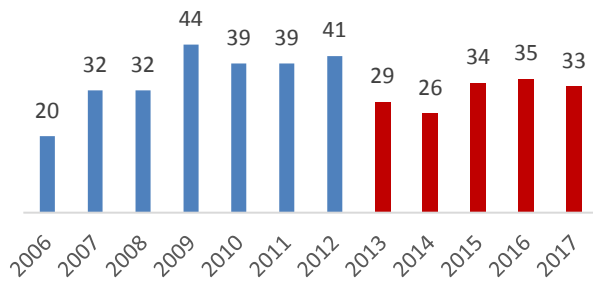


Figure 4 Research staff in the TTI

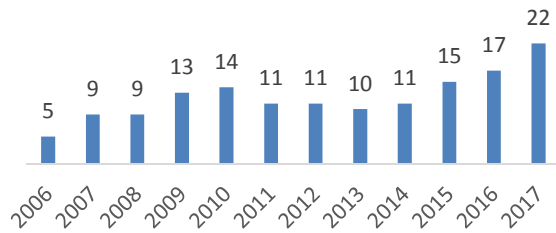


Figure 5 Research staff (FTE) in the TTI

Figure 6 shows the distribution of staff in the TTI faculties:

ME – Faculty of Management and Economics

TL – Faculty of Transport and Logistics

CST – Faculty of Computer Science and Telecommunication

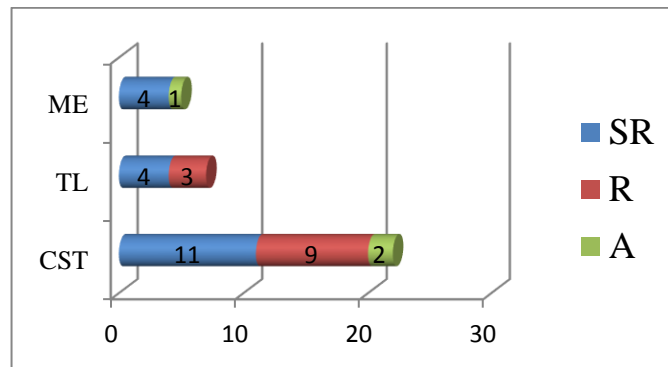


Figure 6 Distribution of staff in the TTI faculties

('SR' – Senior Researchers; 'R' - researchers, 'A' – Assistant Researchers).

2. RESEARCH OUTPUT

2.1. Number of scientific publications and other outputs

Table 2.1 Scientific publication/outputs, 2017

1. Original articles in anonymously refereed scientific journals cited in Thomson Reuters Web of Science, SCOPUS, ERIH or Engineering Village	64
2. Articles in other refereed scientific edited journals and conference proceedings	7
3. Monographs published ^[1]	3
4. Other scientific publications - proceedings ^[2]	13
5. Text books and other research-related publications	
6. Patents/ including international	1
7. Computer programs and algorithms ^[3]	
8. Registered cultivars	
9. Conference abstracts	73
10. Visiting lectures	4
11. Articles, radio and television programs and journals popularising science	2
12. Other ^[4]	2

^[1] Includes doctoral theses and monographs.

^[2] Includes edited proceedings, collections and special issues of scientific journals, and unrefereed scientific articles, excluding conference abstracts.

^[3] Approximates the number of programs and algorithms that have been in use outside the unit.

^[4] May include design products, prototypes, artefacts, exhibitions, performances etc.

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

1. Kabashkin, I. (2017) Dynamic Reconfiguration of Architecture in the Communication Network of Air Traffic Management System. *2017 IEEE International Conference on Computer and Information Technology (CIT)*, pp. 345-350. **Scopus, Web of Science**
2. Grakovski, A., Pilipovecs, A. (2017) Multi-purpose fibre optic system for automated vehicle's weighting-in-motion and classification in applications of intelligent transport systems. *5th IEEE International Conference on Models and Technologies for Intelligent Transportation Systems*, pp. 610-615. **Scopus, Web of Science**
3. Savrasovs, M. (2017). Traffic flow short-term forecasting system design and prototyping: Case study of Riga city. *5th IEEE International Conference on Models and Technologies for Intelligent Transportation Systems*, pp. 622-626. **Scopus**
4. Andronov, A. (2017) On a reward rate estimation for the finite irreducible continuous-time Markov chain, *Journal of Statistical Theory and Practice*, 11(3), pp. 407-417. **Scopus**
5. Kabashkin, I., Yatskiv, I., Savrasovs, M. (2017) Strategy for research development in the university. Case study of transport and telecommunication institute. *Transport and Telecommunication*, 18 (1), pp. 1-14. **Scopus, Web of Science**
6. Andronov, A.M. (2017) On Calculation of Estimators of Rational Regression Parameters. *Journal of Mathematical Sciences*, 221 (4), pp. 496-500. **Scopus**

7. Apsalons, R., Gromov, G. (2017) Using the min/max method for replenishment of picking locations. *Transport and Telecommunication*, 18 (1), pp. 79-87. **Scopus, Web of Science**
8. Andronov, A.M. (2017) On Nonparametric Estimation of the Mathematical Expectation of a Function of Random Variables with Identical Distributions. *Journal of Mathematical Sciences*, 220 (6), pp. 650-659. **Scopus**
9. Kabashkin, I. (2017) Resilient communication network of Air Traffic Management system. *Advances in Wireless and Optical Communications*, pp. 156-160. **Scopus**
10. Medvedev, A., Alomar, I., Augustyn, S. (2017) Innovation in airport design. *Aviation*, 21 (1), pp. 23-28. **Scopus, Web of Science**
11. Mitropoulos, L., Adamos, G., Nathanail, E., Yatskiv (Jackiva), I., Kabashkin, I. (2017) Building on European scientific excellence to develop an educational program on intermodal connections for Latvia and the region. *Transport*, 32 (1), pp. 79-93. **Scopus, Web of Science**
12. Alomar, I., Tolujevs, J., Medvedevs, A. (2017) Simulation of Ground Vehicles Movement on the Aerodrome. *Procedia Engineering*, 178, pp. 340-348. **Scopus, Web of Science**
13. Yatskiv, I., Budilovich, E. (2017) A comprehensive analysis of the planned multimodal public transportation HUB. *Transportation Research Procedia*, 24, pp. 50-57. **Scopus, Web of Science**
14. Rolik, Y. (2017) Risk Management in Implementing Wind Energy Project. *Procedia Engineering*, 178, pp. 278-288. **Scopus, Web of Science**
15. Faingloz, L., Tolujev, J. (2017) Simulation Modelling Application in Real-time Service Systems: Review of the Literature. *Procedia Engineering*, 178, pp. 200-205. **Scopus, Web of Science**
16. Andronov, A. (2017) Markov-modulated multivariate linear regression. *Acta et Commentationes Universitatis Tartuensis de Mathematica*, 21 (1), pp. 43-50. **Scopus, Web of Science**
17. Savrasovs, M., Pticina, I. (2017) Methodology of OD Matrix Estimation Based on Video Recordings and Traffic Counts. *Procedia Engineering*, 178, pp. 289-297. **Scopus, Web of Science**
18. Orlov, S., Vishnyakov, A. (2017) Hierarchical Criterion Approach for Architecture Structure Selection of Transportation Software. *Procedia Engineering*, 178, pp. 233-242. **Scopus, Web of Science**
19. Ishmuhametov, I., Palma, A. (2017) Unemployment as a Factor Influencing Mental Well-being. *Procedia Engineering*, 178, pp. 359-367. **Scopus, Web of Science**
20. Kabashkin, I. (2017) Channel dependability of the ATM communication network based on the multilevel distributed cloud technology. *Communications in Computer and Information Science*, 756, pp. 589-600. **Scopus**
21. Grakovski, A., Pilipovecs, A. (2017) Dynamics of Interaction between the Road Surface and Vehicle's Wheel in Fibre-optic System for Automatic Weighing in Motion of Transport. *Procedia Engineering*, 178, pp. 5-12. **Scopus, Web of Science**

22. Pavlyuk, D. (2017) Short-term Traffic Forecasting Using Multivariate Autoregressive Models. *Procedia Engineering*, 178, pp. 57-66. **Scopus, Web of Science**
23. Stetjuha, A. (2017) Manifestation and Record of the Externalities in the Transport Services Implementation. *Procedia Engineering*, 178, pp. 452-460. **Scopus, Web of Science**
24. Kabashkin, I. (2017) Risk modelling of blockchain ecosystem. *Lecture Notes in Computer Science*, pp. 59-70. **Scopus**
25. Skorobogatova, O., Kuzmina-Merlino, I. (2017) Transport Infrastructure Development Performance. *Procedia Engineering*, 178, pp. 319-329. **Scopus, Web of Science**
26. Podolyakina, N. (2017) Estimation of the Relationship between the Products Reliability, Period of Their Warranty Service and the Value of the Enterprise Cost. *Procedia Engineering*, 178, pp. 558-568. **Scopus, Web of Science**
27. Yatskiv, I., Budilovich, E. (2017) Evaluating Riga Transport System Accessibility. *Procedia Engineering*, 178, pp. 480-490. **Scopus, Web of Science**
28. Pozdnyakova, O., Pozdnyakov, A. (2017) Adult Students' Problems in the Distance Learning. *Procedia Engineering*, 178, pp. 243-248. **Scopus, Web of Science**
29. Kabashkin, I. (2017) Design of Embedded Architecture for Integrated Diagnostics in Avionics Domain. *Procedia Engineering*, 178, pp. 419-426. **Scopus, Web of Science**
30. Ishmuhametov, I., Kuzmina-Merlino, I. (2017) What Motivates a Learner Manager of a Logistic Company to Achieve Financial Literacy? *Procedia Engineering*, 178, pp. 76-84. **Scopus, Web of Science**
31. Popova, Y. (2017) Relations between Wellbeing and Transport Infrastructure of the Country. *Procedia Engineering*, 178, pp. 579-588. **Scopus, Web of Science**
32. Alomar, I., Tolujevs, J. (2017) Optimization of ground vehicles movement on the aerodrome. *Transportation Research Procedia*, 24, pp. 58-64. **Scopus, Web of Science**
33. Stukalina, Y. (2017) Management of a Technical University in the Context of Preparing Students for the 21st Century Careers in Science and Technology. *Procedia Engineering*, 178, pp. 249-257. **Scopus, Web of Science**
34. Lancovs, D. (2017) Building, Verifying and Validating a Collision Avoidance Model for Unmanned Aerial Vehicles. *Procedia Engineering*, 178, pp. 155-161. **Scopus, Web of Science**
35. Lancovs, D. (2017) Broadcast transponders for low flying unmanned aerial vehicles. *Transportation Research Procedia*, 24, pp. 370-376. **Scopus, Web of Science**
36. Mironov, A., Doronkin, P., Priklonsky, A., Kabashkin, I. (2017) The Role of Advanced Technologies of Vibration Diagnostics to Provide Efficiency of Helicopter Life Cycle. *Procedia Engineering*, 178, pp. 96-106. **Scopus, Web of Science**
37. Yatskiv, I., Savrasovs, M., Udre, D., Ruggeri, R. (2017) Review of intelligent transport solutions in Latvia. *Transportation Research Procedia*, 24, pp. 33-40. **Scopus, Web of Science**
38. Gromule, V., Yatskiv, I., Pēpulis, J. (2017) Safety and Security of Passenger Terminal: The Case Study of Riga International Coach Terminal. *Procedia Engineering*, 178, pp. 147-154. **Scopus, Web of Science**

39. Yatskiv, I., Budilovich, E., Gromule, V. (2017) Accessibility to Riga Public Transport Services for Transit Passengers. *Procedia Engineering*, 187, pp. 82-88. **Scopus, Web of Science**
40. Misnevs, B., Demiray, U. (2017) The Role of Communication and Meta-communication in Software Engineering with Relation to Human Errors. *Procedia Engineering*, 178, pp. 213-222. **Scopus, Web of Science**
41. Merlino, M., Sproge, I. (2017) The Augmented Supply Chain. *Procedia Engineering*, 178, pp. 308-318. **Scopus, Web of Science**
42. Kotane, I., Kuzmina-Merlino, I. (2017) Analysis of Small and Medium Sized Enterprises' Business Performance Evaluation Practice at Transportation and Storage Services Sector in Latvia. *Procedia Engineering*, 178, pp. 182-191. **Scopus, Web of Science**
43. Yatskiv, I., Savrasovs, M., Kabashkin, I., Nathanail, E., Adamos, G., Mitropoulos, L. (2017) Knowledge Sharing Strategy as a Key Element of the H2020 Programme: Enhancing Excellence and Innovation Capacity in Sustainable Transport Interchanges (Alliance) Project. *Procedia Engineering*, 187, pp. 458-464. **Scopus, Web of Science**
44. Šarkovskis, S., Jeršovs, A., Kolosovs, D., Grabs, E. (2017) Encoder Improvement for Simple Amplitude Fully Parallel Classifiers Based on Grey Codes. *Procedia Engineering*, 178, pp. 604-614. **Scopus, Web of Science**
45. Krainyukov, A., Krivchenkov, A., Saltanovs, R. (2017) Performance Analysis of Wireless Communications for V2G Applications Using WPT Technology in Energy Transfer. *Procedia Engineering*, 178, pp. 172-181. **Scopus, Web of Science**
46. Roskosa, A., Stukalina, Y. (2017) Integrating Transferable Skills into the Curriculum in the Framework of the Management of Study Programmes in Higher Education Institutions of Latvia. *Rural Environment, Education, Personality*, 10, pp. 457-465. **Web of Science**
47. Orlov, S., Vishnyakov, A. (2017) Decision Making for the Software Architecture Structure Based on the Criteria Importance Theory. *Procedia Computer Science*, 104, pp. 27-34. **Web of Science**
48. Kabashkin, I., Kundler, J. (2017) Reliability of Sensor Nodes in Wireless Sensor Networks of Cyber Physical Systems. *Procedia Computer Science*, 104, pp. 380-384. **Web of Science**
49. Nechval, N.A., Berzins, G., Balina, S., Steinbuka, I., Nechval, K.N. (2017) Constructing unbiased prediction limits on future outcomes under parametric uncertainty of underlying models via pivotal quantity averaging approach. *Australian Journal of Political Science*, 51 (5), pp. 331-336. **Scopus**
50. Pavlyuk, D. (2017) Study of a spatial structure of urban traffic flows using a regime-switching vector autoregressive model. *CEUR Workshop Proceedings*, pp. 151-160. **Scopus**
51. Hofmann, W., Assmann, T., Neghabadi, Z.D., Cung, V.-D., Tolujevs, J. (2017) A simulation tool to assess the integration of cargo bikes into an urban distribution system. *5th International Workshop on Simulation for Energy, Sustainable Development and Environment, SESDE 2017, Held at the International Multidisciplinary Modeling and Simulation Multiconference, I3M 2017*, pp. 11-20. **Scopus**
52. Nechval, N.A., Nechval, K.N. (2017) Finding an unbiased warranty length for a product under parametric uncertainty of underlying lifetime models. In: *Mechanical Systems: Research, Applications and Technology*, pp. 165-188. **Scopus**

53. Andronov, A.M., Rykov, V.V., Vishnevsky, V.M. (2017) On reliability function of a parallel system with three renewable components. *Lecture Notes in Computer Science*, pp. 199-209. **Scopus**
54. Verseckiene, A., Palsaitis, R., Yatskiv (Jackiva), I. (2017) Evaluation of alternatives to integrate special transportation services for people with movement disorders. *Transport and Telecommunication*, 18 (4), pp. 263-274. **Scopus, Web of Science**
55. Apsalons, R., Gromov, G. (2017) Methodology of evaluation of the impact of picking area location on the total costs of warehouse. *Transport and Telecommunication*, 18 (4), pp. 332-344. **Scopus, Web of Science**
56. Skripniks, D., Sarkovskis, S., Yershov, A., et al. (2017) Impulse Response Approximation of Digital Finite Impulse Response Filter with Delay Line Units. *Automatic control and computer sciences*, 51 (4), pp. 279-284. **Web of Science**
57. Krainyukov, A., Krivchenkov, A., Saltanovs, R. (2017) Program of specialists' training in the field of robotics. *International journal on information technologies and security*, 9 (1), pp. 51-58. **Web of Science**
58. Medvedev, A., (2017) The possibility of distance learning in aircraft specialists training. *International journal on information technologies and security*, 9 (1), pp. 59-64. **Web of Science**
59. Podjacevs, P., Skorobogatova, O. (2017) Computer role-playing games as one of the most efficient methods of teaching and learning in higher education. *International journal on information technologies and security*, 9 (1), pp. 65-78. **Web of Science**
60. Yatskiv (Jackiva), I. (2017) Why don't women choose STEM? Gender equality in STEM careers in Latvia. *International journal on information technologies and security*, 9 (1), pp. 79-88. **Web of Science**
61. Jusas, V., Ros, J. N., Misnevs, B. (2017) Software Engineering Competence Remote Evaluation Process Model. *Baltic journal of modern computing*, 5 (3), pp. 317-327. **Web of Science**
62. Gromovs, G., Lammi, M. (2017) Blockchain and internet of things require innovative approach to logistics education. *Transport Problems*, 12, pp. 23-34. **Scopus, Web of Science**
63. Kabashkin, I. (2017) Reliable V2X Communications for Safety-critical Intelligent Transport Systems. *Advances in Wireless and Optical Communications (RTUWO)*, pp. 251-255. **Web of Science**
64. Stukalina, Y. (2017) Some issues associated with strategy formulation and strategic planning in a contemporary university. *European Proceedings of Social and Behavioural Sciences*, 34, pp. 1-11. **Web of Science**

2.4. Patents

Table 2.2 Patents confirmed in 2017 (hold by TTI)

Title	Inventor	Applicant	Nr./Year
Method and device for control of wind-mill	Jurijs Roliks	TTI	LV15217 (A) 2017-03-20

3. MASTER AND DOCTORAL TRAINING / ACTIVITIES

3.1. Number of students

Table 3.1 Master and Doctoral degree students

Position	2017
Completed their master's degree	31
Enrolled in doctoral studies	3

3.2. Scope of doctoral program activities

In 2017, the strategy for the development of the doctoral program of the TSI was updated - the choice of research subjects is more focused on international cooperation and cooperation with business partners. 15 research topics for doctoral students that can be supported within the framework of the ALLIANCE international project are proposed.

In 2017, 3 candidates accepted in the doctoral program of TSU: Avdeykin A. (lead by Savrasovs M.); Jackson I. (lead by Toluyev Y.); Sayfutdinov F. (lead by Toluyev Y.)

In 2017 4 project submissions were made for specific support objective activity 1.1.1.2. "Post-doctoral Research Aid" (Project id. N. 1.1.1.2/16/I/001) of the Republic of Latvia, funded by the European Regional Development Fund.

3 of the projects were approved for the duration of 3 years with the total 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.

The approved projects are:

a) "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.

The main objectives of the project are:

- Estimation of the Markov-modulated linear regression parameters and forecasting of traffic flows on real data, taking into account the influence of the "external environment"
- Development of the Markov-modulated linear regression model (multivariate regression, the case of a sample with missing data)
- Development of algorithms for estimating Markov-modulated regression parameters based on big data.

b) "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.

The key project objectives are:

- Applying modern multivariate models for traffic flow forecasting for testing their validity and identifying shortcomings;

- Developing responsive models, which take potential unexpected changes of a road network into account in real-time;
- Developing computational algorithms, which will allow estimating multivariate model parameters on the base of large data sets and adapting these estimates for dynamically obtained data.

c) „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 system for energy distribution and management.

The current research project includes objectives in three main fields:

- energy generation and environment,
- energy distribution and management
- energy policy and economy.
- Every objective is independent and valuable by itself, but altogether they provide a combination where every part interacts with others and contributes to a complete energy model.

In 2017, two promotional works for the doctoral degree successfully defended:

Table 3.2 Promotional works for the doctoral degree

Name (given name and family name)	Topic of dissertation	Supervisors	Present employment (job description, organisation)
Andrejs Zvaigzne	Decision making at the early stages of the design of a multifunctional special purpose ship with modularly oriented architecture		Latvian Maritime Academy, Acting Rector
Marina Rebezova	Logistics and optimization of ancillary aviation services on air transport		JSC “Transport Clearing House”, Head of none resident’s department

4. NATIONAL AND INTERNATIONAL COLLABORATION

4.1. National collaboration

The table below indicates the most significant activities in collaborations and cooperation with research and academic organizations, enterprises and companies, both local and international levels. In compare with 2016 annual period, increased activities with enterprises, as well as numbers of joint projects and collaboration with research/academic organizations.

Table 4.1 Scope of national and international collaboration

ORGANIZATION	COLLABORATION
National Research Organizations	Type of collaboration / projects
Institute of electronics and computer science	- Cooperation agreement - Collaboration in Project proposals formulation
Institute of Physical Energetics (IPE)	- Participation in "RelStat17"
ORGANIZATION	COLLABORATION
National Universities	Type of collaboration / projects
Riga Technical University	- Common Project Participation (NextIT, Cross Border Cooperation Program EduRail); - Participation in Doctoral Review Committee
University of Latvia	- Joint scientific articles
Latvian Maritime Academy	- Mobility - Doctoral Program student
Vidzeme University of Applied Sciences (ViA)	- Participation in "RelStat17" Program Committee - Participation in robotic competition organization
Latvia University of Agriculture	- Common Project participation (NextIT) - Joint scientific articles -
Ventspils University College	- Joint Project participation (NextIT)
Local Enterprises	Type of collaboration / B2B projects
"Accenture Latvia"	- "Java" training development in TTI - Participation in TTI "career day" - Open lectures in TTI - Scientific seminars
"X INFOTECH" Ltd	- Joint Competition of scientific works for TTI Students - Development of joint Laboratory IPB & ABC in TTI - Participation in TTI "career day" - Scholarships grants for TTI Students - Open lectures in TTI (IT; ICT)
"Riga International Coach Terminal"	- Joint scientific articles - Participation in Workshops - Participation in TTI international Project "ALLIANCE", - TTI participate in Council of External Experts
UNISEB Ltd	- Traffic flow survey and simulation project

4.2. Scope of national cooperation projects

Table 4.2 Scope of national cooperation projects

Project	Agreement No
Non-traditional regression models in transport modeling	1.1.1.2/VIAA/1/16/075
Spatiotemporal urban traffic modelling using big data	1.1.1.2/VIAA/1/16/112
Integrated Model for Energy Generation, Distribution and Management	1.1.1.2/VIAA/1/16/095
Modernisation of Transport and Telecommunication institute STEM study programmes	8.1.1.0/17/I/009
Project The next generation information and communication technology (ICT) research state program, (“Next_IT”)	10-4/VPP-12/9

4.3. International collaboration

Table 4.3 Scope of international collaboration in projects

HORIZON 2020	
TYPE OF COLLABORATION	FIELD OF SCIENCE
International Project Enhancing excellence and innovation capacity in sustainable transport interchanges (ALLIANCE)	Research / education
ERASMUS+	
TYPE OF COLLABORATION	FIELD OF SCIENCE
Project Implementation of Software Engineering Competence Remote Evaluation for Master Program Graduates (iSecret)	Research / education
ERASMUS+ KA2	
TYPE OF COLLABORATION	FIELD OF SCIENCE
Spread your wings (SYW)	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
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 TU1305 Social networks and travel behavior	ICT / social
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
Project TU1208: Civil Engineering Applications of Ground Penetrating Radar	Engineering / Electronics

Table 4.4 Scope of conferences, workshops and seminars

CONFERENCES					
Conference	Date	Total participants	Given Presentations	Total Authors	Countries
Annual International Conference «Research and Technology – Step into the Future»	21/04/2017	82	52	55	3 presentations were given by master students from Higher School of Economics – Saint Petersburg
International scientific and educational conference "Actual problems of education (MIP-2017)"	01/06/2017 - 02/06/2017	84	47	66	Greece, Spain, Latvia, Lithuania, Poland, ASV
International Multidisciplinary Conference "Reliability and Statistics in Transportation and Communication (RelStat-2017)"	18/10/2017 - 21/10/2017	124	78	133	Algeria, Austria, Czech Republic, Estonia, Finland, Germany, Greece, Hungary, India, Italy, Japan, Kazakhstan, Latvia, Lithuania, Poland, Russia, Slovakia, Ukraine
Annual International Conference «Research and Technology – Step into the Future»	8/12/2017	74	42	39	Local participants

Table 4.5 Workshops and seminars

Workshop/Seminar	Period
Round table in the frame of Carrier Day "Effective and qualitative cooperation for companies"	22/03/2017
Workshop for the specialists dealing with the issues of non-destructive testing of aviation equipment, in cooperation with UAB Vegastel”, LT; “OLYMPUS”	11/05/2017

Workshop/Seminar	Period
Special Session of the iSecret project: "Competence oriented Approach "iSECRET Results Dissemination"	01/06/2017-02/06/2017
1st Summer School "Sustainable Transport Interchanges Program (STIP) - Part 1: Freight transportation"	17/07/2017-21/07/2017
The seminar "Modeling the impact of road safety communication campaigns and training programs on driving behavior" (part of his PhD, focusing on road safety and driving behavior)" by guest lecturer Giannis Adamos from University of Thessaly (Greece)	21/09/2017
Special Session of the SMART Log project	18.10.2017
Trains the trainers seminar "Sustainable Interchanges Program (STIP): Experience and Impressions after 1st Summer School"	19/10/2017
Young Researchers Seminar "Sustainable Transport Interchanges"	20/10/2017
Special Session of the NexIT project: Intelligent Transport Systems and Telematics"	20/10/2017
The 1st open workshop SCIENCE-TO-BUSINESS: "SCI-BI: Digitalization in Logistics and Transport"	08/12/2017

Table 4.6 Courses

Course	Period
Course "Decision making methodologies" for master and PhD students by Eftihia Nathanail from University of Thessaly (Greece)	10/04/2017-13/04/2017
The "Big Data" course of lectures for the master's degree programme students of the Faculty of Telecommunication and Computer Sciences by Invited professor Neil Rubens	08/09/2017- 17/10/2017
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.	08/09/2017- 7/10/2017

In compare with 2016 annual period, increased performance of international conferences, workshops and seminars/courses activities in TTI. The KPI above shows the TTI R&D sector progress in communication, cooperation, networking and knowledge sharing/transfer in international levels, which is very important for strengthen scientific and research activity and development progress.

4.5. Most important foreign collaborators

Table 4.7 Scope of important foreign collaboration

Organization	Type of collaboration	Country
Academic organizations	Cooperation	
Wroclaw University of Technology	- Scientific and academic activities - Mobility-program activities	Poland
UPM	- Scientific and academic activities	Spain
Deusto	- Visited researcher - Sign of Collaboration Agreement (ERASMUS program) - Joint development of Project proposals Horizon 2020 program	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 - Participation in to joint Project Proposals development (Horizon2020 Program) - Organization 1st Summer School in Riga for PhD and MS students	Greece
VSEI of Lublin	- Researcher and academic mobility	Poland
Vilnius Gediminas Technical University (VGTU)	- Conference Participation - Guest redactors for Conference Proceedings - Research Collaboration	Lithuania
Arab Academy for Science, Technology and Maritime	- Visit to TTI; Cooperation agreement	Egypt
Research Institutes	Cooperation	
Fraunhofer-gesellschaft zur foerderung der angewandten forschung e.v.	- 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
Transport Research Centre (CDV)	- signed an agreement of cooperation	Czech Republic
CERTH	- Joint development of 2 Project proposals Horizon 2020 program	Greece

Enterprises	Cooperation	
National Company Kazkosmos	- Collaboration Agreement	Kazakhstan
National Centre of Space Research and Technology	- Collaboration Agreement	Kazakhstan
Bulgarian Association for Management Development and Entrepreneurship, BAMDE	- TTI Membership of the Advisory Committee of the Annual International Scientific conference	Bulgaria

4.6. Most important outcomes of the visits and collaboration contacts

Table 4.8 Scope of important outcomes and collaboration contacts

EVENT	COLLABORATION
ORGANIZATION/EVENT	DESCRIPTION
ECTRI	The first meeting of new elected Board was held on March 15, 2017 at the ECTRI offices. The Board that took office on January 27, 2017 met to discuss the present-day management issues, to draw the new Implementation Plan and establish new priorities for its two-year mandate. Professor Irina Yatskiv (Jackiva), TTI Vice-Rector as Member of ECTRI Board also attended the meeting.
Transport Research Centre (CDV)	In October 2017 Transport and Telecommunication (TSI) and Transport Research Centre (CDV) signed an agreement of cooperation. Purpose of the agreement - establish hereby a formal mutual cooperation in the field of research and education, which is intended to further the scientific and academic objectives of each institution and to promote better understanding between the faculties and students of TTI and CDV.
ORGANIZATION	DESCRIPTION
20th International Conference TransBaltica	On 25 – 26 May 2017 the project coordinator of the ALLIANCE project Prof. Irina Yatskiv (Jackiva) took part in 20th International Conference TransBaltica 2017, Riga, Latvia. The aim of the conference was to unite decision-makers, industry representatives, public sectors and academia to discuss significant issues of the transportation in the Baltic Sea region.
World Expo 2017	Transport and Telecommunication Institute (TSI) participates in a World Expo, which is being held in the capital of Kazakhstan, Astana. The core theme of the Expo is “Future Energy”. TTI represented in pavilion “Meeting Place – Latvia. Energy in our nature”.
INTERNATIONAL DELEGATION	DESCRIPTION
Arab Academy for Science, Technology and Maritime	On 7 June 2017, Transport and Telecommunication Institute (TSI) was visited by the representatives of the Arab Academy for Science, Technology and Maritime - Rector Dr. Khaled Abdalla El Sakty and President Prof. Ismail Ghaffar. Prof. Ismail Ghaffar is the acting adviser of the Transport Ministers of the League of Arab States and the African Union. Directed by Dr. Khaled Abdalla El Sakty, the Academy takes active part in different projects of the European Union, and currently is actively searching for partners in the EU

	<p>countries for the port development project. The partners from Egypt representing the private sector and those from Great Britain representing the academic sector are already participating in the project. Moreover, Dr. Khaled had analysed the work of the transport sector of Latvia, and he uses the data obtained in the course of said studies in the training process. Within the framework of the meeting, a cooperation contract was signed, including in the field of training of doctoral students under the TSI program Telematics and Logistics.</p>
<p>10th International Logistics Workshop during the science week in Magdeburg</p>	<p>A workshop has been conducted by the Otto von Guericke University Magdeburg in cooperation with the Fraunhofer IFF for doctoral students doing research in logistics for the tenth year in a row. This year, doctoral students and lecturers of TSI were able to participate in it thanks to the support provided by the ALLIANCE Project. Scientists from seven countries (Hungary, Ukraine, Cuba, Latvia, Germany, France and Greece) participated at the 10th anniversary workshop. Reports were presented by 17 doctoral students, including four of TSI. After the presentation, the papers were discussed in sufficient detail in different groups of scientists formed specifically by taking into account the subject of the reports. The doctoral students received a large number of useful comments and recommendations for continuing their research. Since participation in the workshop was part of a planned know-how exchange programme within the ALLIANCE Project, we asked one of the participants of the workshop, Evelina Budilovich, a 2nd year doctoral student doing her studies in the Telematics and Logistics Program.</p>
<p>Guest lecture by the Giannis Adamos</p>	<p>On September 21, 2017 a guest lecturer held a seminar at the TSI. The seminar's theme: "Modeling the impact of road safety communication campaigns and training programs on driving behavior" (part of his PhD, focusing on road safety and driving behavior)". Giannis Adamos - Transportation Engineer (PhD, MSc), University of Thessaly, Department of Civil Engineering Traffic, Transportation and Logistics Laboratory - TTLog.</p>
<p>COOPERATIONS</p>	<p>DESCRIPTION</p>
<p>Delegation from Nation-Building Institute, Thailand</p>	<p>On 6 September 2017, the Faculty of Computer Sciences and Telecommunications of Transport and Telecommunication Institute (TSI) hosted the delegation of students and management of Nation-Building Institute (NBI). Nation-Building Institute (NBI) is a non-profit organization based in Thailand. The Institute's tasks entail training of senior executives with the aim to enhance leadership, management and morality of leaders in public, private and civic sector so that they stay in step with the times and are able to manage their organizations applying the techniques that facilitate strengthening and development of Thailand.</p>

4.7. Important scientific cooperation events

First Summer School in the framework of the ALLIANCE Project

- In 2017, July 22 with great success ended the first summer school in the framework of the ALLIANCE project (<http://alliance-project.eu/>). The summer school was held at the Transport and Telecommunications Institute (TTI) in cooperation with the ALLIANCE project partners: the Thessaly (TTLog, UTH) Laboratory of Traffic, Transportation and Logistics, and the Fraunhofer Institute (IFF). During the week, 25 students of master's and doctoral programs in the field of Transport and Logistics from Latvia, Greece, Germany and Lithuania were trained according the program "Sustainable Transport Interchanges: Freight Transportation". The students were interested in decision making methodology and business models for transport terminals. Of particular interest to the students were courses on Methodology of decision making and Business models for transport terminals. The audience presented their mini project results, which were prepared by international teams throughout the week. Competent international jury consisting of: Deputy Director of the Finance and Development Planning Department of the Ministry of Transport, Inta Rozenšteina, Member of the Board of the European Transport Association Graham Ellis (UK), Prof. Eftihia Nathanail (UTH) and Prof. Irina Yatskiv (TTI) highly appreciated all the work and pointed out that every work could be a good basis for further research work.

The final transnational partner meeting in frame of the “iSECRET” project

- By 1 and 2, 2017, the project “Implementation of Software Engineering Competence Remote Evaluation for Master Program Graduates (iSECRET)” (project no. 2015-1-LV01-KA203-013439) partners met for their final transnational work meeting “iSECRET Project Results Dissemination” in Riga (Latvia). Representatives of organizations implementing the project iSECRET coming from Greece, Lithuania, Poland, Spain and Bulgaria met at the headquarters of the Transport and Telecommunication Institute to discuss in depth the work that had been done and has presented progress of the project. The meeting was held in conjunction with International Conference MIP2017 "Contemporary Problems of Education". The Transport and Telecommunication Institute was implemented the project ISECRET Implementation. The Project aims to facilitate interchange between educational systems and collaboration in the field of personnel training at the regional and European level. The Project implanted the creation of an operational prototype web portal SECEIP for the graduates of the master's degree programs in SE&ST, as well as the design, implementation and assessment of the basic ECTS-oriented framework structure (for a joint master's degree program in the field of SE&ST), etc.

4.8. Invited researchers in TTI in 2017 (Short time scientific missions)

1) Kahlouche Abdelaziz (Algeria)

- Organisation: Frères Mentouri, Constantine University, Laboratory of Transport Engineering and Environment
- Stay period: 01.10.2017 - 30.10.2017
- Research area: Urban railway safety

- Short description of the research area: In this research area we are interested in the safety of urban railway transport. The purposes of this study are to analysis and improve the tram safety in the city of Constantine in Algeria recently benefited of this means of transport.
- Scientific supervisor: Prof., Dr.sc.ing. I.Yatskiv.

2) Nika Tikanashvili (Georgia)

- Organisation: Georgian Aviation University
- Grant: “Latvian State Fellowships For Research 2017” Supported By The Latvian State Education Development Agency
- Stay period: from 10.10.2017 to 09.02.2018
- Research area: Maintenance of Air Navigation Systems
- Short description of the research area: Research and development of mathematical model for estimation of accuracy of radionavigation systems of aircraft position in the terminal area. Study of modern problems of existing radionavigation systems and the ways for their determination; investigation of the optimal arrangement of radionavigation aids at the airports with runways less than 2km.
- Scientific supervisor: Professor, Dr.hab.sc.ing. Igor Kabashkin.

3) Dr. Giannis Adamos (Greece)

- Organisation: University of Thessaly, Traffic, Transportation and Logistics Laboratory
- Grant: ALLIANCE project (Grant agreement no.: 692426)
- Stay period: from 17.09.2017 to 23.09.2017
- Research area: Passenger transport accessibility at interchanges
- Short description of the research area: Seamless intermodal transport is an appealing concept that enables individuals to travel to their destination in the most efficient, comfortable, safe and quick way. Transport interchanges can support this concept, since they link movements between different transportation modes and routes. The objectives of this research are to assess accessibility at interchanges and suggest ways to improve it, study current information provision systems, indicate the level of coordination between different transportation modes and the relevant involved stakeholders, and lastly, investigate the design of interchanges and recommend sustainable solutions that can make them more functional and aesthetically pleasant.
- Scientific supervisor: Prof., Dr.sc.ing. I.Yatskiv

4) Ioannis Karakikes (Greece)

- Organisation: University of Thessaly
- Grant: COST TU1305
- Stay period: from 17.09.2017 to 23.09.2017
- Research area: Simulation and impact assessment of innovative systems for urban freight distribution
- Short description of the research area: This visit’s research focus lies on ultra-urbanized smart cities that combine dense passenger and freight travel systems. Throught this scientific mission the PhD cand. will become familiar with factors that determine travel behavior, review global ICT platforms and examine the connection between social media and urban freight distribution with the use of simulation tools.

- Scientific supervisor: Dr.sc.ing. Mihails Savrasovs

5) Gani Askarov (Kazakhstan)

- Organisation: Al-Farabi Kazakh National University
- Grant: Al-Farabi Kazakh National University
- Stay period: from 01.09.2017 to 25.11.2017
- Research area: Transport logistics
- Short description of the research area: The purpose of this study is to develop a methodology for organizing freight road transport based on logistics principles to improve the efficiency and reliability of the transportation process in the Republic of Kazakhstan.
- Scientific supervisor: Dr.hab.sc.ing. Jurijs Tolujevs

4.9. Non-academic collaboration

Science-To-Business open seminar: From Data to Added Value: points of view and solutions

- TTI continues to actively participate in national and international associations, realizing knowledge sharing and transfer through the invited lectures, mutual consultations, joint projects, common research and B2B R&D activities. Since 2017 Transport and Telecommunication Institute (TSI) launches a series of open seminars «Science-to-Business». The 1st seminar that dedicated to a topic From Data to Added Value: points of view and solutions was held on 8th December 2017. The seminar was conducted by Accenture professionals, TSI Master and PhD graduates and researchers, who share their usage experience of different aspects of Data Science.

Business innovations and technology Riga Comm 2017 conference

- In November 2017, the annual exhibition dedicated to business innovations and technology RIGA COMM 2017 was held in Riga. In addition to the exhibition, the program also comprised seminars about such actively developing key technologies as artificial intelligence, cloud computing, blockchain, cyber security, smart business solutions, computer vision and many others. At the exhibition, TSI was represented at the demonstration stand with a sensor WIM (Weigh-in-Motion) solution system which our leading researcher, professor of the Faculty of Computer Sciences and Telecommunication Aleksandrs Grakovskis was concerned with in the last few years. At the exhibition, everyone could see for themselves and personally test the operating principle of the device developed by TSI researchers. The solution propose by TTI is based on the analysis of distortion of the signal transmitted via optic fiber which results from its deformation when a vehicle runs over it. The key component of the technology is a set of algorithms developed at TTI which calculate the mass of a vehicle and axle load by analyzing signal distortions. The technology represented was being developed at TSI in the course of several years, whereas the beginning and fundamental researches were conducted within the framework of the project SVARI with the financing from the ERAF fund. Now this technology is being actively improved and finds a new use, for example, to calculate and classify vehicles under the research program National Next Generation ICT Research Program. Project No. 3.2 Sensor Network and Signal Processing Use in National Economy.

Table 4.9 Non-academic collaboration

Name and Organisation	Type of collaboration	Country
Latvian Electrical Engineering and Electronics Industry Association (LETERA)	Membership, common research	Latvia
Latvian Information and Communications Technology Association (LIKTA)	Membership, common research	Latvia
Name and Organisation	Type of collaboration	Country
Latvian Telecommunication Association (LTA)	Membership invited lectures, common research	Latvia
Informatics Europe	Membership, information exchange	Switzerland
European Conference of Transport Research Institutes (ECTRI)	Membership, information exchange, reviewing	EU
The European Council for Small Business and Entrepreneurship, ECSB	Collaboration. The Network of the ECSB – more than 30 countries.	International Network; Secretariat in Turku, Finland www.ecsb.org
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, common projects	Latvia
LVCA (Latvian Venture Capital Association)	Scientific experience exchange; TSI students' Master thesis supervision.	Latvia

5. MEMBERSHIPS IN EDITORIAL BOARDS OF SCIENTIFIC JOURNALS

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

Table 5.1 TTI staff memberships in editorial boards of scientific journals

Name	Journal	Period
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 	<ul style="list-style-type: none"> 1997 – present 1999 – present 1999 – present 1999 – present 2002 – present 2002 – present 2007 – present 2010 – present 2011 – present 2012 – present
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 	<ul style="list-style-type: none"> 2005 – present 2005 – present 2011 – present 2012 – present 2014 – present 2016 – present
Alexander Grakovski	<ul style="list-style-type: none"> - Transport and Telecommunication (ISSN 1407-6160), Latvia 	2015 – present
Juri Tolujew	<ul style="list-style-type: none"> - Transport and Telecommunication (ISSN 1407-6160), Latvia 	2012 – present
Alexander Andronov	<ul style="list-style-type: none"> - Automatic Control and Computer Sciences (ISSN 0146-4116), Latvia 	2005 – present
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 	From 2010

Na	Name	Journal
Kuzmina-Merlino Irina	- International Management Journals, United Kingdom, London. ISSN: 1742-528X (on-line Journals), IMJ Editorial Advisory Board http://www.managementjournals.com/editorialteam.htm	From 2005
	- The Clute Institute, Journal of Business Case Studies, ISSN 1555-3353 (print); ISSN 2157-8826 (online) Reviewers' team http://journals.cluteonline.com/index.php/JBCS/about/display/Membership/39	From 2012
	- Emerald Emerging Markets Case Studies Journal, Reviewer http://www.emeraldgroupublishing.com/reviewers/index.htm	From 2015
	- 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	Since 2017
	- Journal "Forum Scientiae Oeconomia" , Warsaw, Poland (ISSN 2300-5947 - printed, ISSN 2353-4435 - online), reviewer http://www.wsb.edu.pl/reviewers.m.f.2039	2016 – present
Aleksandr Medvedev	- Journal of Traffic and Transportation Engineering. David Publishing Company. New York, USA – editorial board member	From 2015
Užule, K	- Scientific Journal of the Siberian Federal University (Russia) "Gumanitarnije nauki", ISSN 2587-6066, http://journal.sfu-kras.ru/series/humanities/editorial-board	2016 – 2017
Boriss Misnevs	- International Journal on Information Technologies and Security Special Issue № SP1/2017 ISSN 1313-8251 Indexed in ESCI of Thomson Reuters, co-editor	2017
	- Journal of Educational and Instructional Studies in the World – WJEIS – ISSN: 2146 – 7463. - http://www.wjeis.org/?pnum=6&pt=Editorial%20Board	2015 – present
	- International Women OnLine Journal on Distance Education - WOJDE, ISSN: 2147-0367) - http://www.wojde.org/?pnum=5&pt=Editorial%20Board	2016 – present

5.2. Memberships in Programme and Organization Committee of Scientific Conferences

Table 5.2 TTI staff memberships in Programme and Organization Committees of scientific conferences

Name	Memberships in	Period
Igor Kabashkin	- Programme and Organization Committee of the International Conference “Reliability and Statistics in Transport and Communication”, (RelStat), Riga, Latvia	1999 – present
	- Programme Committee of the International Conference “European-Asian Transport Corridors: Trends. Strategies. Practices”	2015 – present
	- Programme and Organization Committee of the Conference “Research and Technology – step to the future, Riga, Latvia	2006 – present
	- Programme Committee of the Conference “Actual Problems of Education”, Riga, Latvia	2009 – present
Irina Yatskiv	- Programme and Organization Committee of the International Conference “Reliability and Statistics in Transport and Communication”, (RelStat), Riga, Latvia	1999 – present
		2016

	<ul style="list-style-type: none"> - Scientific Committee of the 3rd International Conference on Sustainable Urban Mobility – 3rd CSUM in Volos, Greece on 26 – 27 May 2016. - Programme Committee of the International Conference on Information and Digital Technologies 2016 (IDT'2016). July 5 - 7, 2016, Rzeszów, Poland - Programme Committee of the International Conference on Dependability and Complex Systems (DepCoS-RELCOMEX), Wroslaw, Poland - Programme and Organisation Committee of the International Symposium on Stochastic Models in Reliability, Safety, Security and Logistics, Beer Sheva, Israel, - Programme and Organization Committee of the 16 International Conference for junior researchers «Science-Future of Lithuania. Transport», VGTU (Lithuania) - 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 - Programme Committee of the International Conference on Information and Digital Technologies 2016 (IDT'2016). July 5 - 7, 2016, Rzeszów, Poland - Scientific Committee of EURO Working Group on Transportation Meeting (EWGT), Budapest, 4-6 September 2017, http://ewgt2017.bme.hu/committees/ 	<p style="text-align: center;">2016</p> <p style="text-align: center;">2012 – present</p> <p style="text-align: center;">2005, 2010, 2016</p> <p style="text-align: center;">2015 – present</p> <p style="text-align: center;">2006 – present</p> <p style="text-align: center;">2009 – present</p> <p style="text-align: center;">2016</p> <p style="text-align: center;">2017</p>
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 	<p style="text-align: center;">2014 – present</p> <p style="text-align: center;">2009 – present</p> <p style="text-align: center;">2012 – present</p>
Juri Tolujew	<ul style="list-style-type: none"> - The Winter Simulation Conference 2014, Savannah, GA, USA, December 7-10. Track «Logistics, SCM and Transportation». - Programme and Organization Committee of the International Conference “Reliability and Statistics in Transport and Communication”, (RelStat), Riga, Latvia. 	<p style="text-align: center;">2014</p> <p style="text-align: center;">2014 – present</p>
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 - International Conference on Mobile Learning 2017 10 – 12 April Budapest, Hungary http://mlearning-conf.org/committees/ 	<p style="text-align: center;">2009 – present</p> <p style="text-align: center;">2012 – present</p> <p style="text-align: center;">2015 – present</p> <p style="text-align: center;">2010– present</p>

Irina Kuzmina-Merlino	<ul style="list-style-type: none"> - Peer review committee of International Strategic Management Conference, Turkey; - Bulgarian Association for Management Development and Entrepreneurship; Member of the Advisory Committee of the Annual International scientific conference - 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 - Programme Committee of the International Conference “Reliability and Statistics in Transport and Communication”, (RelStat), Riga, Latvia 	<p>2013 – present</p> <p>2006 – present</p>
Aleksandr Medvedev	<ul style="list-style-type: none"> - Programme Committee of the Conference “Actual Problems of Education”, Riga, Latvia - Programme Committee of the Conference “Research and technology – step into the future”, TTI Research and academic conference. 	<p>2012 – present</p> <p>2012 – present</p>
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” 	<p>2011 – present</p> <p>2011 – present</p> <p>2016 - present</p>
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 	<p>Since 2017</p> <p>Since 2016</p>
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 	<p>Since 2017</p>
Ishmuhametov Ishgaley	<ul style="list-style-type: none"> - 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 - 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 	<p>Since 2017</p>

5.3. Prizes awarded to researchers, honors and scientific positions of trust

Table 5.3 Prizes awarded to researchers, honors and scientific positions of trust

Name	Prize, position etc.
Anohins Dmitrijs	1st place in Competition “Information technology: knowledge and practice” of Riga Technical University development (RTU) found, JSC Exigen Services Latvia and Accenture Latvia for the Latvian Higher Educations Institutions’ Bachelors and Master works in the field of Computer Science (Information Science).
Boriss Mishnevs	Nomination by Latvia for UNESCO Award

We are proud to announce that the Latvian National UNESCO Commission has voiced its support for Boris Mishnev, Dr. Eng., Professor of the TSI Transport and Telecommunication Institute, for his contribution to the development and improvement of training methods, information resources and increasing their availability. Professor B. Mishnev has been officially nominated by the Latvian Ministry for Education and Science for the King Hamad bin Isa Al Khalifa 2017 Award.

Having examined the professional and scientific activity of the professor, the Latvian National UNESCO Commission noted the support and substantial contribution by the professor to the creative use of IKT with a view to increasing the availability of quality training. Specifically, Professor Boris Mishnev acted as chair of the ERASMUS+ Project for the Introduction of Distance Assessment of Competences in Software Development for Graduates of Master Studies, resulting in the development of methodology and multifunctional Internet portal SECEIP which helped improve the methods for assessing training results, efficiency of use of information resources, and increase their availability. Moreover, in addition to participating actively in lecturing, the professor has been contributing, on a regular basis, to studies in the field of new online digital training technologies, particularly in the field of assessment of competencies, which forms an integral part of the process of improvement and promotion of higher education.

Considering the foregoing, the Latvian National UNESCO Commission has announced its decision to nominate Professor Boris Mishnev, Dr. Eng., for the King Hamad bin Isa Al Khalifa 2017 Award.

5.4. 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 TTI Research & Development program is support and knowledge sharing for business. R2B connections and communications is supported by participation of TTI Research/Academic Staff in business company’s scientific advisory boards.

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

Table 5.4 TTI Staff membership

Name	Tasks	Period
Igor Kabashkin	Scientific supervisor of Latvian Centre of Competence in Transport, Energy and Manufacturing	2015 - present
Irina Yatskiv	External expert in Association of Paneuropian Coach Terminals	2014 - present
Alexander Grakovski	Member of Council of expert working group of the electronic communications sector (Latvian Ministry of Transport)	2009 - present
Aleksandr Medvedev	Telemātikas un loģistikas institūts Ltd. – board member	2014 – present
	Aviation Research Center Ltd. – board member	2014 – present

6. SUBMITTED PROJECTS (INTERNATIONAL/NATIONAL)

Table 6.1 Submitted Projects

Application	Type of project/programme
Nontraditional regression models in transport modelling	National project
Spatiotemporal urban traffic modelling using big data	National project
Integrated Model for Energy Generation, Distribution and Management	National project
Innovation voucher support services procurement	National project
Importance of the national policy in development of the transport infrastructure within context of sustainable bioeconomy	National project
Sci-Bi: Digitalization in Logistics and Transport (application submission to project Competition 2018 of the Baltic-German University Liaison Office)	International cooperation
SUNGRID	LV-LT-BY
SUMMIT (Leader “Terraspatium”; CERT) MG7.1)	H2020 MG 7.1
ASPIRE (Leader CERT, MG 7.3)	H2020 MG 7.3
TISSUM	H2020 MG 7.1
OPPORTUNITIES	H2020 MG 2017
KAAT	ERASMUS+ KA2
SYW	ERASMUS+ KA2

7. FINANCING FOR RESEARCH WORK

Table 7.1 Financing

FINANCING	Amount EUR without VAT (21%)
Financing for research work	523 154
National budget financing	221 390
Revenues from contract work with another Latvia for legal entities	1 650
Foreign financing (financing received from international organizations or international organizations contract basis, payments received from abroad on research activities)	260 235
Other funding for scientific work together: References from conferences, seminars, etc.	39 879