



# ROSDORNII

**Leading Scientific-  
Research Institution  
of Russian Road  
Industry**











ЭСКАНДОР

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## History of FAI «ROSDORNII»

1959

As part of the Main Directorate of National Highways (Gushosdor of the RSFSR), the Central Scientific Research Laboratory has been established to conduct surveys on reliability of road structures

1960

First mobile laboratories were one PAZ-652 bus and two Moskvich-423 cars, with measuring equipment

1969

The State Road Design and Research Institute (GiprodorNII) of the Ministry of Construction and Operation of Highways of the RSFSR is organized.

1974

In order to accelerate deployment of of scientific research results in practice, the Ministry of Transport of the RSFSR establishes a design and technology trust «Rosdortehstroy» which carries out inspections and develops bridge repair projects.

1988

On the basis of a scientific unit of «GiprodorNII» and «Rosdortehstroy», a scientific and production association «Russian Road Research Institute» (NPO RosdorNII) appears, which includes 10 centers in different cities. In addition to carrying out scientific activities, the institute carried out design and technological work and participated in practical implementation of its own products.

1994

Transformation of the NPO RosdorNII into a state enterprise with the same name.

2006

RosdorNII receives a federal state unitary enterprise status.

2014

Transformation into a federal state budgetary institution.

2015

By an order of the Ministry of Transport of the Russian Federation a successfully operating Federal Autonomous Institution «ROSDORNII» was established, which is engaged in development and scientific support of federal, target and regional programs aimed at innovative development and improvement of roads condition.

2019

The Industry Excellence Center on new materials and technologies for road construction, repair and maintenance has been established as part of the Institution.



## Dear colleagues and associates!

The Russian road industry has received a powerful incentive for development in recent years. Hundreds of kilometers of new highways and major interchanges are being built, largescale reconstruction and repair of existing roads is under way, fleet of vehicle is being updated and innovative transport systems are being introduced.

Modernization of road infrastructure is one of priority tasks, which is supported at the highest state level. It is obvious to everyone that sustainable development of economy, and hence the well-being of people, largely depends on quantity and quality of roads, the population mobility level.

FAI ROSDORNII's team is proud to be directly involved in these historic transformation from scientific and research development and testing of new technologies to final assessment of quality of implemented projects.

More than sixty years of history, experience and knowledge accumulated during this period, as well as technological potential, have allowed us to form a full-fledged industry excellence center on the basis of the Institution in all relevant areas of work of the road sector.

FAI ROSDORNII participates in implementation of significant infrastructure projects of transport complex, the state program «Development of Transport System», within the National Project «Safe and High-Quality Roads» and «Comprehensive Plan of Modernization and Expansion of Highway Infrastructure».



The Institution conducts research activities, develops industry regulatory and technical documents, designs and inspects roads, interchanges and bridges. We are developing digitalization in the road sector, introducing advanced technologies and materials into practice of design and construction.

We are glad to cooperate with everyone who sees interconnection of our country with a modern, high-quality and safe transport network as the main goal!

Stanislav Naboko  
CEO FAI «ROSDORNII»







Our mission is to ensure continuous qualitative development of road infrastructure through use of modern approaches and technologies.



Republic Saha (Yakutia) Office

**11** Branch Offices

**1** Territorial Units

**1000** Highly-Qualified Employees

**>50** Stationary Laboratories

**>70** Mobile Diagnostic Complexes



Far East Branch Office



# Industry Excellence Center



The Institution specializes in supporting federal targeted and regional programs of the Russian Federation aimed at innovative development and improvement of highways condition.







**Regulatory and Methodological Support of Road Industry**



**Search and Testing of New Technologies and Solutions**



**Scientific Research and Products Development for Road Industry**



**Project Support and Analytics**



**Diagnostics and Construction Control**



**Pricing and Resource Monitoring System**



**Territorial and Transport Planning**



**Ensuring Road Safety**



**Establishing Federal Platform for National ITS System**



**Digitalization of Industry and Information Technologies**



**Transport Security Assessment**



**Environmental Expertise**



**Education and Advanced Training for Industry Professionals**



**FAI ROSDORNII is a key participant of the National Project «Safe and High-Quality Roads».**

The Institution's goal is to help regions to achieve key indicators of the National Project in terms of improving user characteristics of regional and local roads as an external independent expert.

Our specialists provide support on a wide range of issues-from inspecting regional road programs to assessing quality of work performed at a particular facility.

- **Methodology and Consultations**
- **Analysis of Regional Road Programs**
- **Price Monitoring of Materials Resources, Machines and Mechanisms**
- **Monitoring of Contracting and Construction Progress**
- **Assessing Technical Condition (diagnostics) of Highways**
- **Assessing Materials Quality**
- **Scientific Support on Application of New and Best Technologies and Materials**
- **Collection and Analysis of Reporting Materials**
- **Monitoring of Federal Project Implementation Within National Project «Safe and High-Quality Roads»**
- **Reference and Analysis Materials**





# Road Industry Accelerator

The first accelerator for road industry was launched on the basis of FAI ROSDORNII in 2020. This year, the Accelerator already has been operating for the second season, which is aimed at finding and supporting innovative projects to modernize and increase road safety. Thanks to the platform, the path from an idea to its practical implementation is accelerated. Participants receive technological expertise and assessment of their projects. The best and most promising developments are being implemented in pilot regions. Based on results of pilot deployment, they are included in the List of New and Best Technologies, Materials and Technological Solutions Of Secondary Use. Customers use the List to determine the optimal materials and/or technologies in their region with the required technical characteristics.

The program allows achieving several economically important effects at once: modernization of industry, increasing scientific and technical potential by attracting young scientists and entrepreneurs, opening new industries and reequipping existing ones.



## Results

>100  
bids

14  
finalists

### 1 place

Intellectual system of accident prevention / SecurOS Soffit

### 2 place

Anticorrosive surface / Cynoferr

### 3 place

Technology of soil stabilization with furnace slag / BFB

## Directions

- Autonomous vehicles and infrastructure
- Technologies for road construction and repair
- New road surfacing materials
- Smart city artificial intelligence systems
- Road condition monitoring systems
- Pedestrian safety at night
- Tracking contractors during renovations
- Weight and dimension control
- Road equipment
- Increased productivity of road construction enterprises
- Environmental solutions
- And other technologies



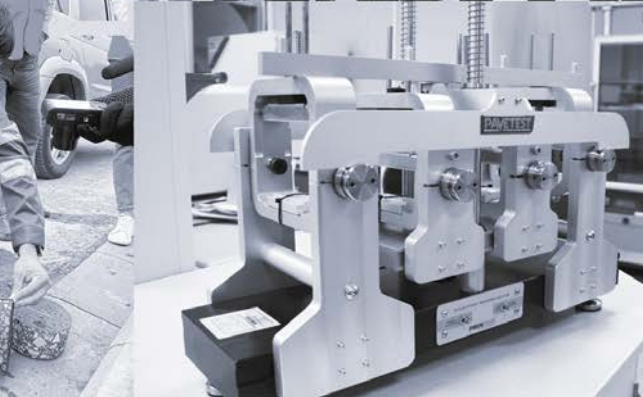
More:

# Engineering Support and Quality Monitoring





# FAI ROSDORNII is the Industry Excellence Center that performs functions of a road quality control operator at the federal level.



The Institution has an extensive branch network, a team of qualified experts, mobile and stationary diagnostic laboratories with state of the art equipment.

Technical capabilities of the Institution allow conducting audit at any stage of project implementation.

The Institute develops and operates «Doroga» automated road data bank for road industry. The completeness and integrity of the work is controlled by the Federal Road Agency through the operation control system «Dortransnavigatsiya».



More:

## Diagnostics

Diagnostics of highways condition and bridge structures are carried out by experienced specialists using mobile road laboratories with modern equipment.



### Evaluation of:

- Geometric parameters
- Longitudinal evenness
- Absence of defects in roadway or rutting
- Adhesion features

Technical condition was evaluated in all regions of the country.

From 2019 to 2021, within the framework of the National Project «Safe and High-Quality Roads», specialists of the Institution conducted diagnostics:

**145 861,540 km  
of roads**

In 2019 –

**38 405,186 km  
of roads**

In 2020 –

**61 695,222 km  
of roads**





## Quality Monitoring



Specialists of ROSDORNII and representatives of branch offices regularly go to the field and take samples for laboratory tests.

- Conclusions for Test Results
- Unified and Centralized Approach to Implementing Road Quality Monitoring
- Revealing Systemic Problems, Affecting Quality of Roadworks.

## ★ Quality

High level of quality control allows customers to acquire timely and reliable information about the situation at facilities.

**>600**  
monitoring  
units



# Technical Equipment



## Testing Complex «Ciclos»

Accelerated testing of road designs at dedicated sections by a complex, equipped with measuring systems to monitor road pavement condition. A test section length is 4 m. Imitation of 75 000 wheel runs per day, 2500 000 per month.



## Mobile Laboratory «Escandor»

High-speed non-stop diagnostics of roads by six parameters simultaneously: surface slopes, turning angles and curve radii, rut depth and profile, pavement adhesion properties, defects assessment, condition of pavement elements. Productivity - 400 kilometers per day.



## Mobile Diagnostics Laboratories

Measuring geometric parameters of roads, assessing evenness and rutting of road surface, recording and identifying types of road surface defects, assessing road pavement strength, collecting GPS coordinates, video recording.



## Mobile Laboratories for Road Digitalization

Obtaining a set of interrelated data to form a spatial digital road model and assess its condition and operational parameters.



## Stationary Laboratories

A full range of testing of road building materials using almost 500 types of measuring equipment. Testing of mastics, sealants, as well as geosynthetic and anti-icing materials.



## «Cyclos» Wheel Load Simulator



FAI ROSDORNII carries out work on deployment and development of accelerated testing methods for road pavements in the Russian Federation. The strategic task of accelerated testing methods is to find the most economically efficient and durable structures or materials for pavements within a reduced period of time compared to the actual service life.

At present, comisioning of «Cyclos» wheel load simulator has been carried out. Measures are being taken to construct the road test complex facilities, as well as to register intellectual property rights and to enroll Cyclos into the state register of measuring instruments.

By using several test sections with sensors, it is possible in a short time to assess real

performance of all road layers. After completion of work on introduction of accelerated test methods on the basis of a road testing complex, it will be possible to conduct tests within research and development work, as well as validation of new innovative materials for road construction.

**The testing complex can simulate 75,000 wheel travels per day, up to 2,500,000 per month. The test section is 4 meters long and the load range varies from 2 to 6.5 tons.**



Science. Innovations. Standartization.







**FAI ROSDORNII**  
throughout its history  
has been engaged in  
pure and applied  
scientific research in  
road construction.

**The Institution has  
unique knowledge  
and expertise.**

Our specialists study the best practices and innovative technologies from around the world, develop approaches to the introduction of the latest materials and work methods, analyze and systematize results in a dedicated list.

The regulatory and technical base of the road industry is constantly monitored. New and existing methods, standards, regulations and recommendations are being established and updated on a constant basis.

All this work is aimed at creating conditions for progressive development of road infrastructure, shaping a modern, high-quality and safe transport network.

## R&D

FAI ROSDORNII scientists are actively engaged in research, development and technological work (R&D). The main efforts are aimed at supporting the National Project «Safe and High-Quality Roads».

>460

R&D have been carried out since 1992

R&D topics correspond to main directions of technical policy pursued in road sector, as well as priority research projects.

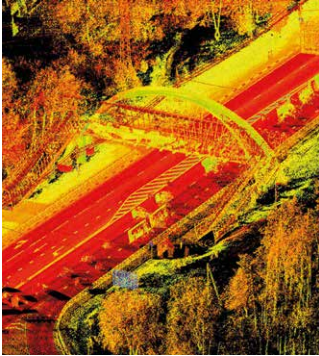
- Increasing durability of road structures and quality of road building materials;
- Creating modern research facilities;
- Digital transformation of road economy, including technology infrastructure for highways and an ecosystem of interconnected services;
- Road safety improvement;
- Development of intelligent transport systems, including for ensuring safe traffic of highly automated vehicles;
- Transport planning;
- Development of high-precision research equipment;
- Expert and analytical support of road sector;
- Improvement of regulatory and technical basis.





## Digital Models of Road and Airport Infrastructure Important Facilities

Inspection of transport infrastructure facilities using new technologies for modeling relief, situation and road structures.



## Digital Road Model

More than 10.5 thousand km of federal roads were digitalized. For this purpose requirements were developed for unique mobile road laboratories that simultaneously perform laser and GPR scanning. Digital modelling will help improve work quality and ensure normative condition of roads and create infrastructure for self-driving cars, reduce travel time, ensure a high level of comfort and improve traffic safety.



## Placement Principles for Surveillance Cameras

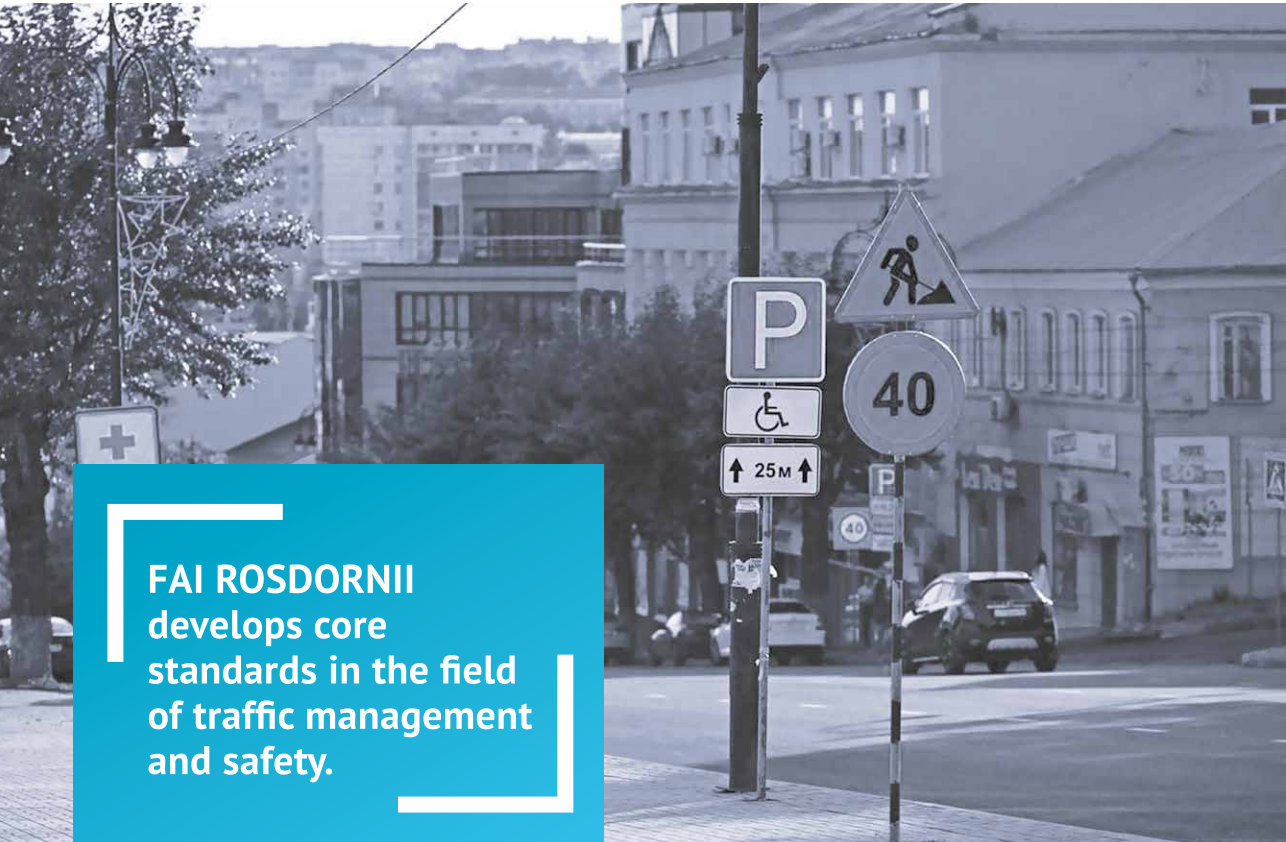
Methodological recommendations state that cameras should be installed openly to inform drivers about the possibility of fixing traffic violations, and also indicate the need for mandatory placement of information about places of their installation on publicly available information resources.



## Ensuring Safe Movement of Highly Automated Vehicles

More than 8 research projects have been completed to integrate highly automated vehicles (VATS) into the existing transport system. More than 130 VATS field tests have been carried out. A research has been carried out in terms of ensuring safe movement of VATS and interaction with intelligent road infrastructure. Requirements for accuracy of data for creating a dynamic digital road map are determined, the maximum data error is estimated, and necessary corrections for movement of dynamic objects in real time are calculated for building a digital model of a road in order to organize traffic of VATS.

# Traffic Safety and Management



**FAI ROSDORNII**  
develops core  
standards in the field  
of traffic management  
and safety.

The standards being developed in the field of road traffic management and safety are the main documents on standardization, which guide all designers of complex traffic management schemes, state control and supervisory bodies working in the field of road safety.

Most of the standards are included in a list of standardization documents, mandatory application of which ensures road safety (order of the Government of the Russian Federation from 04.11.2017 No. 2438-r).



**10** national standards

**15** international standards



# Special Inspections of Transport Infrastructure Facilities



Carrying out special inspections of transport infrastructure facilities to establish causes of deformation of road (airfield) structures and disruptions of roadbed stability, substantiate design solutions within the framework of major repairs and reconstruction, as well as control quality and volume of road construction work performed. Preparation of proposals for the elimination and further prevention of deformations and destruction.

## Inspection methods:

- Geophysical
- Geodetic
- Destructive
- Laboratory tests

## Under control:

- Geometric parameters of subgrade and road surface
- Thickness and uniformity of pavement layers
- Uniformity of material properties of pavement layers, subgrade soils and natural foundation



## List of New and Best Technologies

Since 2019, FAI ROSDORNII has been keeping the List of New and Best Technologies, Materials and Technological Solutions of Secondary Use, created within the National Project «Safe and High-Quality Roads».

The List has a wide range of applications. It is a set of ready to use effective solutions for increasing strength of road pavements, energy and resource saving technologies, reusing materials, improving road safety, and digital technologies.

The List can be used by everyone who works in road industry or is interested in its development. In addition to technical documentation and a description of solutions used, the List contains a complete inventory of information necessary for their inclusion in design and estimate documentation.

The procedure for entering technical solutions into the List assumes their comprehensive examination for compliance with industry standards.

The Institution's specialists carry out complex information processing, analyze results of technologies, materials and technological solutions deployment.

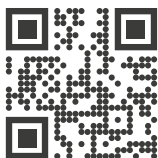
With support of the List, we plan to achieve a target of the National Project, according to which the share of facilities using new and best technologies should be 40% by 2024.



# РННТ

НАЦИОНАЛЬНЫЕ  
ПРОЕКТЫ  
РОССИИ

БЕЗОПАСНЫЕ  
КАЧЕСТВЕННЫЕ ДОРОГИ



More:

List includes:

**614** regulatory documents

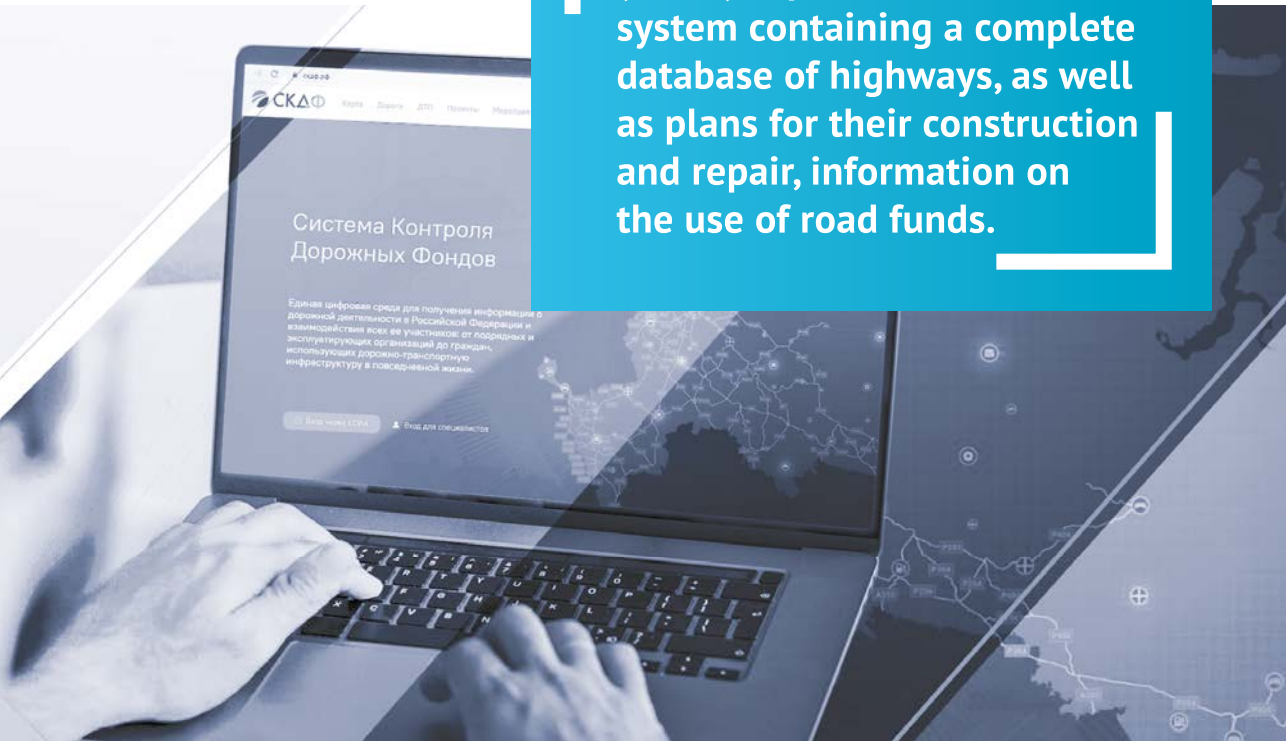
**787** materials

**360** technologies

**256** structures



**Road Funds Control System (SKDF) – public information system containing a complete database of highways, as well as plans for their construction and repair, information on the use of road funds.**



The database is constantly growing and updating. FAI ROSDORNII specialists regularly collect and digitize information about quantity and condition of highways. On its basis, analytical and statistical reports are automatically generated.

The system makes it possible to make process of movement and spending of funds in the road industry as transparent and accessible as possible for control by the state, business, public organizations and citizens.

The SKDF provides data on sources road funds raising with details on income and expenses, composition of road works, their cost, schedule and efficiency, contractor companies and contracts concluded with them.



**Key Element for  
Single Digital Space  
of Road Activities**



More:

# Digitalization and Transport Planning





**Development of territory without modern transport infrastructure is impossible today. For residents of large cities and small settlements, issues of mobility and transport accessibility are priorities, since they have a significant impact on their quality of life.**

Creation of conditions for convenient and safe movement of population is one of the main tasks set for all regions. Transport planning tools are designed to assist.

They make it possible to ensure a rational distribution of traffic flow, reduce road congestion and reduce number of traffic jams and accidents.

To develop efficient transport systems, ROSDORNII uses state of the art techniques and software. We have unique experience, we constantly monitor development of this area, we consolidate data from regions and provide them with consulting support in solving practical problems.



# Transport Planning



## Tasks and Goals:



Economic justification and improvement of investment efficiency in transport infrastructure.



Improving quality of transport services for population, forming a unified multimodal transport system.



Increasing speed and reliability of transport communications, reducing loss of time in congestion.



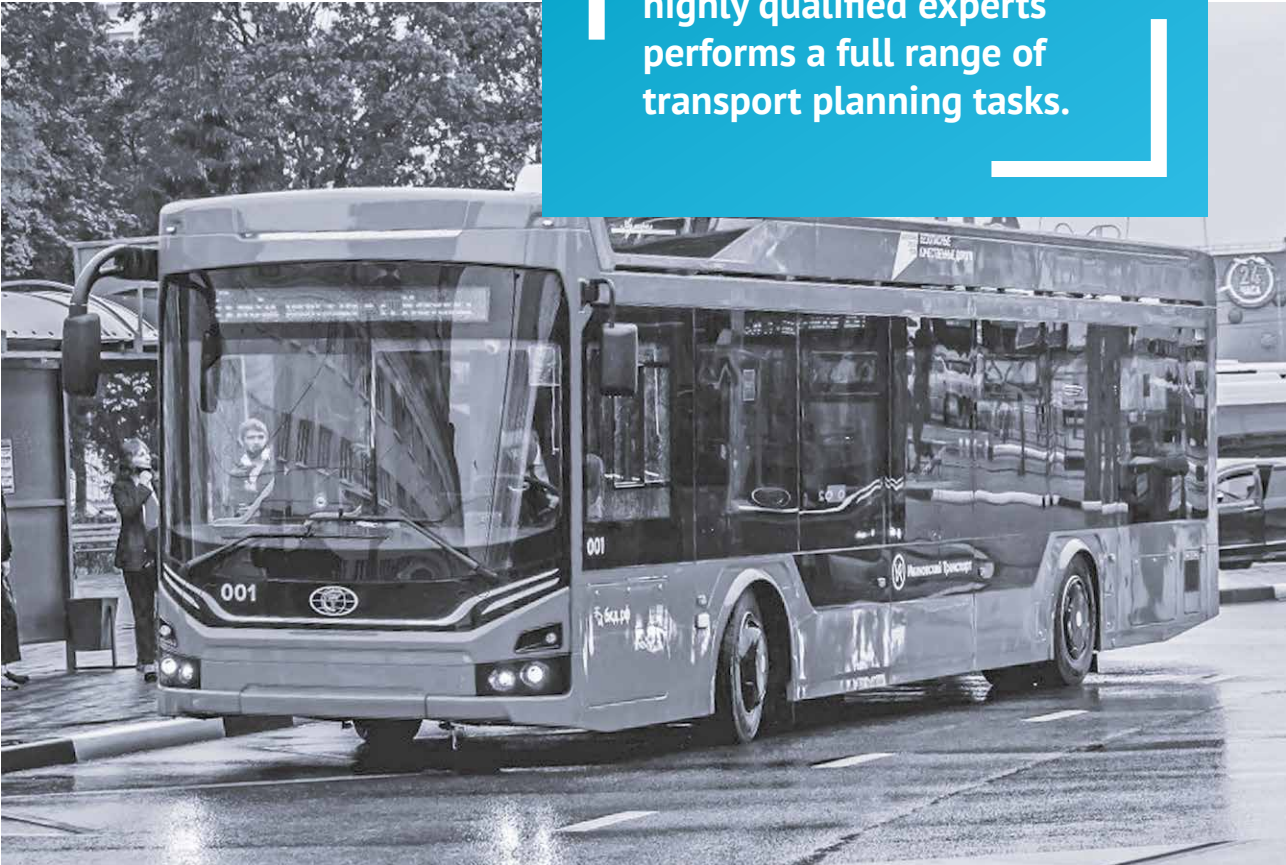
Selection and justification of the most effective measures for transport infrastructure development, traffic and transport services management for population.



Eliminating black spots, reducing the number of road accidents and severity of their consequences



FAI ROSDORNII's team of highly qualified experts performs a full range of transport planning tasks.



Study of local transport system operation

Development of transport planning documents for regions and cities

Integrated Development of Transport Infrastructure Programs (PKRTI)

Comprehensive Scheme for Managing Public Transport Services for Population (KSOT)

Comprehensive Traffic Management Scheme (KSODD)

Examination of previously developed transport planning documents

Development of transport macro- and micro- mathematical models

Analysis and optimization of public transport route networks

Development of traffic management projects

Certification of highways and streets

Feasibility study of the need to build new highways or electric transport lines

# Intellectual Transport Systems

Development of ITS is an important component of transport industry digital transformation and projects of «smart cities».

## The Institution Develops Concepts of National ITS Network.



The main tasks are to increase efficiency of road network, create a mechanism for managing transport system in real time, increase quality of transport services for population, reduce costs, improve environment protection and safety.

- Implementation of technical requirements and standards for road infrastructure by using digital technologies
- Examination of projects for ITS design
- Scientific, methodological and consulting support of work on shaping a national ITS network
- Implementation of a promising standardization program in the field of ITS
- Methodological support for the creation and maintenance of digital infrastructure
- Survey of territories and their current transport schemes



**Synergy of modern information and telematic technologies allows ITS to perform automated search and select the most effective scenarios for managing transport and road complex of a territory.**



# Weight and Dimension Control

FAI ROSDORNII develops methods and technologies for ensuring road safety.



- Carrying out researches aimed at improving regulatory framework of compensation for damage caused by heavy vehicles to roads.
- Methodological support to development of a network of automatic points of weight and dimension control for vehicles (APVGK).
- Carrying out researches to assess condition of highways to prepare proposals and develop recommendations for planning activities for maintenance, repair, overhaul and reconstruction of highways.
- Scientific and technical support to requirements development for regulatory framework in the field of axle load sensors and axle load monitoring systems on freight vehicles.
- Carrying out researches aimed at developing a methodology for determining a period of seasonal decrease in bearing capacity of structural elements of a highway, as well as characteristics of provisional limitations.
- Development of special projects for passage of heavy and (or) large vehicles, including assessment of vehicle and cargo characteristics, technical conditions for road infrastructure along the route and preparation of measures to ensure safe passage.



## Construction Control



ROSDORNII has all necessary resources and technical means to carry out comprehensive supervision over road construction works quality.

### ★ Result

Compliance of performed works, applied materials and project documentation with current standards and terms of contracts.

**50**  
contracts  
executed



Internal Inspection Control of Effectiveness of Work Implementation.



Specialists Supervise Facilities Every Day.



Incoming, Operational and Commissioning Inspection.



# Economic Studies





**FAI ROSDORNII is a  
flagship institution  
carrying out  
industrywide activities  
in the field of road  
economy.**

Our specialists study market of materials and equipment required by the industry on a systematic basis.

The Institution conducts applied-scientific, technical and economic researches to improve methods of construction and maintenance cost management for road facilities and also develops appropriate regulatory, legal and methodological documents.

On the basis of the consolidated information, a unified policy is formed on the issues of spending funds for development, repair and operation of transport infrastructure.

Centralization of information about economic activity, together with an extensive scientific and methodological base, allows to optimize process of road works planning and increase their quality.

## Pricing

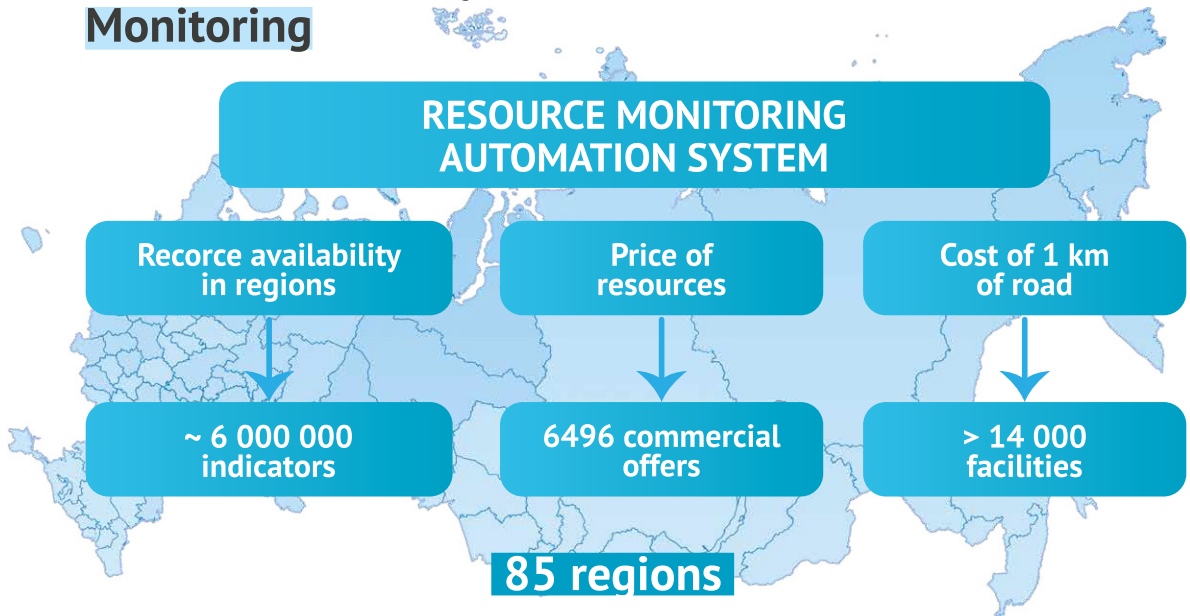
Improving the pricing system for transport infrastructure is one of priority areas of FAI ROSDORNII's work.

The pricing department of FAI ROSDORNII carries out tasks on developing and improving the pricing system and estimates rationing, taking into account directions determined by the Government of the Russian Federation, as well as federal executive authorities, in the field of:

- **Development, scientific and technical support of coordination and approval by federal executive authorities of projects and estimated standards in the road sector;**
  - **Monitoring cost of construction resources for calculating conversion indices taking into account the transportation component;**
  - **Education/advanced training for road workers**
- **Carrying out economic research in road industry in the following areas:**
    - Changes in construction cost of 1 km of roads
    - Monitoring availability of main pricing materials of road industry in regions, including conducting a study of market microeconomics in the construction sector
  - **Deployment of information technologies with the integration of the pricing system, as well as automation of construction resource monitoring.**



## Resource Availability Monitoring



Monitoring of current prices of construction resources, resource availability in regions, cost of construction, reconstruction, overhaul, repair and maintenance of 1 km of road in each region allows conducting market researches in the construction sector.

For development of monitoring processes and obtaining analytics of a new level, it is planned to carry out automation, which will allow:

- **To obtain the most reliable (market) information on cost of construction resources**
  - **To collect information on types of work and purpose of a road;**
  - **To gain an industry advantage in the form of a proven expert position in terms of estimated price indicators.**
- **Create and save publicly available analytical monitoring databases in the context of three directions:**
    - Price of construction resources in the Russian Federation regions;
    - Production and consumption of construction resources by the Russian Federation regions;
    - Availability of information on cost of 1 km road construction.

# EDUCATION



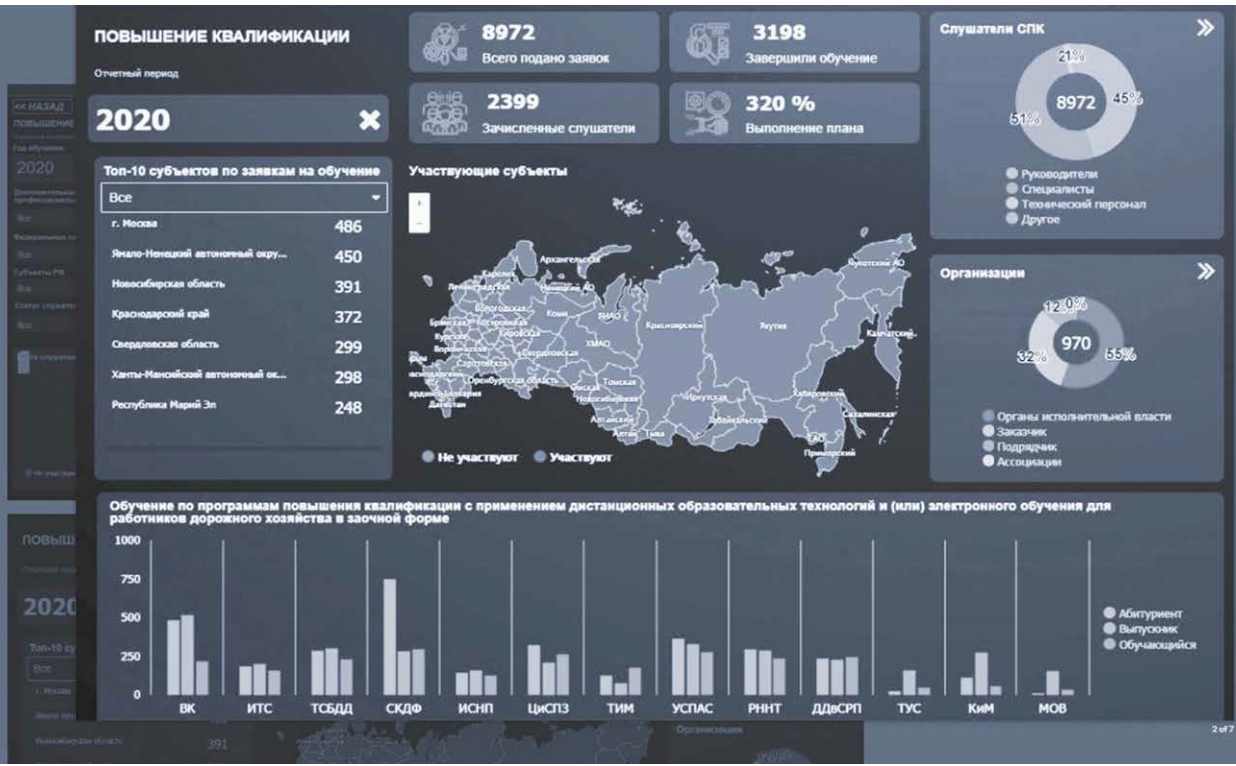
**ROSDORNII is the developer of the system of advanced training for road workers within the National Project «Safe and High-Quality Roads».**

Our specialists have developed various training programs on the most pressing issues of the industry, which we provide for the regions in person and virtual format.

The advanced training system includes training programs in the field of information modeling technologies (TIM) of the road industry.

In addition, FAI ROSDORNII specialists every month conduct free webinars, consultations and seminars on relevant issues of road facilities for all categories of road workers.

# Advanced Training



On the educational portal of the road industry and the website of the Advanced Training System, you can find training materials, methodological manuals, regulatory legal acts and comments to them, articles and much more.

More than 3,600 people took part in educational and informational events held by FAIROS DORNII. Advanced training courses were passed:

- in 2019 – 1440 by people
- in 2020 – 3198 by people

**>4600** trainees

**27** additional professional programs

**>50** expert professors

Educational Portal of Road Industry





## Science and Technology Policy

FAI ROSDORNII deals  
with technical regulation  
and standardization in the  
field of road industry.



We analyze practice of applying standards included to Technical Regulations of the Customs Union «Safety of Highways» TR CU 014/2011 within framework of the National Project «Safe and High-Quality Roads».



We interact with various technical committees for standardization, on issues of technical regulation and standardization within framework of the National Project «Safe and High-Quality Roads».



We carry out an examination of standards of organizations and prepare conclusions for them enrolling in the List of New and Best Technologies, Materials and Technological Solutions of Secondary Use».



On a commercial basis, we provide services for development of standards of organizations in order to introduce innovations and the best technologies, materials and technological solutions of secondary use.

# We Always Find Solution

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