

## Results of the business unit's investment programme in 2015

The Central Infrastructure Directorate fully utilised its budget of RUB 87.6 bln in 2015. The bulk of the funds were spent on the track reconstruction (modernisation) programme. As a result, RUB 70 bln worth of work was performed to rebuild (modernise) tracks.

As part of the investment programme, work valued at approximately RUB 65.2 bln was performed under the federal programme to develop the Eastern operating domain.

The amount of fixed assets put into operation as part of projects of the Central Infrastructure Directorate totalled RUB 85.8 bln in 2015, a 0.6% increase versus the target.

Spending by the Central Traffic Control Directorate totalled RUB 3.2 bln in 2015. The main project was the 'Construction of Secondary Tracks, Extension of Station Tracks and the Development of Railway Hubs and Border Stations', on which RUB 1.9 bln was spent. The Directorate's investment programmes above all aimed to increase the carrying and processing capacity of the main railway network routes

and improve the reliability of operations by branches.

The amount of fixed assets put into operation as part of projects of the Central Traffic Management Directorate totalled RUB 8.3 bln in 2015, a 44.5% increase versus the target.

Spending of investment funds by the Traction Directorate totalled RUB 68.2 bln in 2015, or 0.9% less than the target (plan of RUB 68.8 bln), including RUB 59.9 bln spent on the investment project 'Purchase of Traction Rolling Stock' (0.4% below the plan), which aims to purchase 500 locomotives.

# 100.6 %

**execution of the plan for commissioning fixed assets under the Central Infrastructure Directorate's projects in 2015**

## Measures to improve the efficiency of the business unit

Eliminating infrastructural constraints and increasing carrying capacity are among the priority objectives of the business unit's activities. Track repair work was carried out on 5,021 km of tracks in 2015 (100% of the annual plan), including the reconstruction (modernisation) of railway tracks on 2,814 km (100% of the annual plan).

The track improvement work resulted in an increase in traffic speed in the operating domain on 1,100.7 km for passenger trains and on 811 km for freight trains.

In order to ensure certain sections have carrying capacity for the planned transportation volumes, restrictions were eliminated for freight trains weighing 6,300 tonnes over a section of 71 km through enhancements to power supply equipment.

As a result of a range of measures implemented by the business unit's divisions in 2015 (energy efficiency programme, renovating the locomotive fleet and introducing an optimal energy schedule for train traffic), the specific consumption of fuel and energy resources was reduced versus the 2014 level:

- by 2.0% for train traction;
- by 1.2% for electric traction.

Traction Resource Management Centres (TRMC) were completed on the network, making it possible to transition to the targeted model for managing the transportation process based on operating domain technology. The Traction Resource Management Centre Automation System

## On the path to change



**Anatoly Krasnozhchek**  
First Vice President  
of Russian Railways

*Almost 3,000 new locomotives have been purchased over the last five years, or more than over the previous 15 years. The physical wear of the locomotive fleet has been reduced on average to 68.8%. This has made it possible to accelerate the development of heavy-haul transportation. More than 4,000 trains weighing over 8,000 tonnes and 30,000 coupled trains were in operation in 2015, an increase of 10% from the previous year.*

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*In 2015, the service speed of freight trains increased to 39.1 km/h, a 3.7% increase compared with 2014.*



Based on materials from the final meeting of the Russian Railways Management Board

(TRMC AS) was developed to automate the work of the centres.

The Central Traffic Management Directorate is carrying out preparatory work to introduce operating domain management systems at the pilot Eastern operating domain within the Krasnoyarsk, East Siberian, Zabaykalsk and Far Eastern Railways.

At a meeting on 17 April 2015, the Russian Railways Board of Directors considered and approved the Programme

on the Development of a Traffic Control Hierarchy Based on Scientific and Technical Achievements, which includes both medium-term measures (for the next 3-5 years) as well as long-term measures to be implemented prior to 2030. These measures should substantially enhance traffic safety and improve the occupational safety levels by automating train handling processes and the marshalling work of stations, introducing paperless technologies and minimising the impact of the human factor.

100 % of annual plan

**5,021** km of tracks  
track repair work

## Development of heavy haul traffic in 2015

Increasing weight standards has been identified as one of the priorities for handling the growing transportation volume according to the Russian Railways Group's Development Strategy until 2030.

Trains weighing 8,000 and 9,000 tonnes are already running on the routes Kuzbass-Northwest ports and Kuzbass-Centre. There were over 4,800 trains weighing 8,000 tonnes or more in operation in 2015 (an increase of 2% versus 2014) and more than 32,800 coupled trains (up 14.6% from 2014).

As part of the implementation of the Programme for the Development of Heavy Haul Railway Traffic, a range of measures was implemented in 2015 to assess axial forces that occur in trains and their impact on the infrastructure of trains weighing over 12,600 tonnes. These measures resulted in the formation of a scientifically substantiated regulatory framework that describes the procedure for such trains to use Russian Railways infrastructure. Just over 2,600 such trains operated in 2015.

Trains weighing 7,100 tonnes formed from railcars with axle loads of 25 tonnes operated regularly on dedicated route schedules in the Eastern operating domain (just over 380 trains such trains ran in 2015).

In addition, the first stage was completed in comprehensive studies to assess the feasibility of operation for coupled trains weighing 14,200 tonnes formed from railcars with axle loads of 25 tonnes.

## Development of marshalling yards in 2015

The Company continued work in 2015 to implement the Marshalling Yard Improvement and Development Programme with a budget of RUB 1,182.2 mln.

The allocated funds were spent on track development and equipping marshalling yards with mechanical devices and systems to automate the core technological processes in order to increase the processing capacity of marshalling yards.

As part of the allocated capital investment limit and also in accordance with the updated marshalling yard development programmes, the Company performed work

in 2015 to mechanise and automate gravity humps and rebuild six marshalling yards, including:

- St Petersburg-Marshalling Moscow of October Railway (modernisation and reconstruction Fleet No. 3);
- Volkhovstroy 1 of October Railway (reconstruction of station, receiving yard);
- Losta of Northern Railway (modernisation of station, introduction of an integrated marshalling process automated control system (IMPACS));

- Kinel of Kuybyshev Railway (reconstruction of a down-yard marshalling system, Depot No. 8);
- Yekaterinburg-Marshalling of Sverdlovsk Railway (reconstruction of the station's up-yard marshalling, receiving yard and gravity hump);
- Chelyabinsk-Main of South Urals Railway (modernisation and an integrated automated control system for the down-yard marshalling system).

In April 2015, October Railway hosted an enlarged meeting of the Russian Railways Scientific and Technical Council's System Transportation Problems subpanel devoted to the development of marshalling yards in the period until 2025 at which the decision was made to select Luzhskaya station as a pilot test site to refine the innovative technologies of marshalling yards such as:

- automatic shunting technology developed by Siemens AG with the

automated control of the shunting locomotive that provides for automatic switching integrated with a Russian marshalling yard automated control system and linked to domestic interlocking systems and the automated locomotive signalling shunting system (ALSSS);

- automated rolling stock and commercial inspection diagnostic systems;

- unmanned train assembly technologies;
- automated transport hub control system and electronic document technology in the transportation process.

## Dynamics and structure of the traction rolling stock fleet in 2015

At the end of the year, the locomotive fleet of the Russian Railways Group in operation was comprised of 12,696 units, including:

- in freight traffic – 6,442 units;
- in passenger traffic – 1,378 units;
- in utility traffic – 1,644 units;
- in special shunting and other shunting operations – 3,184 units;
- in other operations – 48 units.

At the end of the reporting year, the working locomotive fleet of the Russian Railways Group was comprised of 8,438 units, including:

- in freight traffic – 4,798 units;
- in passenger traffic – 728 units;
- in utility traffic – 545 units;
- in special shunting and other shunting operations – 2,336 units;
- in other operations – 31.

Russian Railways purchased 500 locomotives in 2015 (99.6% of the plan), including:

- 275 electric locomotives, including 43 passenger and 232 freight locomotives;
- 225 diesel locomotives, including 15 passenger, 92 freight and 118 shunting locomotives.

Seventeen of the 500 new locomotives are innovative.

The increase in the purchase of locomotives is already producing positive results in terms of the reduced wear of the locomotive fleet. Overall, the physical wear of the locomotive fleet has been cut to 68.8% on average.

## Measures to improve the utilisation efficiency of locomotives

One of the strategic areas of work for locomotives is the renovation and unification of the locomotive fleet by operating domain.

New locomotives are distributed in accordance with the operating domain method. The supply of new locomotives makes it possible to gradually get rid of the locomotive fleet in operation and redeploy it to railway operating domains that have increased freight turnover as well as retire the fleet that has exhausted its standard service life.

A total of 566 locomotives were relocated throughout the Russian Railways network in 2015, including 309 electric trains and 257 diesel trains.

The following work was carried out in 2015 to improve the efficient use of locomotives:

- the ability to operate coupled trains weighing 12,600 tonnes on the Maykop-Belorechenskaya domain of North Caucasus Railway was confirmed. Testing approved the Temporary Instructions for Organising Coupled

Trains Weighing 12,600 Tonnes on the Public Railway Tracks of Russian Railways;

- freight trains weighing 9,000 tonnes were put into operation on the Kuzbass-Northwest domain with 2 route schedules as a result of the supply of 3ES10 electric trains;
- operating technology for diesel freight trains was optimised on the Baikal-Amur Mainline and freight train weight was increased by 700 tonnes from

4,900 tonnes to 5,600 tonnes due to the supply of 51 Vityaz 2TE25A diesel locomotives. Given that Vityaz 2TE25A diesel locomotives have asynchronous traction drive and motor-axle roller bearings, this made it possible to increase the run between TO-2 from 72 to 96 hours;

- 2x2E55K electric freight trains weighing 7,100 tonnes were put into operation on the Inskaya-Tayshet-Smolyaninovo section merged into four sections;
- freight trains weighing 6,300 tonnes were put into operation on 2 route schedules using 2x2TE10 diesel locomotives on the Volochayevka-2-Komsomolsk section;
- traction energy testing was conducted on the operating domain of Far Eastern

Railway to determine the operational feasibility of coupled freight trains, which made it possible to ensure their operation during track repair work.

- 3TE10MK diesel locomotives weighing up to 9,800 tonnes were put into operation on the Volochayevka-2-Komsomolsk-on-Amur section,
- 3E55K electric locomotives weighing up to 12,000 tonnes were put into operation on the Belogorsk-Khabarovsk-2-Shkotovo section,
- 2TE25A and 3TE10MK diesel locomotives weighing up to 11,200 tonnes were put into operation on the Khani-Tynda-Novy Urgal section;

- the operating domain of the EP2K electric locomotives was expanded to the station of Samara and Kartaly of Kuybyshev and South Urals Railways by 1,004 km (from 1,802 km to 2,806 km).

## 500 locomotives

(99.6 % of the plan) purchased by Russian Railways in 2015

### Development of effective technologies to manage the freight car fleet in 2015 given the large number of rolling stock operators. Results of the introduction of SNOP for railway freight transportation

Russian Railways works consistently to implement the provisions of the Single Network Operating Procedure (SNOP) insofar as it does not require changes to the regulatory legal framework when organising the transportation process.

At present, the SNOP is used when solving problems involving effective interaction between the Company's functional branches, including the technical regulation of the transportation process, train traffic control technologies, the work of locomotives and locomotive crews and the provision of information on production activities.

This work has resulted in positive trends in key rolling stock utilisation indicators. A total of 32,800 extended trains were dispatched on the railway network in 2015, a 14.6% increase from 2014.

Utilising the technological tools specified in the SNOP improved the freight train schedule execution level, including by 2.9 percentage points for dispatches and 12.9 percentage points for passage.

The SNOP is also used when implementing the Integrated Programme for the Phased Transition to the Organisation of Scheduled Freight Train Traffic. In order to develop

freight train traffic technology according to specialised schedules, the goal was set of dispatching 400 specialised freight trains daily starting in January 2015.

In 2015, 116,800 trains (320 trains per day) were dispatched via exit routes from mass loading stations according to specialised schedules. The dispatch of freight trains according to specialised schedules increased 76% in 2015 compared with 2014. The schedule for specialised trains was met at a rate of 98% for dispatches (+3% compared with 2014) and 42% for travel (also +3% versus 2014).

## Repair and modernisation of infrastructure facilities in 2015

In terms of track facilities, reconstruction (modernisation) of railway tracks was carried out on 2,814 km (100% of the annual plan) and 1,283 turnouts were built (100% of the plan). Total spending on track reconstruction (modernisation) amounted to RUB 70.2 bln at the expense of the investment budget (100.2% of the plan).

The funds for major track repairs were used to perform the following work:

- major repairs of used materials on 829 km (103.6% of the plan for RUB 7.0 bln);
- 2,186 turnouts built (101.2% of the plan for RUB 3.6 bln);
- average railway track repairs of 1,365 km (101.4% of the plan for RUB 3.8 bln);
- rail replacement work for 1,911 km (100.6% of the plan for RUB 4.4 bln).

Total spending on major repairs amounted to RUB 22.1 bln (100.1% of the plan).

Major repairs were carried out on engineering structures valued at RUB 3.3 bln (99.8% of the plan). A total of 129 engineering structures (bridges, pipes and tunnels) and 27.0 km of roadbed were repaired.

In automation and telemechanics, RUB 3.5 bln in funds for major repairs of railway automation and telemechanics equipment were spent in full.

Repairs were conducted on:

- 846 km of the automatic block system;
- 1,223 electric interlocking switches.

The Automation and Telemechanics Office spent RUB 3,797.86 mln of the allocated funding limit of RUB 4,630.8 mln, or 82% of the annual plan, on nine investment projects in 2015. The failure to fully utilise the investment budget resulted from the termination of relations with Italy's ECM s.p.a. as well as an adjustment to the list of facilities and the late issuance of their design and estimate documentation.

Spending as part of the investment budget for electrification and power supplies totalled RUB 5.0 bln in 2015, or 98.8% of the annual plan. For the year, the following major work was performed:

- reconstruction of 133.1 km of installed contact network;
- renovation of 88.7 km of high-voltage power supply lines to the automatic block system;

- installation of 103.3 km of suspension cable and 83 km of line feeder;
- installation of 1,733 new contact network supports and 1,230 substructures;
- modernisation of equipment at 12 traction substations;
- replacement of 5 telemechanics systems.

A total of RUB 4.9 bln were spent on major repairs to facilities in 2015. The following facilities was repaired:

- 2,402 km of contact network;
- 1,435 km of overhead and cable electricity transmission lines;
- 73 traction substations.

**RUB 5 bln**  
investment budget for electrification

Length of continuous welded rail tracks, including with resilient fastenings, '000 km

