



**PKP POLSKIE LINIE KOLEJOWE S.A.**

*Zarządca narodowej sieci linii kolejowych*



# Annual Report 2016



# Table of contents

<b>Foreword by the President of the Management Board.....</b>	<b>4</b>
<b>Members of the Management Board and the Supervisory Board.....</b>	<b>5</b>
<b>Financial result.....</b>	<b>6</b>
Company assets.....	6
Source of assets financing.....	8
Equity.....	8
External capital.....	8
Economic-financial results.....	10
<b>Train path sales.....</b>	<b>13</b>
Timetable as the Company's primary product.....	13
Data concerning completed international carriages.....	14
Operation systems.....	15
<b>Infrastructure.....</b>	<b>16</b>
Rail roads.....	16
Automatics and Telecommunication.....	18
Electrical power devices.....	24
Traction network.....	25
Track Machinery Plant.....	29
Diagnostics.....	30
Passenger Service Facilities.....	31
<b>Safety.....</b>	<b>37</b>
Statistics of railway events.....	37
Measures taken to improve the safety of railway traffic.....	39
Railway Security Guard.....	43
Railway technical emergency response service and fire protection.....	46
Preparing the railways for crisis situations.....	46
Safe Crossing – “Risk Barrier!”.....	47
<b>Development prospects.....</b>	<b>49</b>
General strategic framework.....	49
International and national cooperation.....	51
Strategic planning.....	51
Support for investment undertakings.....	52
Interoperability.....	53
Information Technology.....	53
Geoinformation.....	59
Environmental protection.....	60

<b>Investments</b> .....	<b>62</b>
Financial framework 2014-2020.....	62
Sources of financing.....	68
Investment Forum.....	74
<b>Human resources</b> .....	<b>76</b>
Employment analysis.....	76
Staff development.....	78
<b>External communication</b> .....	<b>79</b>
Celebration of the 15th anniversary of PKP Polskie Linie Kolejowe S.A. ....	79
85 years of the building - registered offices PKP Polskie Linie Kolejowe S.A. ....	79
World Youth Day.....	79
SAP HANA - a prestigious award in the IT industry.....	79
Official Company profile on social networking site Facebook.....	80
Contact details.....	81
Map of railway lines.....	82



**Ireneusz Merchel**  
**President of the Management Board**  
**PKP Polskie Linie Kolejowe S.A.**

*To whom it may concern,*

*It is with great satisfaction and undistinguished pleasure that I present to you our current annual report of PKP Polskie Linie Kolejowe S.A. for 2016 I am fully convinced that this document will be an essential compendium of knowledge, both for our partners, as well as for individuals who have been on a daily basis engaged in the development of rail transport. The document addresses all areas of our activity from changes in the company's structure, through the investment activities, to the development of modern technologies and timetable.*

*The year of 2016 was a period of intensive changes for for PKP Polskie Linie Kolejowe S.A. The Management Board, which I have an honour to lead, made the decision on the activities aimed to improve the functioning of the company's organizational structure. It is also the time devoted to the implementation of the investment programme for the period of 2014-2020. In 2016 the Management Board significantly accelerated the preparation of projects of the new financial perspective of the EU. The National Railway Programme includes projects for a total amount of more than 66 billion, which will realistically change the railway network in Poland and provide the expected standard of travel.*

*The past year was also a time of positive changes for travelers. The next stage of work on the route Warsaw-Łódź Fabryczna was completed. The Łódź Fabryczna station started to operate and the reconstruction of Łódź railway junction - the connection to Łódź Kaliska and Żabieniec - is underway. In 2016, PKP Polskie Linie Kolejowe S.A. ensured the smooth conduct of a significant logistics project - World Youth Days in Krakow - during which the security of passengers was among the main priorities. In practice, our activities involve hundreds of successful journeys of thousands of pilgrims and guests participating in the World Youth Days.*

*Having regard to the comfort of railway travelers, we have consistently carried out investments, which involved reconstruction of platforms while their availability and*

*comprehensive information devices have become a standard. New engineering facilities were established and together with the upgrading of level crossings and control command and signalling equipment, the level of railway network safety has raised.*

*In 2016, PKP Polskie Linie Kolejowe S.A. also continue the implementation of changes that are relevant for railway carriers. Last year, the Bielawa Dolna-Horka bridge was put into operation, which will significantly improve railway transport and safety of carriage at the intersection of German and Polish rail network. Work in the East Poland involve increasingly more efficient connections on the East-West line. The construction of a bridge over the Martwa Wisła river was also completed last year, within the framework of upgrading the railway line from the Pruszcz Gdański to the Gdańsk port. This investment brought new opportunities for freight services which will affect their competitiveness as compared to other means of transport.*

*In 2016, the Ministry of Transport established the Council of Experts, an advisory panel, with the aim to streamline the investment process. In addition to the Ministry representatives, contractors, manufacturers, carriers and independent experts, PKP Polskie Linie Kolejowe S.A. is also one of the members.*

*We should not forget that the priority for PKP Polskie Linie Kolejowe S.A., next to the implementation of the National Railway Programme, is to provide safe everyday transport of passengers, according to the timetable agreed, and the carriage of cargo on the national rail network. The implementation of these tasks is ensured on an everyday basis by the services dealing with railway traffic management, maintenance of railways, efficiency of railway network, proper operation of control command and signalling equipment.*

*I wish you a good reading of the report that covers all aspects of activity of the national railway infrastructure administrator.*

**Ireneusz Merchel**  
**President of the Management Board**  
**PKP Polskie Linie Kolejowe S.A.**

# Members of the Management Board and the Supervisory Board

## Supervisory Board

- 1. Mariusz Andrzejewski**  
Chairman of the Supervisory Board
- 2. Artur Kawaler**  
Secretary of the Supervisory Board
- 3. Piotr Gebel**  
Member of the Supervisory Board
- 4. Wiesław Pełka**  
Member of the Supervisory Board
- 5. Jan Piechel**  
Member of the Supervisory Board
- 6. Jakub Kapturzak**  
Member of the Supervisory Board
- 7. Ryszard Stopa**  
Member of the Supervisory Board

## Management Board

- 1. Ireneusz Merchel**  
President of the Management Board
- 2. Marek Olkiewicz**  
Vice President of the Management Board  
- Director for Operational Affairs
- 3. Arnold Bresch**  
Member of the Management Board  
- Director for Investment Implementation
- 4. Antoni Jasiński**  
Member of the Management Board  
- Director for Infrastructure Maintenance
- 5. Włodzimierz Żmuda**  
Member of the Management Board  
- Director for Development and Investment Preparation
- 6. Radosław Celiński**  
Member of the Management Board  
- Director for Financial and Economic Affairs

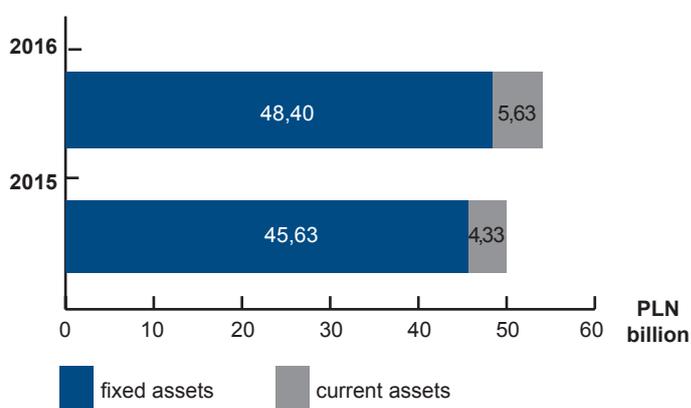
\* as of 25 September 2017

# Financial result

The Company's economic and financial situation was assessed based on financial reports representing the status as of December 31, 2016.

## Company assets

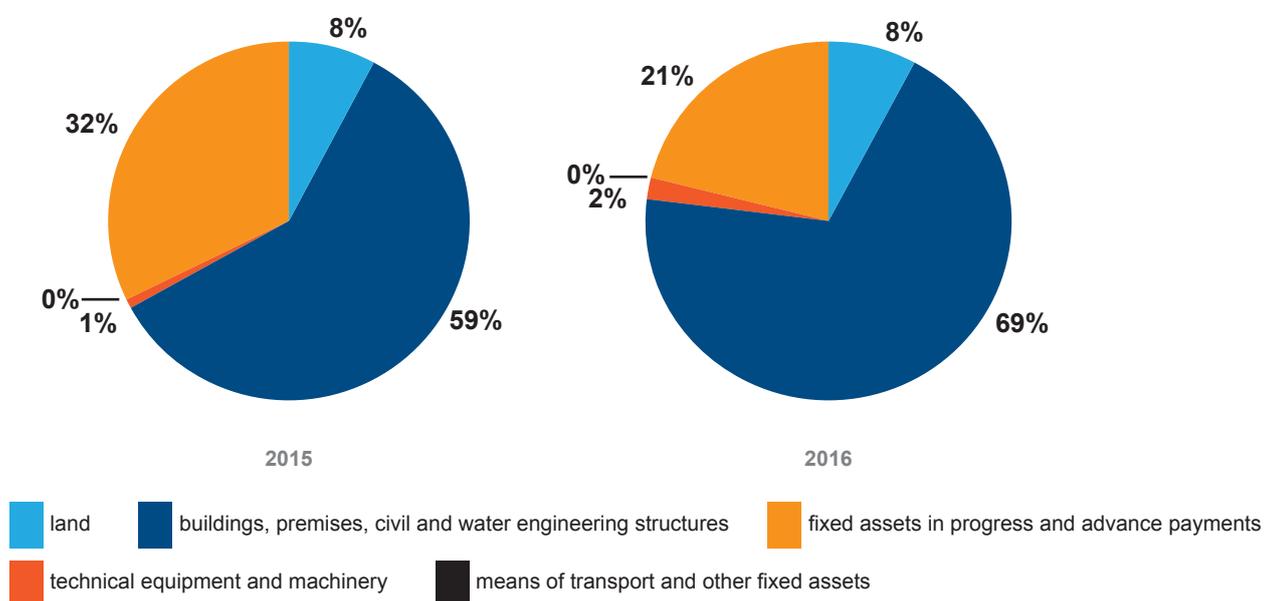
**The assets of PKP Polskie Linie Kolejowe S.A. in 2015 - 2016**



The book value of the assets owned by PKP Polskie Linie Kolejowe S.A. as of December 31, 2016 amounted to PLN 54,030.3 million and was 8.2% higher than in 2015.

The structure of what the Company owns is asset-based, which is typical for railway infrastructure managers, which mostly comprises buildings, premises, civil and water engineering structures. In 2016, the Company's fixed assets comprised approximately 90% of its total assets. Over the financial year, fixed assets grew by approx. 6%, mainly due infrastructure modernization works, i.e., investments that have been completed and commissioned on railway lines.

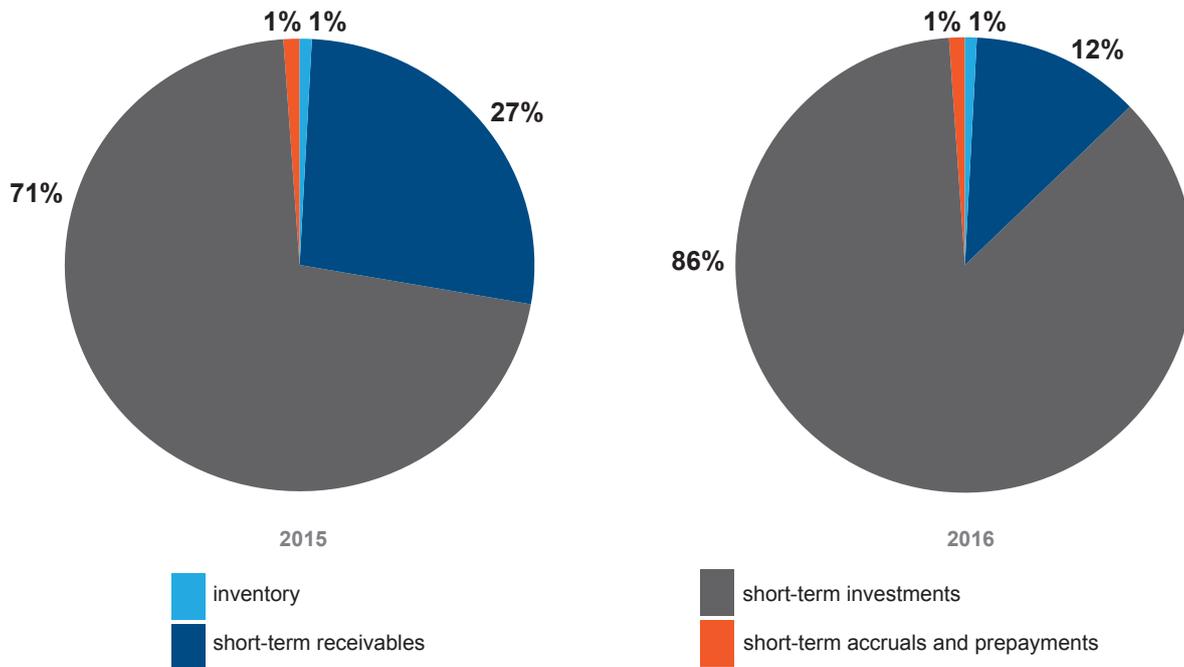
**Structure of tangible fixed assets in 2015-2016**



The current assets of PKP Polskie Linie Kolejowe S.A. in 2016 amounted to 10% of all assets. Their book value grew by 30% when compared to the year 2015. This growth has been primarily the result of an increase in funds, resulting from funds obtained from the deposits of own funds and European Union for investment projects,

including for the implementation of the Operational Programme Infrastructure and Environment (OPI&E), loans granted by the European Investment Bank (EIB) for financing and pre-financing railway line modernization and bonds for pre-financing investment projects.

**Structure of current assets in 2015-2016**



In 2016, PKP Polskie Linie Kolejowe S.A. held shares reported as long-term investments in the following subsidiaries:

1. Pomorskie Przedsiębiorstwo Mechaniczno-Torowe Sp. z o.o. with its registered office in Gdańsk (100% of shares in share capital);
2. Dolnośląskie Przedsiębiorstwo Napraw Infrastruktury Komunikacyjnej DOLKOM Sp. z o.o. we Wrocławiu (100% of shares in share capital);
3. Przedsiębiorstwo Napraw i Utrzymania Infrastruktury Kolejowej w Krakowie Sp. z o.o. (100% of shares in share capital);
4. Zakład Robót Komunikacyjnych - DOM w Poznaniu Sp. z o.o. (100% of shares in share capital);

3. respond rapidly to the need to carry out construction work in emergency situations.

In addition, pursuant to the agreement on holding shares in usufruct signed in 2014 with PKP S.A. as well as in accordance with the authorisation granted by PKP S.A., PKP Polskie Linie Kolejowe S.A. executed corporate rights resulting from 171,622 shares representing 100% of the share capital of PKP Utrzymanie Sp. z o.o.

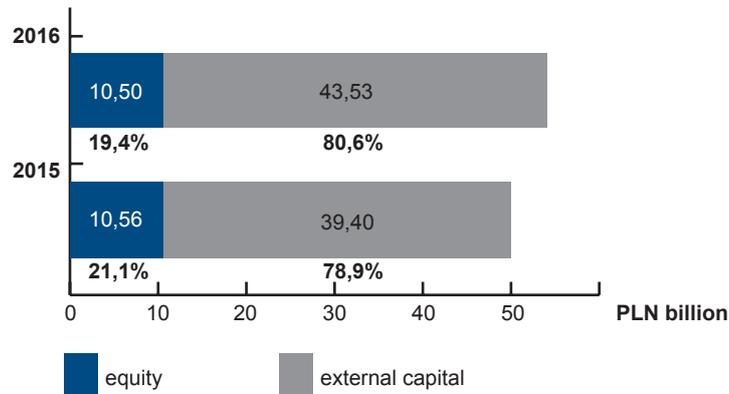
The balance value of the assets in question as of December 31, 2016 was PLN 128.2 million.

The maintenance and repair companies are the necessary potential of PKP Polskie Linie Kolejowe S.A. that is used to:

1. maintain the required technical parameters of tracks;
2. perform modernization and replacement investments on railway stations and railway routes;

## Source of assets financing

The source of financing assets of PKP Polskie Linie Kolejowe S.A. in 2015-2016

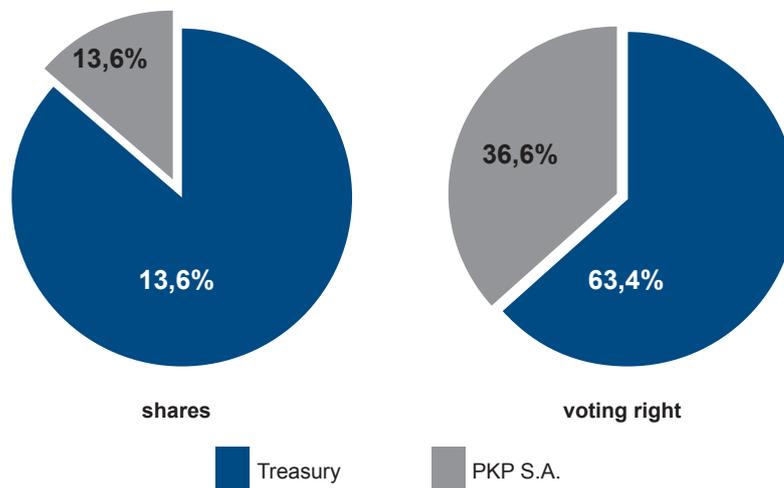


## Equity

In 2016, the Company's equity made up approx. 19% of its assets; in comparison to 2015, it decreased by approx. 1% due to the increase in cumulative net loss. In 2016, the share capital has been increased to the amount of PLN 16,696.6 million by the in-kind contribution made by

PKP S.A., comprising the right of perpetual usufruct of land and the title to the buildings and structures and facilities erected thereon with a total area of real estate amounting to 14.4070 ha.

Shareholder structure as of December 31, 2016 (shares vs. votes)  
(as of December 31, 2016)



## External capital

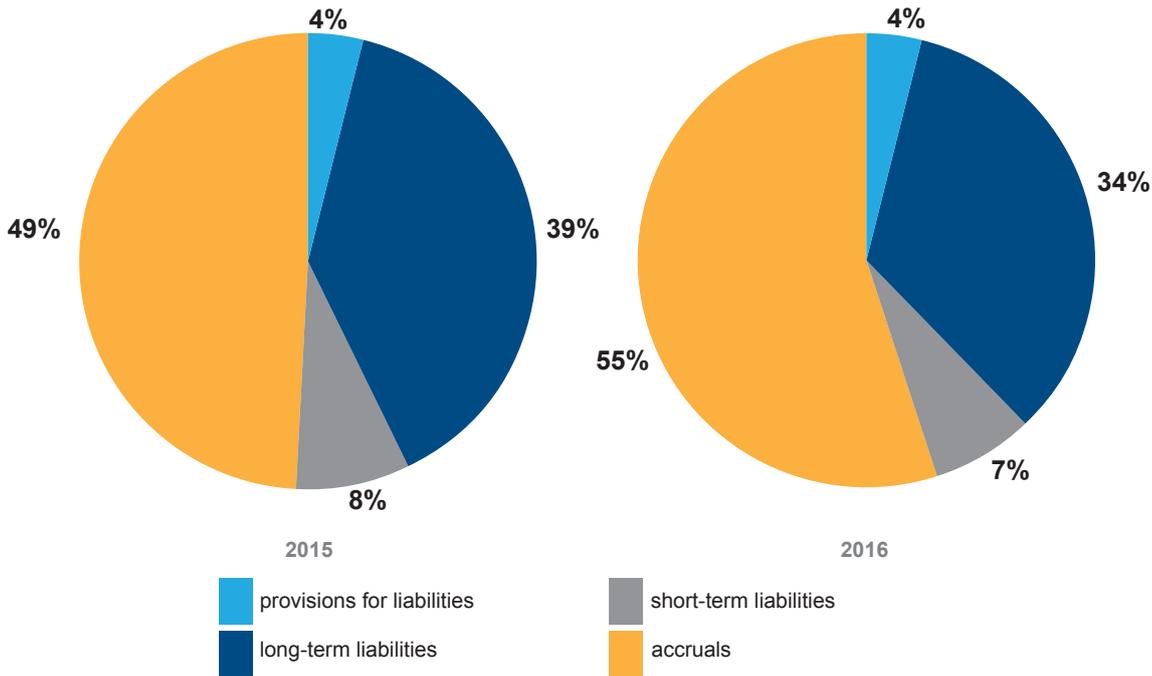
In 2016 external capital was the main source of financing assets of PKP Polskie Linie Kolejowe S.A. just like in previous years. As of December 31, 2016, they amounted to PLN 43,530 million, covering the Company's assets resources in 81%.

The share of external capital in financing the Company's assets increased in 2016 (when compared to 2015) by almost 2 percentage points (p.p.) as a result of higher

long-term prepayments and accruals in respect of funds obtained from the European Union, the Railway Fund and subsidies for financing the modernization of railway infrastructure.

In addition, an increase has been recorded in short-term liabilities and provisions for liabilities, mainly for pension benefits.

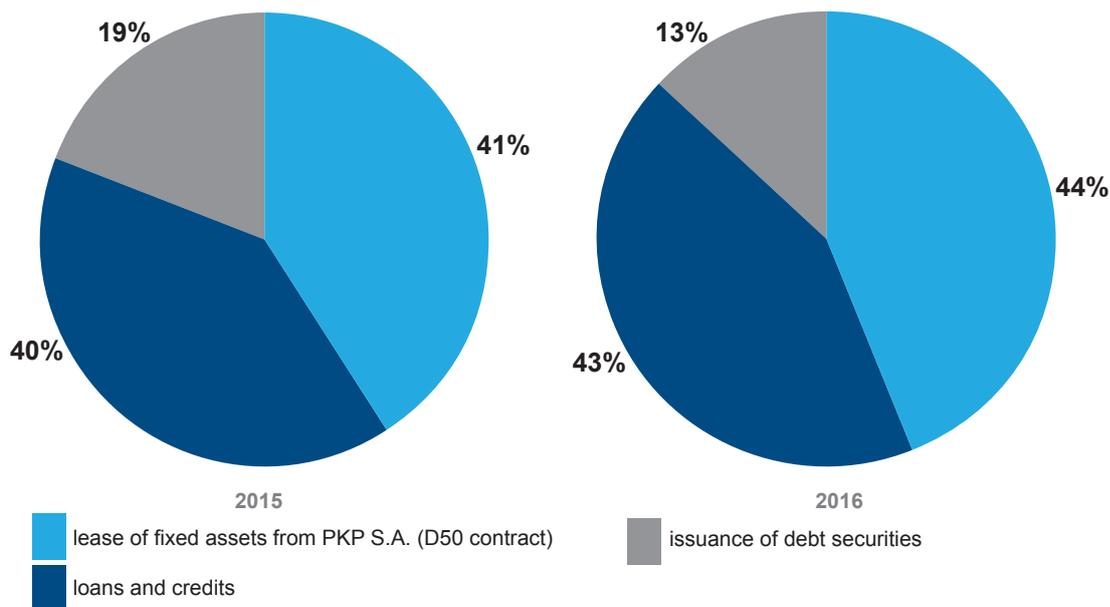
### Structure of external capital in 2015-2016



As of December 31, 2015, the long-term liabilities amounted to PLN 14,717.6 million. Approximately 44% of these liabilities were the liabilities arising from the contract concluded with PKP S.A. in 2001 for handing over the railway lines along with other immovable property required to manage these railway lines for paid use (contract D50-KN-1L/01). The loans extended by the EIB for co-funding and

pre-financing modernization of railway lines amounted to 43% of the liabilities, while the bonds issued for investment purposes amounted to 13% of the liabilities and decreased as compared to 2015 as a result of redemption of 1st tranche of bonds, comprising the nominal amount and capitalised interest.

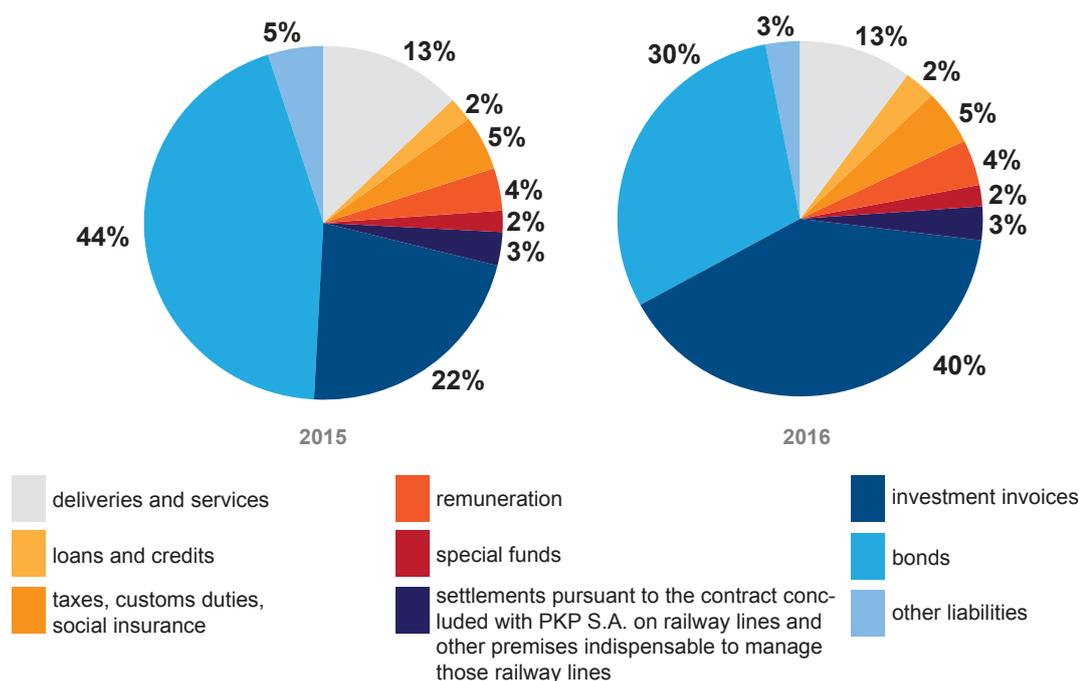
### Structure of long-term liabilities in 2014-2015



Short-term liabilities as at the end of 2016 amounted to PLN 3,350.6 million and were higher than in 2015 by approx. 5%. The recorded increase in short-term liabilities resulted from the invoices for investment works related

to the modernization of railway infrastructure, covered mainly by EU and state budget funds and from EIB loan instalments disbursed.

## Structure of short-term liabilities in 2015-2016



## Economic-financial results

## Financial results of the economic activity of PKP Polskie Linie Kolejowe S.A., in mln PLN

No.	Item	2015	2016	Change	
				Value (PLN million)	%
1.	Revenues from sales and equivalent	4 754,6	5 575,6	821,0	117,3
2.	Operating costs	5 528,1	5 949,9	421,8	107,6
3.	Result on sales (1-2)	-773,5	-374,3	399,2	48,4
4.	Other operating revenue	869,0	890,3	21,3	102,5
5.	Other operating costs	439,2	360,0	-79,2	82,0
6.	Result on other operating activity (4-5)	429,8	530,3	100,5	123,4
7.	Result on operating activity (3+6)	-343,7	156,0	499,7	-45,4
8.	Result on operating activity excluding depreciation and amortization (EBITDA)	763,5	1 514,5	751,0	198,4
9.	Financial revenue	97,2	56,0	-41,2	57,6
10.	Financial costs	105,2	256,8	151,6	244,1
11.	Result on financial operations (9-10)	-8,0	-200,8	-192,8	2 510,0
12.	Gross profit/loss (7+11)	-351,7	44,8	306,9	12,7
13.	Income tax	0,0	23,4	23,4	-
14.	Net profit/loss (12-13)	-351,7	-68,2	283,5	19,4
15.	Net profit/loss excluding depreciation and amortization	755,5	1 290,3	534,8	170,8

The net financial result achieved in 2016 was higher than the one achieved in 2015 by PLN 283.5 million, i.e. 80.6%. This is the best financial result achieved since 2010, the main source of which was the increase of budget subsidies for PKP Polskie Linie Kolejowe S.A. and increased revenue from the provision of railway lines to licensed carriers.

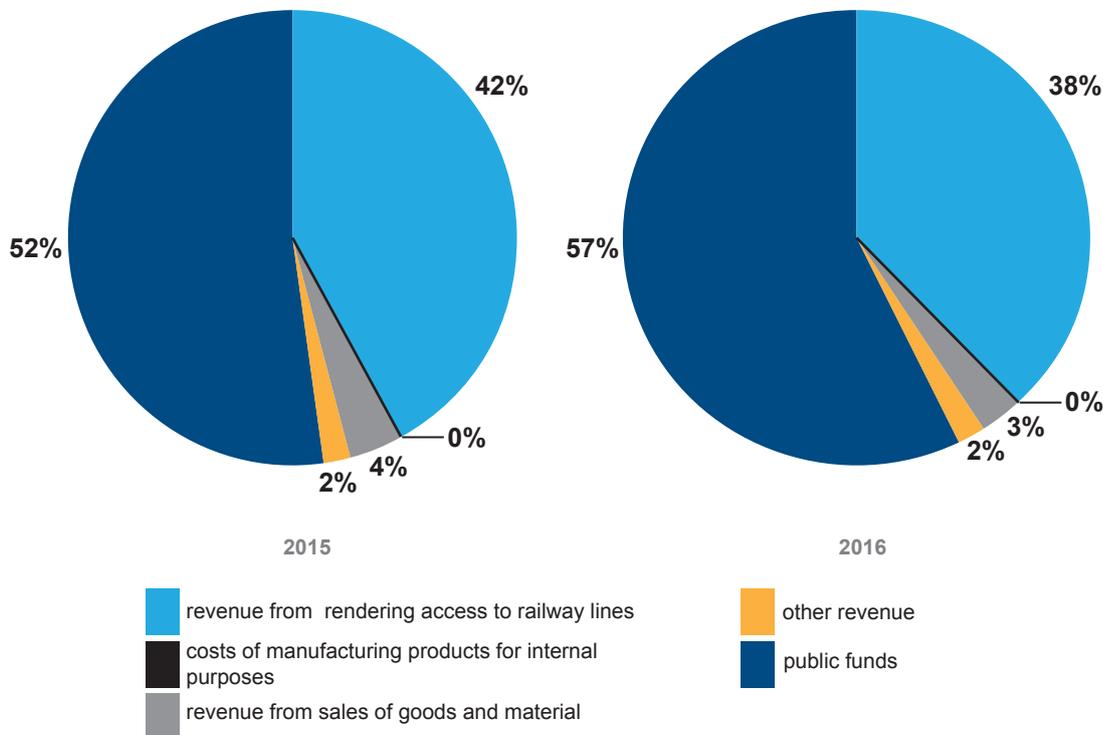
In 2016, the Company's income from business activity amounted to PLN 6,521.9 million covered more than 99% of the costs it had incurred. The highest position in total income is held by sales revenue and equivalent, including public funds and revenue from rendering access to railway lines to licensed passenger and freight operators.

The obtained public funds amounted to over 129% of the revenue in 2015 and have been earmarked for financing management costs, including for the implementation of maintenance and renovation tasks, thus contributing inter alia to the improvement of operating safety, increase in train speeds, maintenance of proper traffic flow on railway lines, and enhancement of their appearance. In 2016, PKP Polskie Linie Kolejowe S.A. additionally received a grant for relief in the basic fee, for minimal access to rail infrastructure for transports carried out throughout Poland, which was provided to carriers in the context of

inter-voivodship transport for participants in the World Youth Day.

Revenue from leasing the railway lines amounted to PLN 2,136.2 million and was approx. 7% higher than in 2015. The recorded increase resulted from higher operating performance of passenger operators – by 10.6% – due to increasing the rail transport offer. An increase in the number of calls became possible thanks to the implementation of several major modernizations of railway lines by PKP Polskie Linie Kolejowe S.A. in the years 2014-2015 (e.g. Warszawa-Gdańsk, Warszawa-Łódź, Warszawa-Tłuszcz (Sadowne), Kraków-Rzeszów), which was accompanied by a noticeable effect for the market in the form of shortening of travel times between the majority of large cities in Poland. As a result of the increase in railway parameters and the removal of existing operating restrictions, the network capacity has also increased, which allowed the passenger carriers to develop a grid of connections and increase the frequency of train journeys. It also resulted in a real increase in train speeds on modernized sections.

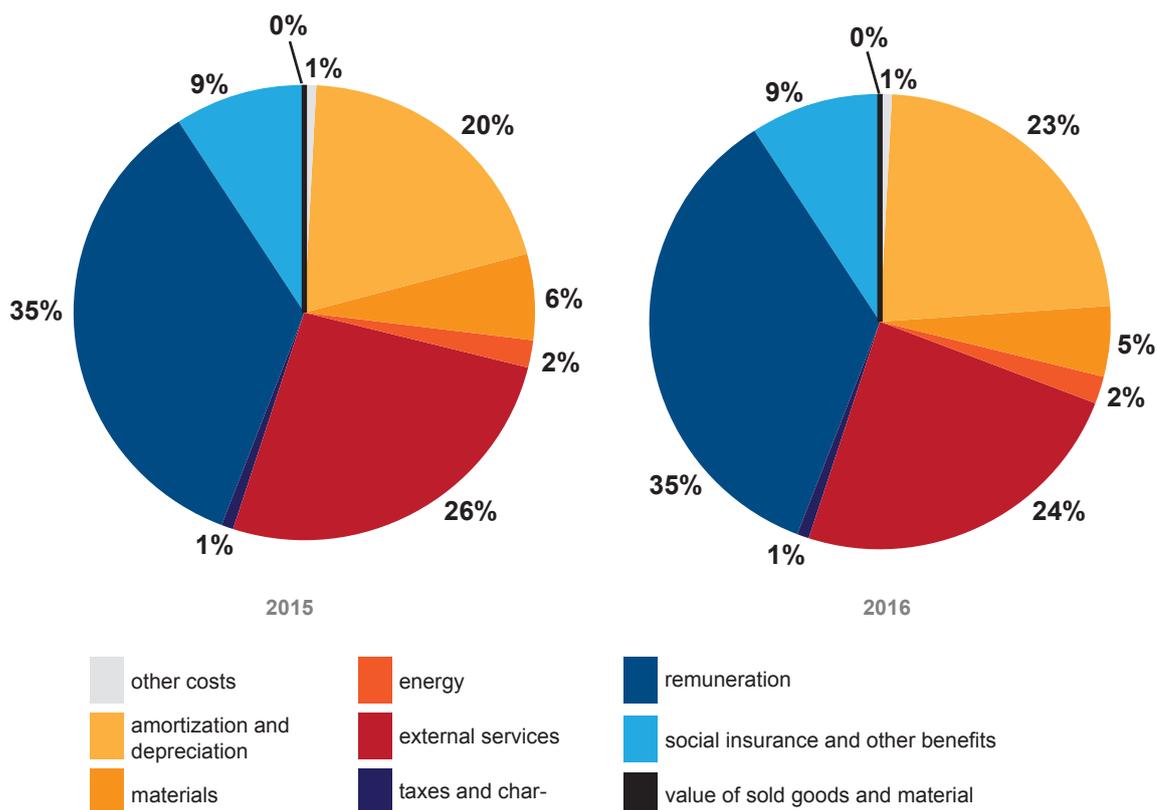
Sales revenue and equivalent in 2015-2016



As result of its business activity, in 2016 the Company incurred costs amounting to PLN 6,566.8 million, which were 8.1% higher than in 2015. As in previous years,

labor costs represented approximately 40% of these costs.

## Cost structure by type in 2015-2016



Significant increase in operating costs in 2016, as compared to 2015, can be observed for such items as:

1. depreciation – due to higher deductions from expenses on fixed assets settled in 2016;
2. materials and external services – in relation to the implementation of a more extensive scope of maintenance and repair works enabling the provision of proper standard of safety and elimination of speed limits on railway lines;
3. labour costs – as a consequence of raises in remuneration, an increase in the minimum wage, payment of additional remuneration for tasks related to the organisation of the World Youth Day, and higher level of work.

incomes from the carriers, as well as deposits related to the funds obtained from the EIB for the implementation of investment projects. Workforce productivity also increased - the revenues from sales amounted to PLN 142,200.00 per one employee employed in the company, which is by PLN 19,900.00 more than in 2015.

In 2016, PKP Polskie Linie Kolejowe S.A. reported improvement in the efficiency of the management of assets as evidenced by more favourable level of profitability than in 2015 acquired thanks to higher public funds and revenues obtained due to making the routes available for licensed carriers. Moreover, the Company successfully sought its claims and, as a result, the period of waiting for the recovery of receivables has been reduced by 8 days. As a consequence of the redemption of part of the bonds issued to finance the investment activities, the debt was reduced. The Company's financial liquidity has also improved as a result of funds for the investment of own funds which come from the value added tax (VAT) refunded by the tax office, funds from recapitalisation and

# Train path sales

## Timetable as the Company's primary product

PKP Polskie Linie Kolejowe S.A. is the manager of the national railway infrastructure to which it renders access based on unbiased agreements signed with licensed railway operators. In 2016, the access was granted subject to the principles established in the Act on Railway Transport as well as in the regulation of the Minister competent for transport on the conditions of access to and use of railway infrastructure of 5 June 2014.

The basic product of PKP Polskie Linie Kolejowe S.A. is the timetable sold as train routes arranged upon the order of a railway operator. In 2016, a total of 2,392,254 train rides were performed, including on the basis of:

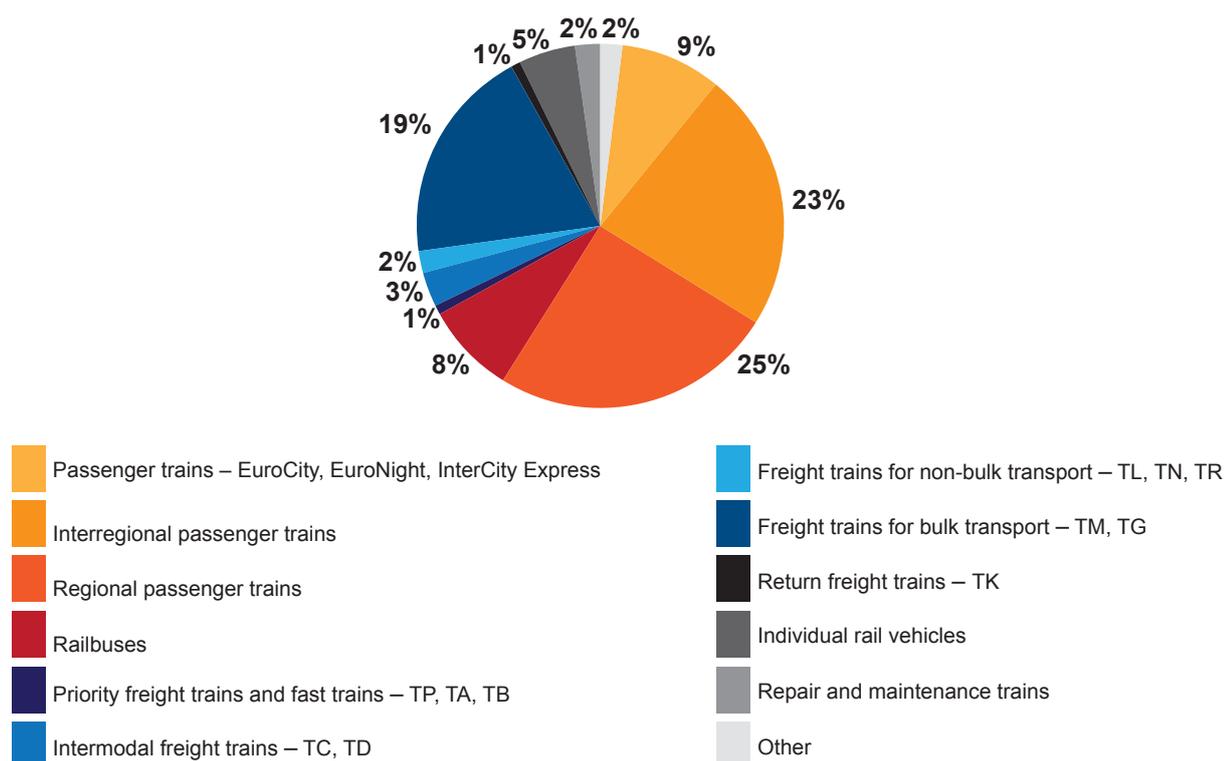
1. The Annual Timetable prepared on the basis of applications made by operators. It was updated during its validity period On pre-arranged dates – 1,610,404 train rides;
2. Individual Timetables developed by by PKP Polskie Linie Kolejowe S.A. when there is some throughput available, upon request made by individual operators for train routes allocation – 781,850 train rides.

In 2016, the Company made its railway lines available to 86 operators, including 16 lines for passenger services, 67 lines for freight services and 3 for passenger & freight services. 6 new clients launched their business activity on the network managed by PKP Polskie Linie Kolejowe S.A. The basic reference value in terms of measuring access to railway lines is operating performance expressed in train-kilometres [train-km]. In 2016, 225.46 million train-km were achieved, including 155.14 million train-km in passenger services and 70.32 million train-km in freight services.

In 2016, the Company recorded:

1. a 6.56% increase in total operating performance of its clients as compared to 2014 (passenger service segment witnessed an increase of 10.55%, while the freight service segment – a decrease of 1.29%);
2. a stable upward trend in transport services rendered by freight operators from outside the PKP Group, whose share in the entire freight transport segment grew from 39.67% in 2015 to 43.87% in 2016.

Structure of operating performance per train types in 2016



## Data concerning completed international carriages

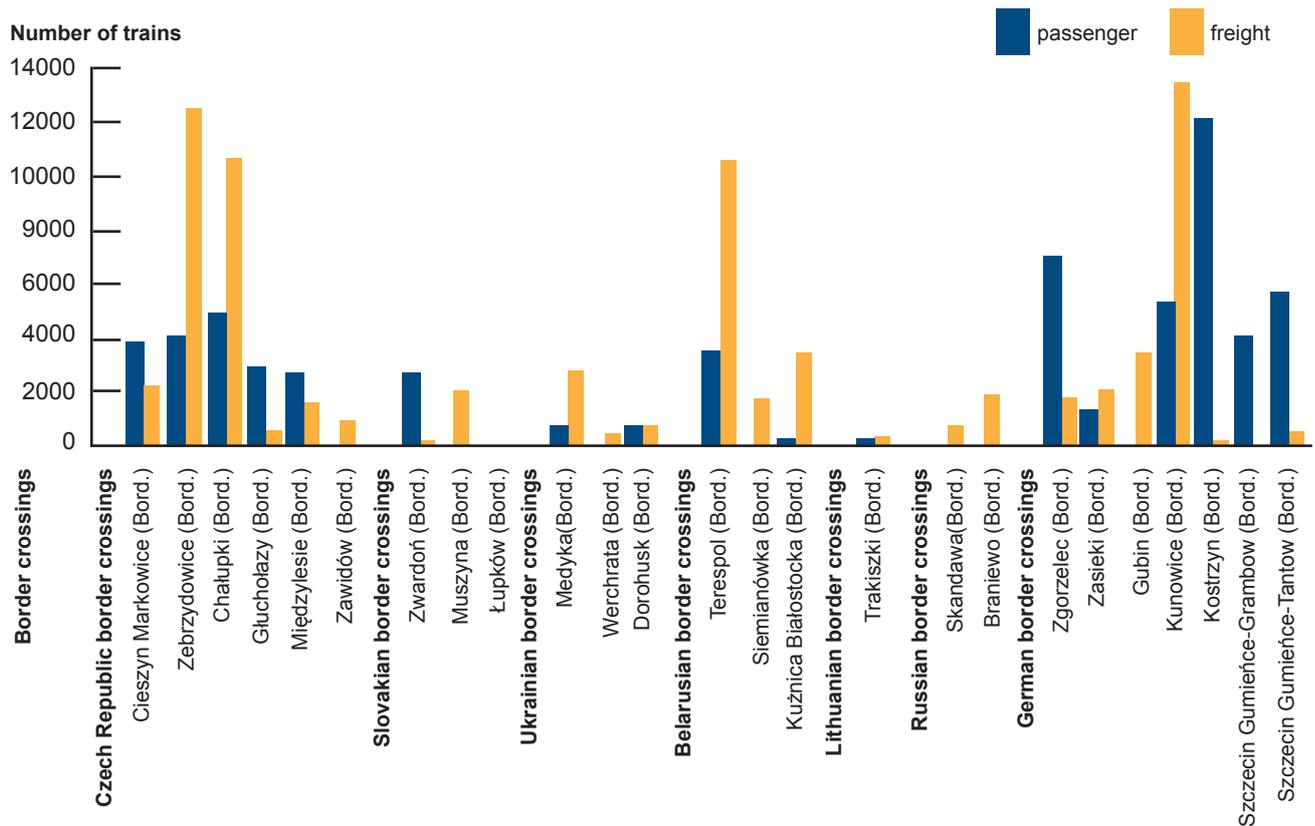
International transport services in cross-border traffic in 2016 were performed by 44 operators, who in most cases used the following border crossings:

1. for passenger traffic: Kostrzyn (Poland-Germany), Zgorzelec (Poland-Germany), Szczecin Gumieńce

(Poland - Germany), Kunowice (Poland - Germany) and Chałupki (Poland - Czech Republic);

2. for freight traffic: Kunowice (Poland-Germany), Zebrydowice (Poland-Czech Republic), Chałupki (Poland-Czech Republic) and Terespol (Poland-Belarus).

International transport services in cross-border traffic



As part of the Individual Timetables, 41,728 rides of international trains were organized (of which across the Czech border – 16,050, German border – 11,797, Belorussian border – 9,569, Slovakian border – 1,614, Ukrainian border – 1,377, Russian border – 948, Lithuanian border – 373), which is 6.03% more than in 2015 (39,354 runs). Within 24 hours, PKP Polskie Linie Kolejowe S.A accepts and performs on average 132 orders for international trains as part of Individual Timetables. Most rides take place between Poland and Germany/Czech Republic.

To make it easier for the operators to use international train routes, the One Stop Shop (OSS) unit at PKP Polskie Linie Kolejowe S.A., which is part of the international OSS network within the association of European railway infrastructure managers RailNetEurope (RNE), offers comprehensive information about the conditions that need to be met to obtain access to the RNE members' infrastructure

as well as to the services and products they have on offer. A client who is interested in an international train ride may turn to one of the OSS, which will then take over the process of allocation along the entire train route.

In 2016, PKP Polskie Linie Kolejowe S.A. cooperates with neighbouring railway infrastructure managers in terms of annual and individual timetables in both passenger and freight traffic. Cooperation with RŽD (Russia), LG (Lithuania), BC (Belarus) and UZ (Ukraine) railways is based on bilateral agreements, while with DB Netz AG (Germany), SŽDC (the Czech Republic) and ŽSR (Slovakia) – under bilateral agreements as well as regulations of international organisations.

Trains rides under Individual Timetables are arranged in a separate way:

1. between PKP Polskie Linie Kolejowe S.A. and DB Netz AG, SŽDC and ŽSR – they are based on a common procedure (24h/day, through the Railway Traffic

- Management Centre branches (former Railway Traffic Management Centre) being coordinated in Warsaw;
2. for the remaining infrastructure managers – by the OSS unit at the RailwayTraffic Management Centre in Warsaw.

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## Operation systems

The primary system used at the Railway Traffic Management Centre is the Operating Performance Registration System (SEPE). It cooperates with approx. 30 systems used by PKP Polskie Linie Kolejowe S.A. and systems owned by railway operators.

The information included in the SEPE system come from the following sources:

1. the Train Dispatcher Support System (SWDR) in which train dispatchers record times at which trains pass through their posts within an average time of approx. 3 minutes after the train has passed through;
2. GPS transmitters installed on traction vehicles of railway operators;
3. data from Local Control Command and Signalling Centres (LCS, the so-called “track signal”);
4. data registered in SEPE by line dispatchers based on information from train dispatchers.

Apart from data on the current location of trains, SEPE also registers data on reasons for delays along with an indication of the entity responsible for the delay, events occurring on the network managed by the Company, planned and emergency track closures.

Data collected in SEPE is used in the exploitation process on an ongoing basis. It is also used for analytical purposes and as basis for settlements with operators for using railway infrastructure and for the quality of services provided.

Information on the current location of trains, delays and reasons for such delays as well as events occurring on the railway network are presented in the Crisis Management Centre Map (CMC Map) application constituting the primary tool in crisis situations. The CMC Map is also used in the exploitation process on an ongoing basis.

The application used to monitor international train traffic is the Train Information System (TIS), which collects and presents data on trains running on railway networks in most EU Member States.

Thanks to the involvement of the employees of PKP Polskie Linie Kolejowe S.A. and cooperation with representatives of European Traffic Management Centres under RNE, an

additional functionality of TIS in the form of the TCCCom module has been developed. This module, operating as a communicator, allows for an electronic exchange of information on train traffic and operation between European Traffic Management Centres. Applications described above (apart from TIS) have been developed by PKP Polskie Linie Kolejowe S.A. using own means, which significantly facilitated the software development and implementation process.

In 2016, a project launched in 2015 entitled “Development of a design, performance and implementation of an IT solution titled SEPEII – Operating Performance Registration System v. II” has been continued; the new system is planned to replace the SEPE system currently in use.

# Infrastructure

## Rail roads

In 2016, the length of railway lines in use changed. The modification was a result of the need to adapt infrastructure to the changing transport needs.

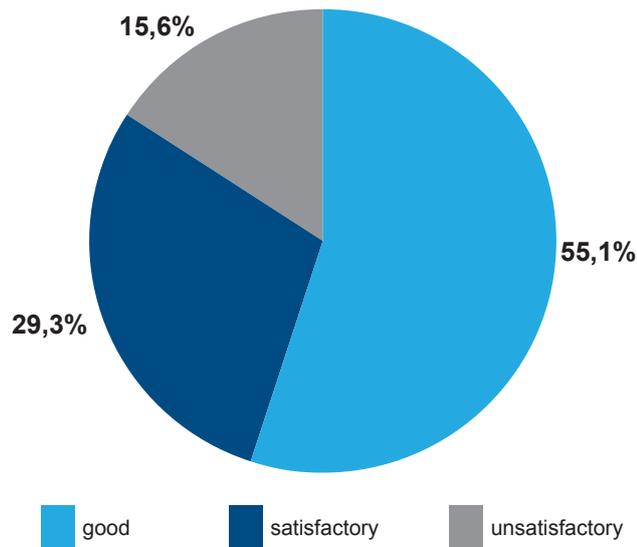
List of railway infrastructure in use, managed by PKP Polskie Linie Kolejowe S.A. (as at 31 December 2016):

1. 18,427 km of railway lines (36,079 km of tracks), including:
  - 27,041 km of route tracks and main principal tracks at stations;
  - 9,038 km of station tracks.
2. 39,571 turnouts, including:
  - 18,041 turnouts in route tracks and main principal tracks;
  - 21,530 turnouts in station tracks.
3. 14,681 level crossings, including on active railway lines; a total of 12,612, including level crossings of cat.:
  - A - 2,409 items;
  - B - 1,155 items;
  - C - 1,366 items;
  - D - 6,634 items;
  - F - 563 items;
  - pedestrian crossings of cat. E - 485 items.
4. 25,382 engineering structures, including 6,377 bridges and viaducts;
5. 5,957 buildings;
6. 13,511 structures.

### Road infrastructure technical condition

As a result of the maintenance and repair work as well as investment tasks performed in 2016, the length of railway line tracks graded as good in terms of technical condition (as at 31 December 2016) represented 55.1% of the total track length, which is a 0,6% increase in comparison to the status

from 31 December 2015, 54.5% of tracks were good and at the same time the length of tracks, with unsatisfactory mark, decreased by 2.7% (at the end of 2016 it was 15.6% and by the end of 2015 year - 18.3%).



The diagram above was developed based on the following criteria:

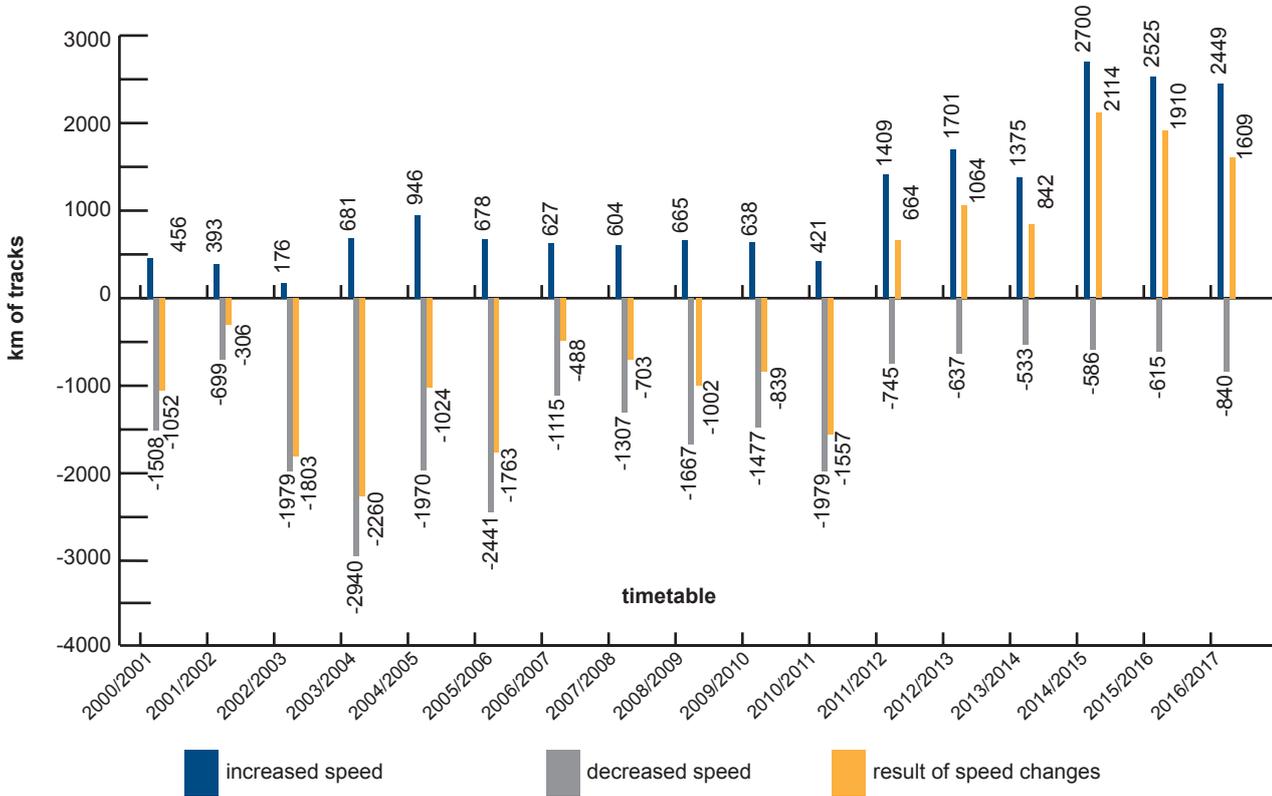
1. good – railway lines operated in line with the assumed parameters, only maintenance work is required;
2. satisfactory – railway lines with lower operation

parameters (reduced top timetable speed, local speed limits); to restore the maximum operational parameters, in addition to maintenance work, ongoing repairs are required comprising replacement of faulty track elements;

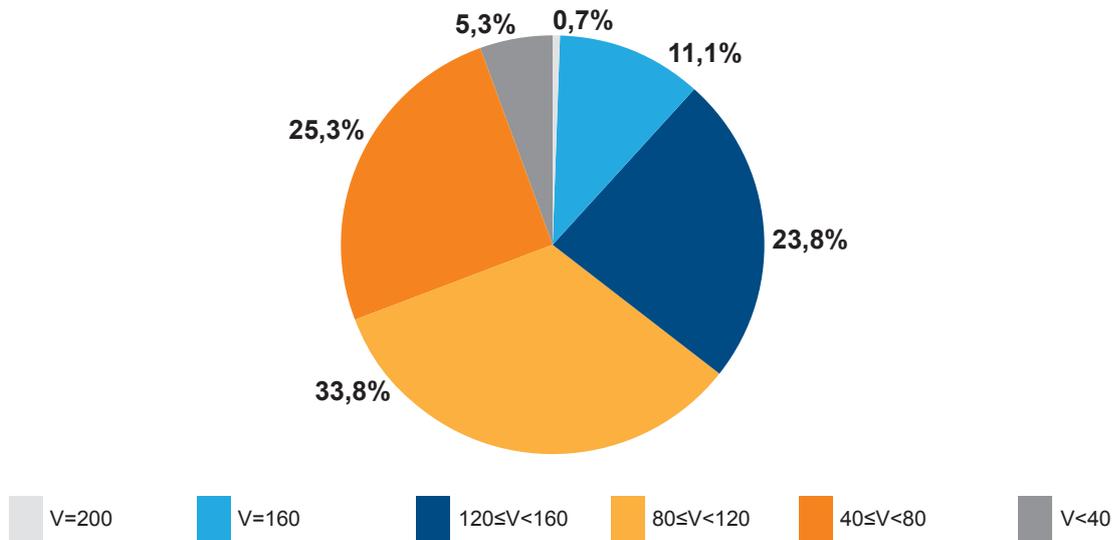
3. unsatisfactory – railway lines of significantly lower operation parameters (low timetable speeds, large number of local speed limits, lower permissible loads), which qualify railway tracks for comprehensive replacement.

The effect of improved technical condition of tracks was the higher top timetable speed in the Train Timetable 2016/2017 for passenger trains on 2,449 km of tracks, and decreased speed on 840 km of tracks.

**The length of operated railway line tracks managed by PKP Polskie Linie Kolejowe S.A. where top timetable speeds were changed (as at day when the Train Timetable became effective)**



**Percentage structure of top timetable speeds as at the day when the Train Timetable 2016/17 became effective**



The Company's successes also include the continuing stable growth in the length of tracks with a top timetable speed of  $V \geq 160$  km/h. As at the end of 2016, the length of such

tracks amounted to 3,178 km, compared to 2,813 km as at the end of 2015.

## Automatics and Telecommunication

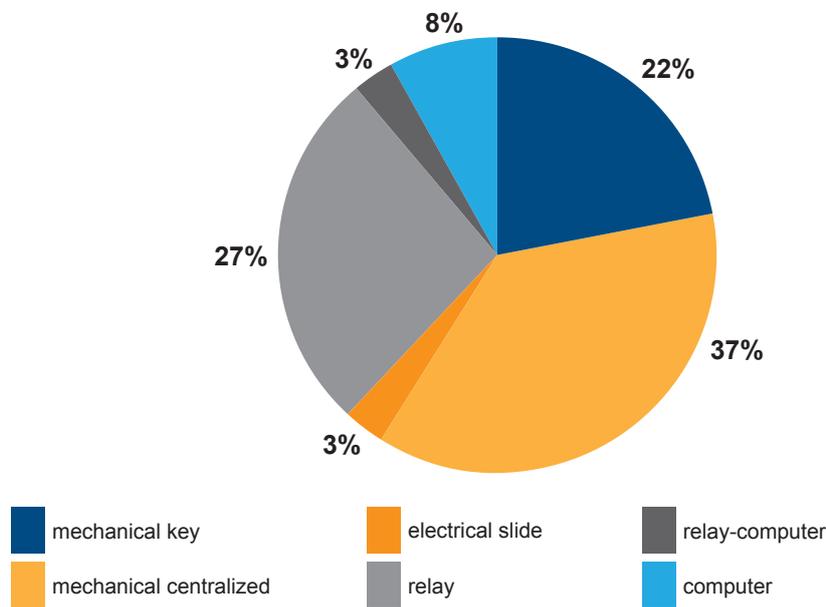
Control command and signalling (CCS) systems can be divided into three basic functional groups:

1. station equipment installed at operating control points;
2. wayside equipment controlling train traffic on railway routes;
3. traffic safety equipment at level crossings.

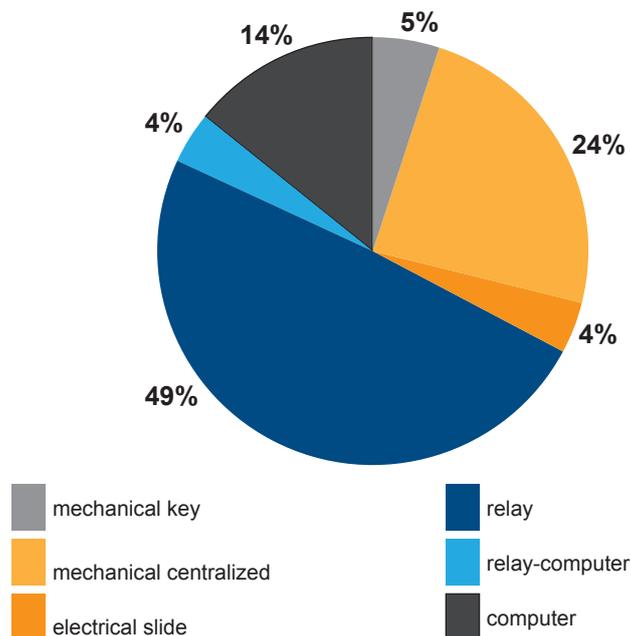
The above-mentioned systems still predominantly use relay and mechanical equipment. However, the dynamic development of IT technology has resulted in its vast

application in CCS and automatic control systems. The latest generation of CCS equipment comprises computer systems and relay computer (hybrid) systems which combine cutting-edge features, reliability and extended functionality in addition to ensuring a high level of traffic safety. According to the status of 31 December 2016, the computer system was installed in 147 switch circles, controlling 2,585 switches and 3,175 signalers. The remote control unit comprises 1,482 km of rail lines, the safety of which is supervised by 27 Local Traffic Control Centers (LCS).

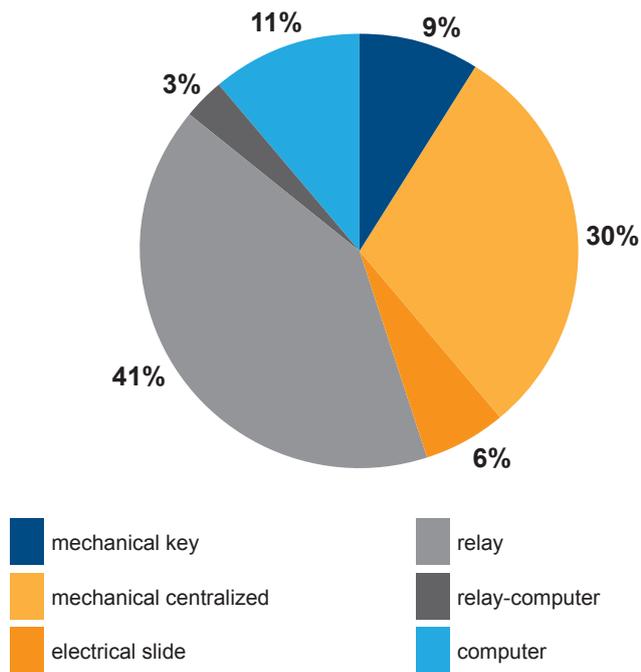
**The signal box control areas are equipped in various types of station traffic control command and signalling equipment**



**Light signals in various types of station traffic control devices**



### Switches in various types of station traffic control command and signalling equipment

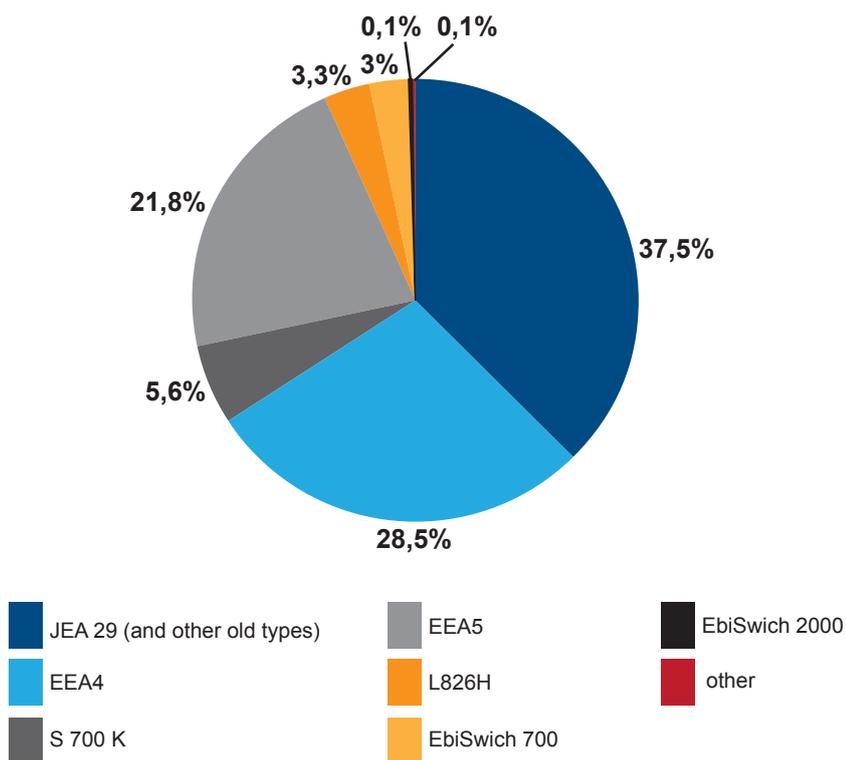


Point machines play an important role in safe and efficient rail traffic management. In 2016, as a result of modernization works and purchase carried out as part of maintenance works on the PKP Polskie Linie Kolejowe S.A. network 847 new switches were introduced.

As at 31 December 2016, a total of 39,147 mechanical and electrical point machines (of which 75.7% represents

electrical point machines and 24.3% represents mechanical point machines) have been used on the railway line network managed by PKP Polskie Linie Kolejowe S.A. The share of individual types of point machines in the total number of point machines has been presented in the chart below.

### Types of point machines used



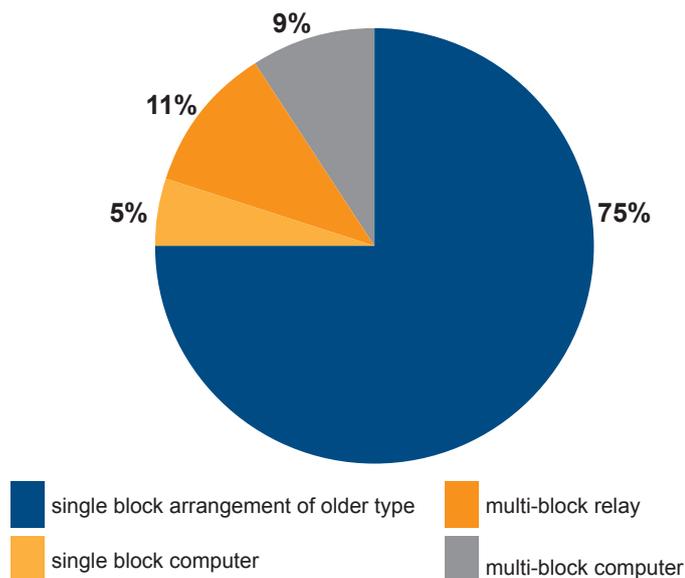
### Groups of railway traffic control devices in numbers

Station equipment	As at 31 December 2016		
	Signalling centre control area	Switch conversion	Signalling device
mechanical key	639	4 219	2 285
mechanical centralized	1 073	13 966	11 291
electrical slide	91	2 886	1 953
relay	799	18 888	22 814
relay-computer	81	1 269	1 784
computer	233	5 284	6 419
<b>In total</b>	<b>2 916</b>	<b>46 512</b>	<b>46 546</b>

The safety of train rides between operating control points is ensured by block signalling systems – single block and multi block – which have been installed on 15,861 km of railway lines. Single-block systems are predominant on railway lines managed by PKP Polskie Linie Kolejowe S.A. – 12,665 km of railway lines have them, while 608 km have systems utilizing latest computer-controlled

technologies. Multi-block systems have been installed on 3,197 km of railway lines, of which 1,355 are computer-based blocks, featuring integrated remote diagnosis systems, controlling and recording technical and operational parameters of the system.

Types of signalling block systems

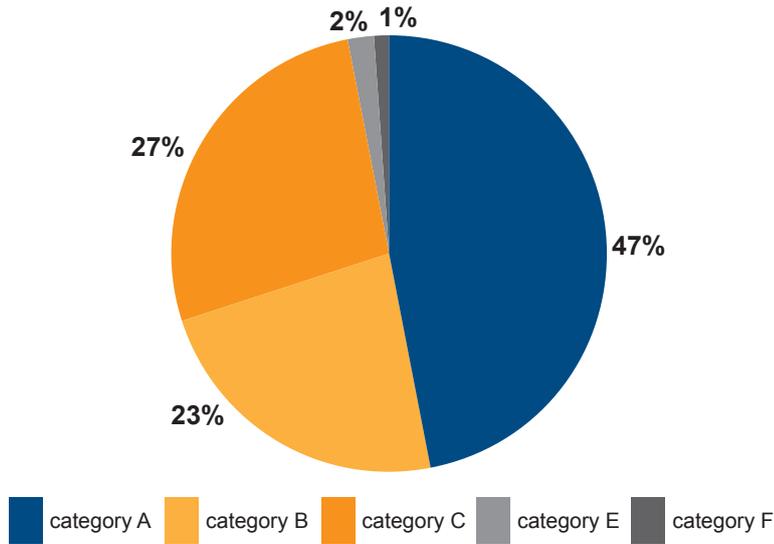


The railway line network managed by PKP Polskie Linie Kolejowe S.A. features 12,664 level crossings, with 5,166 crossings equipped in traffic safety equipment, which represents 41% of all level crossings.

The computer technology is also used in traffic safety equipment installed on level crossings. The new generation of equipment used at crossings features auto-diagnostic systems, systems that register all operation events as well as solutions controlling the operation of the entire system. The intersections of railway lines managed by PKP Polskie Linie Kolejowe S.A. and public roads are equipped with 1,556 sets of such modern technical solutions, installed on category A, B, C and E crossings,

which represents 30.1% of all types of crossing equipment used.

**Division of level crossings equipped in traffic safety equipment by individual categories**

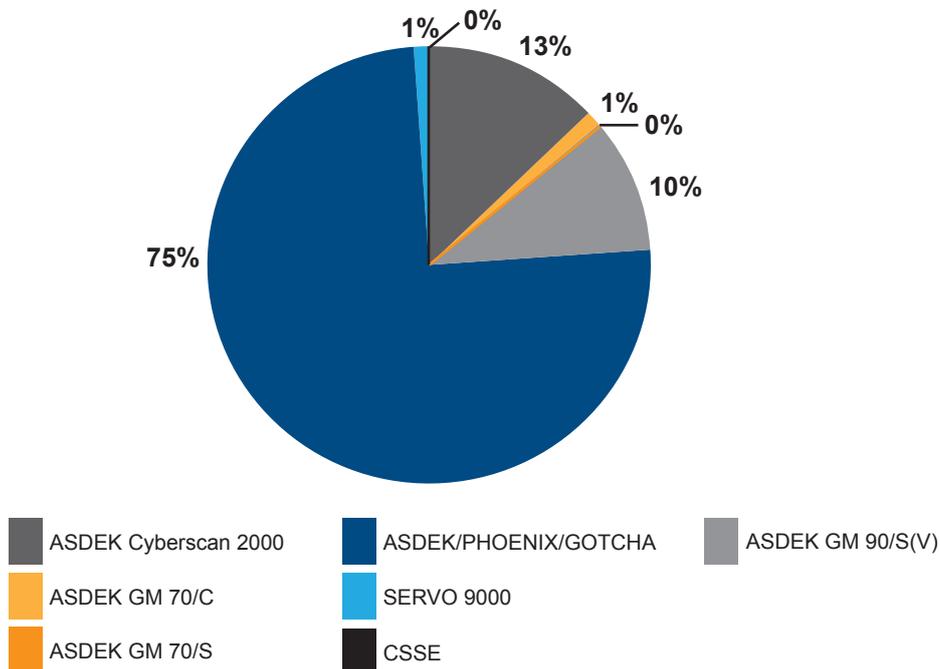


In order to ensure a high level of operating safety, the modernized railway lines were equipped with defect detectors. These systems, depending on their diagnostic configuration, can detect (while the train is in motion):

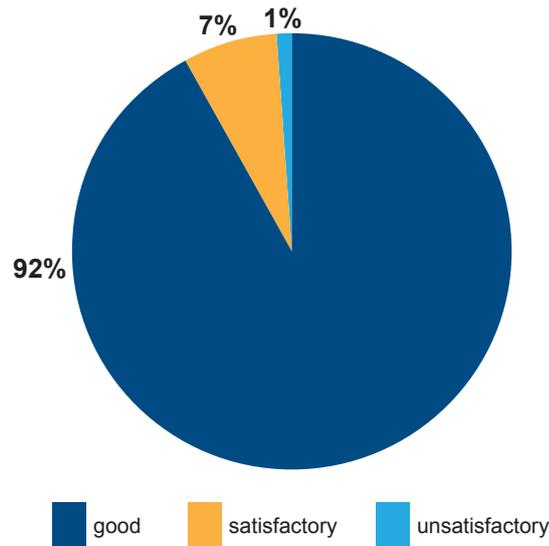
1. failure of axle bearings (GM function);
2. failure of block and disc brakes (GH function);
3. deformation of wheel rims (PM function);
4. dynamic overload (PD function);
5. excessive axle and line loads (OK function).

In 2016, in relation to the modernization works carried out by the Company, 12 new defect detectors (dSAT) have been constructed, thus increasing the total number of these detectors operating on the network from 192 in 2015 to 204 at the end of 2016, thus contributing to a higher level of railway infrastructure safety on key railway lines. In addition to the ongoing works, 17 first generation devices have been upgraded to the latest generation of computer technology, which enabled meeting the interoperability requirements on the serviced lines.

**Percentage share of types of defect detectors used**



### Technical conditions of defect detectors used



PKP Polskie Linie Kolejowe S.A. is an entity responsible for the implementation of ERTMS (the European Rail Traffic Management System) in Poland, therefore the Company continues the process of implementing projects related to the deployment of ETCS (the European Train Control System) and GSM-R (the Global System for Mobile Communications – Railways), co-financed by the European Union under the Operational Programme Infrastructure and Environment (OPI&E) and other EU support programmes.

As part of actions related to the exploitation of the ETCS level 1 system on the Central Rail Line (CMK), Olszamiwice - Zawiercie section, which allows the trains to travel at the maximum speed of 200 km/h, the Company completed the proceedings and concluded the agreement concerning "Maintenance services of the ETCS level 1 system on the section of the CMK line Grodzisk Mazowiecki-Zawiercie for 2016-2019". In connection with the implementation of this agreement, the Company will support the work of the Railway Lines District Units in the area of coordination of maintenance and operation activities and supervision over the proper implementation of the agreement.

In 2016, ETCS level 2 system equipment installed under the task entitled "Modernization of railway line E30, Stage II. Pilot implementation of ERTMS/ ETCS and ERTMS/GSM-R in Poland on the Legnica - Węglińiec - Bielawa Dolna section" was commissioned (permit of the President of the Office of Rail Transport (UTK) no. PL 63 2016 0003). Operation of the ETCS level 2 system is based on "Temporary operating manual of centralised equipment of ERTMS/ETCS level 2 system" Ie-32 and "Instruction on the implementation of trains with ERTMS/ETCS system level 2" Ir-1b. These documents are subject to regular supervision and updates, on the basis of acquired operation experience. In addition, the Cryptographic Key Management Centre operates within the Company which, according to the document "Procedure for the management of cryptographic keys in the ERTMS/

ETCS system", generates and distributes encryption keys for the purposes of data transmission between OBU units of ETCS level 2 and radio control system.

Moreover, in 2016 the ERTMS/ETCS level 1 system on the section Psary-Kozłów of the railways no. 570 and 64 was commissioned. It was developed within the task entitled "Implementation of the ERTMS/ETCS level 1 system on the railways 570 and 64 on the section Psary-Kozłów" (permit of the President of the Office of Rail Transport no. PL 63 2016 0001).

For the ETCS level 1 LS Limited Supervision system, (limited supervision), developed on the section on line no. 356 Poznań Wschód-Wągrowiec, in the framework of the implementation of the task "Design and installation of the ETCS level 1 Limited Supervision system on the railway line no. 356, the Poznań Wschód-Wągrowiec section", the approval of the President of the Office of Rail Transport to commission the structural Control-Command and Signalling Track-side Sub-system was obtained (permit of the President of the Office of Rail Transport no. PL 63 2016 0006).

In 2016, the works on the implementation of the ERTMS/ETCS level 2 system on the lines: E 65 (design and construction of the ERTMS/ETCS level 2 system and ERTMS/GSM-R together with the rail traffic control devices of the override layer for 8 LCS on the line E-65 Warsaw-Gdynia), 1 and 17 (design and execution of LCS Skierniewice and ERTMS/ETCS level 2/GSM-R on the Warszawa Zachodnia-Koluszki at 3.900-104.918 km of the line no. 1 and on the section Koluszki - Łódź Widzew at 26.400-7.200 km of the line no. 17) and 132 (modernization of the E 30 railway line, Stage II. Deployment of ERTMS/ETCS and ERTMS/GSM-R in Poland on the Legnica-Wrocław-Opole section). Moreover, also the activities related to reprogramming of the ETCS level 1 system on the north section of the line no. 4 in order to allow the trains to travel at the speed of 200 km/h.

The condition of the lines equipped with track-side ERTMS/ETCS system on 31 December 2016 was: level 1 - 267 km completed, in the implementation of 51 km (level 1 LS); level 2 - 84 km completed, in the implementation of 603 km. In 2016, the Operational Programme "Infrastructure and Environment" 7.1-14 (OPI&E) was completed and approval for the commissioning of the structural "Control-Command and Signalling Track-side Sub-system" (permit of the President of the Office of Rail Transport no. PL 63 2016 0002), in the scope of ERTMS/GSM-R system, on the railway line E30 on the Legnica-Wrocław-Opole section. The project of GSM-R system development on the line E20/CE20 Kunowice-Terespol was also completed within the investment project OPI&E 7.1-25 (permit of the President of the Office Of Rail Transport no. PL 63 2016 005).

The works related to the construction and acceptance of GSM-R system within the framework of the modernization of the railway line Warszawa-Łódź - OPI&E 7.1-24.1 and 7.1-24.3 projects and modernization of railway lines E65/C-E65 on the Warszawa-Gdynia section in the framework of the OPI&E 5.1-1 project - "Modernization of the railway line E 65/C-E 65 on the Warszawa-Gdynia section in the scope of the override layer LCS, ERTMS/ETCS/GSM-R, DSAT and power supply of the traction system-Phase II."

Works related to the development of tender documentation for the project OPI&E 5.1-20 "Construction of infrastructure ERTMS/GSM-R on the railway lines PKP PLK S.A. within the framework of ERTMS NPW".

As part of the work related to the preparation for the operation of the GSM-R system on railway lines managed by PKP Polskie Linie Kolejowe S.A. the new internal regulation "Instruction on organisation and use of GSM-R le-16" was developed and accepted by the Management Board of PKP Polskie Linie Kolejowe S.A. and the existing instructions "Signalling instruction le-1" and "Instruction in use of train radiotelephone equipment Ir-5" were adjusted.

As regards the maintenance of the GSM-R system, the tendering procedure was continued and an agreement considering "Maintenance of GSM-R subsystem of BSS network with accompanying infrastructure on the section of the E30 Legnica - Węglińiec - Bielawa Dolna railway line" was signed, providing the necessary technical support for the Railway Lines District Units in the scope of the GSM-R system. The GSM-R radio network as of 31 December 2016 amounted to 1078 km of railway lines for which a operation permit was granted and there are 468 km of railway lines where the GSM-R system is under construction.

## Important achievements in the field of research and technological development

1. In 2016 many internal regulations were introduced and amended, including:
  - technical requirements for railway traffic lights used on railway lines and their supporting structures (Ie-117);
  - technical conditions for the central purchase of signal and teletechnical cables for the year 2017;
  - requirements concerning CCTV systems on the rail-road crossings of A,F categories and passageways, operated from a distance and other stations, related to railway traffic;
  - guidelines for preparation of regulations for terminal of devices detecting emergency situations in rolling stock while driving (Ie-31);
  - guidelines for technical support of relays used in the srk devices (Ie-121);
  - instructions on the organisation and use of the GSM-R network (Ie-16).
2. Changes have been developed and consolidated text has been introduced for use for:
  - signalling instructions (Ie-1);
  - instructions concerning principles of the construction and maintenance of the mechanical railway traffic control devices Ie-11 (E-20).
3. In the context of ensuring the continuity of supplies of spare parts for srk systems and devices, used within the PKP Polskie Linie Kolejowe S.A. Within the framework of the central agreements for many years with key producers in the field of railway automatics, tender procedures were carried out, enabling the signing of agreements for:
  - delivery of equipment and spare parts for mechanical srk devices in the years 2017-2018;
  - delivery and repair in the range of components for electromechanical and relay srk devices in the years 2017-2020;
  - delivery of spare parts and accessories to the station's OSA-H type system, self-locking EAC type blockade and interfaces (interfaces) of these systems in the years 2017 - 2020;
  - delivery of track and signal transformers and signal chokes of REJ type or equivalent in the years 2017-2020;
  - delivery in the field of SHP track electromagnets in the years 2017-2018;
  - supply of cables and wires for the maintenance of srk devices in 2017.
4. As part of the protection of the service for the modern railway telecommunication equipment, a tender procedure enabling the signing of agreement concerning the provision of maintenance services ensuring full technical efficiency of the traffic control unit has been carried out based on DGT IPR system and NetCRR2 recorders in 2016-2019;

5. A number of activities have been implemented to prepare automation and telecommunication equipment for World Youth Day (WYD) i.e. by means of replacement or construction of 65 units for electric power generator, purchase of 190 portable and 8 fixed stationary radio-telephones, regeneration switch drives on the premises of Railway Lines District Unit in Krakow, repair of cable routs on 9 crossings on the premises of the Railway Lines District Unit in Nowy Sącz, as well as provide increased services of executive companies on the access routes to the realisation sites of WYD;
6. Within the framework of providing fixed technical parameters of the railway lines, the replacement of wheel sensors ELS-93 which were exploited and prone to damages and created with the use of old technology with moder sensors ELS-95. Elimination of old wheel sensors ELD-93 from the PKP Polskie Linie Kolejowe S.A. network improved the performance of railway lines by reducing the time when signalling and train control systems are unavailable on routes and stations and thus reducing train delays;
7. In 2016, a number of works aimed at introducing a new version of the IT tool in the Company, intended for the base of railway and road crossings and passages in the e-POS system (Network Description Management) module TRAIN RIDE RECORD, were completed. The works carried out were connected with the implementation of the guidelines in the field of crossings metrics, resulting from the implementation of the Regulation of the Minister responsible for transport on the technical conditions to be met in the context of crossings of railway lines and rail sidings with roads and their location on 20 October 2015;
8. A modernization plan for automation and telecommunication equipment was developed, which allowed the modernization and investment needs in the area of automation and telecommunication industry to be prioritised and assigned to specific priority groups.

## Electrical power devices

### Material situation

#### Electrical power devices managed by PKP Polskie Linie Kolejowe S.A. in 2016 in comparison with 2015

Item	Unit of measure	Year	
		2015	2016
<b>Traction network devices:</b>			
Length of electrified railway lines	km	11 795	11 826
Length of traction network	tkm	24 744	24 742
Traction network disconnectors	items	20 183	19 908
including controlled	items	13 264	12 901
<b>Direct current devices 3 kV (leased by PKP Energetyka S.A.):</b>			
Traction substations/sectional cabins	items	11	11
Modernised traction substations/sectional cabins	items	26	26
<b>Electric heating of turnouts (eor):</b>			
Single turnouts, including locking devices	items	29 673	32 681
<b>Points of external lighting:</b>			
Points of external lighting	items	195 262	197 634
Installation points and internal lighting	items	196 754	188 757
<b>MV distribution lines:</b>			
Non-traction lines (NTL)	km	710	710
<b>Electric power delivery points:</b>			
Number of electric power delivery points	items	16 139	16 351
Contracted capacity	kW	340 944	359 872,4

## Assessment of the technical condition of the traction network devices and the external lighting

Adopted scale of assessment of the technical condition of the traction and outdoor lighting equipment:

1. good condition – modernized equipment with acceptable degree of wear; their technical condition enables further safe operation;
2. sufficient condition – equipment requiring minor and point repairs; their technical condition enables further safe operation;
3. unsatisfactory – equipment eligible for renovation/modernization; the technical condition of the equipment enables their further operation with increased diagnostic supervision;
4. inadequate condition – which due to poor technical condition should be subjected to a complete renovation (modernization). They can be operated with increased diagnostic supervision and more intensive maintenance activities.

### Technical condition of the traction network devices and the external lighting

Item	Technical condition	2016
		%
Traction network	Good	22,6
	Satisfactory	43,8
	Unsatisfactory	29,1
	Inadequate	4,5
External lighting equipment	Good	33,3
	Satisfactory	32,0
	Unsatisfactory	16,51
	Inadequate	18,13

Due to the change in the methodology of the technical assessment of the traction network and external lighting, it is impossible to compare the technical condition of these elements of infrastructure in 2016 with the previous years.

Starting from 2016, the technical condition of the traction network and outdoor lighting equipment will be determined by the result algorithm.

## Traction network

### Technical characteristics of traction network

Traction network devices	Technical condition			
	Good	Satisfactory	Unsatisfactory	Inadequate
Number of tkm	5 582	10 840	7 211	1109

The use of the above-mentioned result algorithm combines in its methodology the operating life and the wear of the infrastructure elements. It can be justified by the fact that the operation and quality of maintenance of the materials and technologies used have a direct impact on the technical condition of infrastructure. Excessive overloading with

operating current causes the degradation of messenger wires and electrical connections. In recent times, climate conditions have gained particular importance, as their high variability puts isolators at risk of high internal stress, thus exposing them to a higher risk of damage.

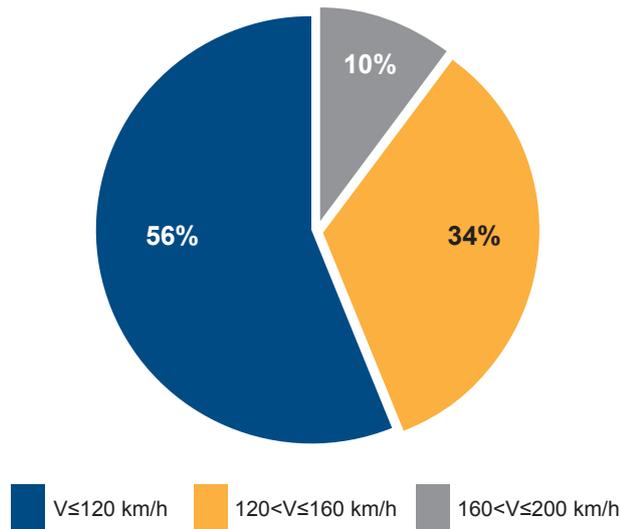
### Traction network broken down by speed

Network devices	160 <V ≤ 200 km/h	120 <V ≤ 160 km/h	V ≤ 120 km/h
Number of tkm	2 474	8 412	13 856
Share expressed in %	10%	34%	56%

The breakdown of the traction network based on operating speed is related to the intensity with which traction network infrastructure is used. Higher speed railway lines

are made available for more trains, which can achieve higher speeds, thus placing a dynamic load on the traction network.

**Traction network broken down by speed**



**Technical condition of the electric heating of turnouts (eor)**

Adapted scale of assessment of technical condition of eor devices:

1. good condition – this grade is given to equipment that meets the following criteria:
  - current period for which equipment has been in operation does not exceed 50% of the anticipated operation period;
  - equipment that has the technical and operational parameters that are compliant with the standards and requirements established for such equipment;
  - equipment that does not require renovation, with the exception of renovation resulting from normal operational wear and tear.
2. satisfactory condition – this grade is given to equipment that meets the following criteria:
  - current period for which equipment has been in operation is between 50% and 100% of the anticipated operation period;
  - equipment that has the technical and operational parameters that are compliant with the standards and requirements established for such equipment; devices require replacement of worn elements as part of scheduled repair/renovation work.
3. unsatisfactory condition – this grade is given to equipment that meets the following criteria:
  - the anticipated operation period has been exceeded;
  - the technical condition of equipment permits its safe operation;
  - equipment requires comprehensive modernization or renovation work.
4. inadequate condition – this grade is given to equipment that meets the following criteria:
  - given the degree of its use, equipment fails to meet the required technical and operational parameters;
  - due to the risk of breakdown and safety risk, equipment should be put out of service.

**Technical condition of the electric heating of turnouts (eor)**

Item	Technical condition	2015	2016	2015 vs. 2016
		%	%	%
Electrical heating of turnouts	Good	45,1	48,4	3,3
	Satisfactory	54,1	49,9	-4,2
	Unsatisfactory	0,8	1,7	0,9
	Inadequate	0	0	0

Evaluation of the technical condition of eor devices uses a methodology, which to a great extent consists of specifying the technical condition of these devices, which is

based on the subjective assessment of the diagnostician or inspector diagnostician who conducts the assessment.

## Non-traction electrical power devices

Electrical heating of turnouts (eor) is being systematically equipped with weather stations, which streamline their proper utilisation. This results in significant reduction of energy consumption. At present, 67% of electrical heating of turnouts (eor) is controlled automatically, whereas the rest is controlled manually.

Another way to raise the efficiency and reliability of electrical heating of turnouts (eor) is to replace old transformer boxes which due to the high rate of separating transformer thefts had to be regenerated or welded on multiple occasions. However, reconstruction does not fully restore their tightness and durability, therefore they have to be

replaced with new, sealed boxes made from composite and equipped with an installation that signals when the cover is opened.

The year 2015 witnessed the continuation of the programme consisting in the replacement of external lighting fixtures and poles. As part of renovation work and the programme aimed to improve energy efficiency, 1,148 fixtures were replaced with power efficient units along with 721 light poles. These measures ensure proper lighting of railway areas as well as help reduce power consumption by approx. 350 GWh/year.

## Power consumption and energy costs

As part of its core activities, PKP Polskie Linie Kolejowe S.A. purchases energy throughout the entire country. Electricity consumption in 2016 was 261,000,000.0 kWh (261 GWh). In 2016, the purchase of electric power for structures and equipment has been carried out through 16,351 electrical power delivery points (ppe) for which more than 359,872 kW of electric power has been ordered; therefore, mean electric power consumption for the years 2002-2016 amounted to approx. 261,000,000.0 kWh (261,0 GWh).

The Company experiences a high number of changes to the number of electric power collection points under its management and the volume of power consumption. In 2016, the number of electric power collection points under the Company's management, covered by the agreement for the supply of electric power for the years 2016-2017, has increased by 212 items (compared to 2015). The above changes were influenced by the ppe created in the framework of operation of the modernised infrastructure (i.e. Łódź Fabryczna Railway Station).

### Description of electrical connections in the Company - as of 31 December 2016

No.	Tariff group	Data of electrical connections in the Company	
		Number	Power
		[Pcs.]	[kW]
	1.	2.	3.
1.	C11	4 827	65 024
2.	C12a	8 285	115 049
3.	C12b	1 289	14 788
4.	C12w	1	11
5.	C21	1 244	98 217
6.	C22a	546	43 411
7.	C22b	96	7 625
8.	B11	33	309
9.	B21	8	1 602
10.	B22	6	3 812
11.	B23	10	10 011
12.	G11	2	8
13.	Lump sum	4	6
<b>Total</b>		<b>16 351</b>	<b>359 872</b>

The contracted capacity has increased by approx. 18,900 kW in relation to the modernized infrastructure put into service (contractual capacity has increased by 18,928 kW, from 340,944 kW as at the end of 2015 to 359,872 kW as at the end of 2016).

Due to the significant increase in contracted capacity of power connections, in subsequent years it is anticipated

that power consumption and, therefore, the cost of electricity will increase.

PKP Polskie Linie Kolejowe S.A. is taking numerous measures to improve the Company's energy efficiency. Main direction of measures undertaken by the Company are the guidelines of the Programme for the improvement of

energy efficiency adopted by the Management Board of the Company on 9 September 2014. As part of the Programme measures are being implemented to improve energy efficiency in all possible areas of activity, so as to reduce power consumption and energy costs. In 2016, a total of PLN 2,860 thousand has been allocated for measures resulting from the Programme for the improvement of the Company's energy efficiency.

Examples of implemented actions within the Program:

1. exchange of energy-consuming devices (mainly lighting) - 1070 pcs.;
2. reactive power compensation - 70 structures;
3. installation of devices for controlling, regulating and stabilising light output of gas-discharge lamps - 130 pcs.;
4. the thermal modernization of buildings - 5 structures;
5. organising and carrying out training within the scope of PN-EN ISO 50001: 2012 standard - "Energy management systems".

The training was intended for those who hold positions of supervision over the energy economy and the aim is to prepare candidates for the function of internal auditor of the Energy Management System (SZE) in the Company. After completion of the training, the participants acquired

the skills of self-planning and conducting internal audit of the SZE in a manner consistent with the ISO 19011 standard and the certification of the correctness of the functioning of the SZE with the requirements of the ISO 50001 standard. 30 people attended the training.

6. design and execution of three brand new photovoltaic installations (PV) at the premises of the Railway Lines District Unit in Lublin;
7. development of devices (3 objects) using renewable energy sources at the premises of the Railway Lines District Unit in Ostrów Wielkopolski, Poznań and Opole;
8. conducting a pilot thermomodernization of the building of the interlocking signal tower at Gostyń railway station with the use of infrared illuminators and photovoltaic system to supply power to the building;
9. carrying out a training cycle from the Energy Efficiency Improvement Programme in the Company's organisational units. Training was provided by the staff responsible for the power sector within the individual units in order to acquire the necessary knowledge and skills in the field of energy efficiency improvement;
10. preparation of lighting platforms at the stations: Kielce, Włoszczowa, Miąsowa, Zagnańsk, Potok, Łączna, Suchedniów for outdoor lighting;
11. other activities involving 74 facilities, consisting in the modernization of lighting, modernization of heating and change of tariff groups.

### **As part of standardization, research and development of the energy industry, the following has been done in 2016:**

1. The "Guidelines for the implementation of energy audits of facilities and equipment" let-10 were adopted to be used in the Company. The guidelines indicate the manner in which energy audits are carried out, which include procedures for acquiring adequate knowledge of the current consumption of energy carriers by buildings and equipment that are part of the railway infrastructure. The guidelines show the way of conducting analyses in the area of specifying the energy consumption of buildings and equipment that are part of the infrastructure of railways. They also specify and indicate the implementation of measures leading to an increase in the energy efficiency of railway infrastructure;
2. Updated databases in SQL environment and algorithms for assessing the technical condition of the traction network and outdoor lighting equipment;
3. 25 testing grounds for testing new equipment before it is put into service on railway lines managed by the Company have been established and 11 technical approval certificates have been issued for new equipment;
4. An analysis of power supply and traction network parameters was carried out in the context of compliance with TSI ENER CR requirements on lines managed by PKP Polskie Linie Kolejowe S.A.;
5. Work on the development of design and acceptance guidelines for the examination of the return network for traction networks with operating currents up to 3200 Amperes;
6. Activities aimed at working out "Guidelines for the design of outdoor lighting equipment for the areas managed by PKP Polskie Linie Kolejowe S.A." were undertaken - in the field of commissioning of experimental polygons to determine the standard of communication in control of external lighting devices. The position developed and adopted as part of the above solution is control system implemented based on the DALI protocol. The possibility of using a central dynamic passenger information system (CSDIP) to control outdoor lighting was also considered.

### **Other important events that have a significant impact on the Company's operations that occurred in 2016 or are anticipated in the following years:**

1. Continuation of activities aiming at the maintenance services for non-traction power equipment;
2. Conclusion of an annual contract for the maintenance of electrical installations and internal lighting in the premises and external lightning protection installations;
3. Continuation of the program of replacement of traction network for composite insulators of traction network;

4. Continuation of the programme of exchange of lighting poles and fittings, especially for fittings in LED technology;
5. A two-year contract for the purchase and delivery of light sources for the complete replacement of light sources;
6. A development of "Study presenting possible scenarios of implementation of the provisions of the Act of 20 May 2016 on energy efficiency by PKP Polskie Linie Kolejowe S.A.". The study was conducted to present possible scenarios for the implementation of the above-mentioned requirements of the Act by PKP Polskie Linie Kolejowe S.A. together with the estimation of the costs of implementation of each of the scenarios presented. Study guidelines will be the basis for the description of the subject matter of the order in order to select a consultant performing the audit in the Company.
7. Completion of works on the Power Delivery Points Management System (SZPPEE).
8. The system includes the passporting of all power delivery points along with the assignment to the POS location. Enables the registration of energy agreements, settling the electricity invoices, creation of BATCHMAN files. The SZPPEE System has reporting functions supporting optimisation of the costs of purchase and consumption of electrical power. It is an independent application in the POS environment.

The purpose of SZPPEE is to implement tools for effective management of power delivery points, to optimise the costs of purchase electrical power in the Company. The implementation of SZPPEE will help in the implementation of subsequent changes of the electrical power supplier, based on the TPA principle (free-market electricity purchase), including the transmission of measurement data on energy consumption by individual power delivery points.

## Track Machinery Plant

### Operation of high-performance track machinery, restoration of rails and machine repairs

The Track Machinery Plant in Kraków is a specialised organisational unit of PKP Polskie Linie Kolejowe S.A. which carries out tasks comprising ongoing repairs, maintenance of railway lines and engineering structures as well as investments.

The plant has specialist machinery and equipment as well as process lines for restoring and welding rails into up to 210 m long sections. The maintenance of railway lines and engineering structures along with investment tasks are implemented using high performance specialist machinery for track and track bed work. What is crucial in the case of machinery groups is that repairs are carried out in a single take, without the need to disassemble the railway track, this significantly reduces the repair time and helps maintain uniformly high railway track parameters. This is especially important in the context of environmental

protection and impact on areas adjacent to railway lines: there is no need to disturb the structure of the areas adjacent to the section under repair, to destroy access roads or to establish haul roads for transporting materials and spoil. Rails are restored at a specialist unit – the Rail Welding Section in Bydgoszcz. Workshops of the Track Machinery Plant in Cracow perform repairs of the P2, P3 level of railway vehicles and the planned repairs of machines and track laying machines.

Track machines and welding machines are operated by a highly experienced and qualified team of workers, which ensures that the quality of performed work meets the most stringent expectations of clients. To confirm the quality of services provided, the Plant has obtained the ISO 9001:2008 certificate.

### Operation of track machines from the Track Machinery Plant in Kraków in 2016

Machine	Quantity	Unit of measure
AHM 800 R	29 423	mb
P-93 i P-95	198 563	mb
OT-800 i RM 80	174 181	mb
CSM 09	365 977	mb
ZTU 300	104 595	mb
DGS 62 N	361 712	mb
UNIMAT [j.r.]	1 179	j.r.
UNIMAT [m.b.]	71 122	mb
USP [j.r.]	258	j.r.
USP [m.b.]	499 917	mb

## Diagnosics

Diagnostic measurements and tests are the basis for assessing the technical condition of railway infrastructure and planning maintenance and repair processes.

During these processes current technical parameters of infrastructure components are determined to analyse their compliance with prescriptive standards and established safety tolerances. Diagnostics and assessment of the technical condition of railway infrastructure are handled by:

1. diagnosticians employed at Railway Lines District Units who – using portable tools and devices – make measurements and tests of subgrade, track superstructure,

engineering structures, railway buildings and structures as well as power and railway traffic control command and signalling equipment and networks;

2. Diagnostics Centre in Warszawa – a specialist unit carrying out measurements and diagnostic tests using specialised equipment on bogies, rail vehicles and rail-road vehicles.

The Diagnostics Centre in Warszawa ensures railway traffic safety of the network managed by PKP Polskie Linie Kolejowe S.A. by making measurements and analysing the technical condition of railway infrastructure in six areas:

**In 2016, 250 employees of the Diagnostics Centre performed – as part of their primary business – among others:**

No.	Task	Quantity	Unit of measure
1.	Measurement of horizontal and longitudinal track geometry in plan and profile, using two EM 120 measuring vehicles and the UPS-80 special vehicle	46 319	km of tracks
2.	Inspection of internal rail structure in a track using a track defect detection wagon	13 779	km of tracks
3.	Inspection of internal rail structure in a track using a track defect detection bogie	42 440	km of tracks
4.	Defect detection test on railway track elements	Welds	1 026 items
		Padding welds	86 items
		Turnouts Crossings	1 618 items
	Specialist test on railway track elements	Longitudinal rail profile	97 096 items
		Transverse rail profile	22 597 metres
			1 292 items
		Running surface courseness	3 315 items
Rigidity of rails and crossings	10 items		
5.	Control of operation of axle welding sensors using defect detection wagon (dSAT) which simulates an axle-box breakdown	330	devices
6.	Participation in bridge structure inspections using a specialist Volvo - SRS Svabo vehicle, for the purposes of inspectors from Railway Lines District Units	158	structures
7.	Lab and field tests of rail welding joints	Lab - 168	samples
		Field - 152	items
8.	Training and courses in rail welding and welding supervision	103	people
		16	courses
9.	Periodic and certification exams in rail welding	249	people
10.	Instruction and issuing of competence certificates, identification cards for welding supervision	200	items
11.	Gauge measure calibration	978	items
12.	Technical acceptance of railway track elements	Turnouts	522 sets
		Various components for turnout production	103 items
13.	Technical acceptance of railway track elements in the field (e.g. with a digital rod)	Thermite welds and welds	760 items
14.	Relay maintenance	Own units	47 127 items
		External units	45 105 items

1. diagnostic measurements of track superstructure (track geometry) and rail road infrastructure components (clearance outline), measurements of longitudinal and vertical rail profiles (the so-called waviness) and other specialist measurements, e.g. coarseness or rigidity;
2. defect detection in steel elements of superstructure (looking for and revealing surface and internal flaws and defects in rails, elements of turnouts and in rail joints);
3. functional diagnostics of defect detectors by simulating rolling stock emergency conditions using special apparatus installed on the track geometry car;
4. welding of rails and turnouts – supervision, control and assessment of performed rail joints as well as field and lab tests of the quality of joints;
5. acceptance of railway track elements of required quality to be used in railway infrastructure;
6. relay maintenance (RM) for relays used in signalling and train control systems.

Gaining information about railway infrastructure parameters is the basic activity of the Diagnostics Centre; its tasks are planned on an annual basis in compliance with obligatory regulations and demand from the Company's maintenance units. In 2016, numerous undertakings and initiatives related to the development of the Diagnostics Centre were continued to be implemented, taking into consideration the pursuit of technological progress in the field of railway infrastructure diagnostics in order to ensure technical safety for passenger and freight transport. These undertakings and initiatives included, among others:

1. the consultation and supervision of a contract with the Polish-Italian consortium for the construction, delivery and implementation of a multi-function, self-propelling rail measuring vehicle for measuring the geometry of tracks, rails, traction network as well as inspecting railway superstructure and track-side devices. It is planned to accept the vehicle and commence its operation in 2016; obtained results will expand the scope of currently performed diagnostic tests performed on infrastructure by measurements from the energy and railway automatic control industry;
2. the consultation and supervision of the agreement for the construction, delivery and implementation of a self-propelling diagnostic vehicle for rail defect detection. It is planned to accept the vehicle and commence its operation in the middle of 2018;
3. as part of the proper maintenance of the relays used in the signalling and train control systems, 22 agreements signed between 2015 and 2016 for the maintenance of 45,105 of these devices were supervised;
4. the Diagnostics Centre, as every year, was a promoter of modern methods and technologies by organizing a number of presentations of measurement equipment addressed to the representatives of Railway Lines District Units and maintenance companies.
5. the following elements were bought:
  - set of reference devices verifying railway rail grinding works;
  - portable devices used for testing fatigue and contact defects, which detect dangerous defects caused by the fatigue of the running surface material at the working place of the wheel and rail;
  - device for measuring the thickness of the removed material layer with an accuracy of 0.015 mm;
  - longitudinal rail profile measuring device enabling measurements to be made with the highest possible reliability of the obtained results due to the need to perform planned diagnostic tasks and the effectiveness of supervision over maintenance of a very high level of work carried out in the railway infrastructure, others by contractors selected in the context of tendering procedures.

Consistent activities in the form of continuous monitoring, inspection and commissioning of works in railway infrastructure and the continuous diagnosis of its condition, affect the quality of the works performed, raise the level of safety and increase the comfort of the passengers of railway journeys.

## Passenger Service Facilities

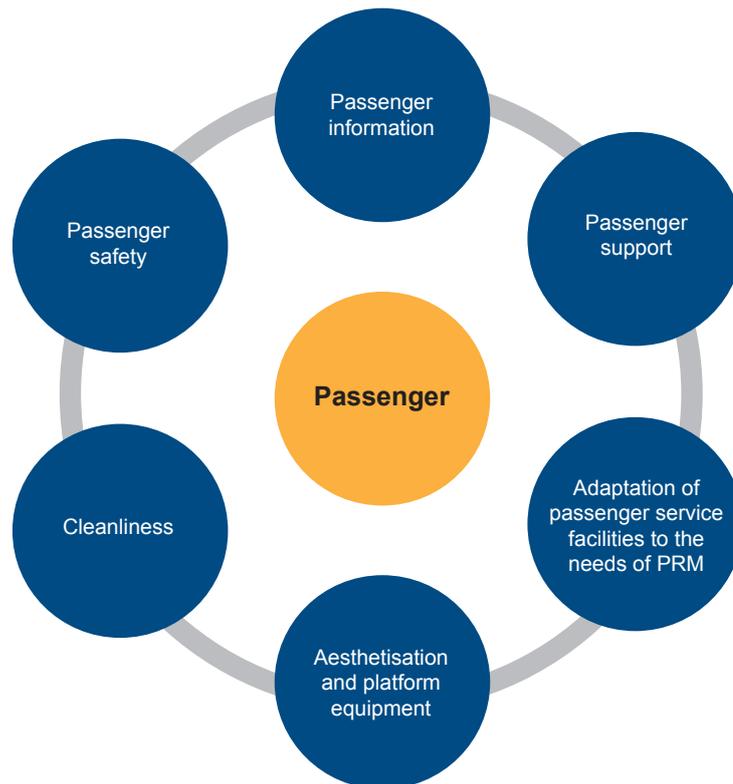
PKP Polskie Linie Kolejowe S.A., having regard to the need to ensure appropriate access to information by passengers, safe and comfortable conditions in which passengers may wait for the train to arrive as well as safe and comfortable travel conditions, undertakes a number of initiatives to ensure a high standard of passenger service facilities, understood as the platform area and platform access routes at stations and passenger stops that are open for passenger traffic.

These initiatives are undertaken mainly in the following areas:

1. passenger information;
2. platforms and platform access route equipment and

- improvement of the aesthetics of infrastructure with which passengers come into contact on a daily basis;
3. adaptation of passenger service facilities to meet the needs of disabled persons and persons with reduced mobility, (Persons With Reduced Mobility - PRM);
4. maintenance of order and cleanliness at stations and passenger stops;
5. services provided in order to raise the comfort of travel, including services related to the coordination of the actions of the engaged entities taken to support passengers in situations caused by disruptions to railway traffic;
6. ensuring the safety of passengers present at stations and passenger stops managed by the Company.

## Tasks implemented in relation to passenger service facilities



### Passenger information

The process of improving standards concerning the publication of train timetables has been continued in 2016, so as to develop a uniform method for presenting information on the timetable at all stations and passenger stops open to passenger traffic and ensure proper access to this information. The printing technology of poster train timetables was changed from inkjet to laser method. Using this solution ensures better print quality and increased durability of posters.

More than 1000 information boards have been purchased and installed at approx. 600 locations, in order to ensure the best possible availability of information.

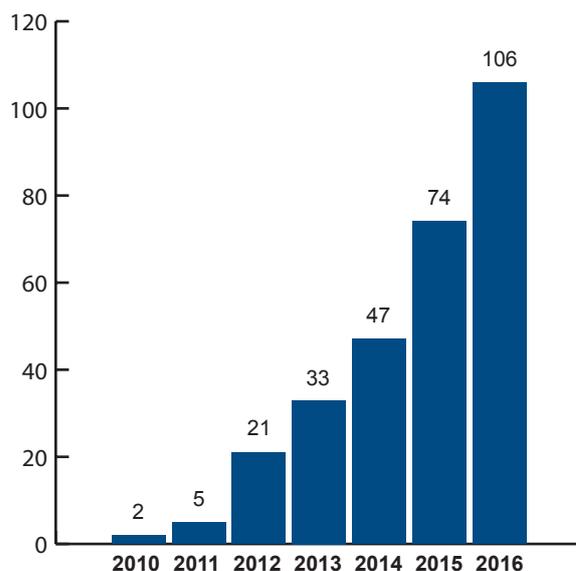
In 2016, PKP Polskie Linie Kolejowe S.A. implements the process of standardizing static information for passengers to the standards adopted by the Company, consisting in the successive replacement of fixed markings: signs with passenger stop names, platform and track numbers, directional signs, pictograms. In 2016, new markings have been installed in more than 500 locations.

The dynamic voice announcement service (megaphone announcements) is provided at 1,333 locations with more than 2,785 structures handling passenger traffic. In nearly 320 locations, megaphone announcements are made using automatic systems, whereas in the remaining locations with a broadcast system – directly by the train dispatcher or operator.

More than 150 locations, apart from broadcast systems, is additionally equipped with systems for presenting dynamic visual information on train traffic, in 70 of which these are newer generation systems. It is planned to install another 20 systems by the end of 2017.

In addition, during the World Youth Day (WYD) megaphone announcements in foreign languages were made at the stations and stops where foreign pilgrims were arriving, as well as dynamic visual information using large format displays outside the railway area was provided i.e. in the surroundings of railway stations in Kraków.

## Number of stations and passenger stops equipped with newer generation Dynamic Passenger Information Systems



Having regard to the obligation to ensure a uniform high standard for the presentation of information and, in consequence, raise the quality of passenger service, the Company developed and implemented a central application controlling dynamic passenger information (CAS-DIP) which will allow to manage all planned dynamic passenger information systems (SDIP) at a level suited to growing passenger needs. At the turn of 2016 and 2017, dynamic passenger information systems controlled by CASDIP application were implemented at Jelenia Góra and Zielona Góra stations.

Further on, works will be conducted on integrating dynamic passenger information systems that are currently in operation.

One of the key components of CASDIP is the central voice announcement server which makes it possible to provide premade, high quality announcements in four languages

to all megaphone-based broadcast systems through speech synthesis. At present, works are underway on the development of statement of work and tendering documentation for the delivery of applications and dedicated voices that meet the Company's requirements. Improvements made in this area will allow to minimise the responsibilities of train dispatchers concerning voice announcements on small stations and passenger stops. Moreover, the installation of visual dynamic passenger information systems in areas where previously only voice announcements were made will significantly facilitate travel:

1. for hearing-impaired passengers;
2. foreigners for whom it is practically impossible to understand even a small part of the voice announcement made in polish;
3. other passengers, due to the "transient" nature of voice announcements.

## Visual monitoring

In recent years, public transport has become exposed to various threats, such as: terrorism, theft, vandalism. The railway services sector faces a problem consisting in the need to ensure the safety of passengers, employees, goods, infrastructure and assets against possible threats. Facing this problem is a serious challenge due to the variety of areas subject to monitoring: platforms, underground passages, railway station buildings as well as parked wagons and locomotives.

The Company carries out actions aimed to ensure the safety of passengers at stations and passenger stops through visual monitoring systems and responding to

emergency alerts made by passengers by ensuring communication between passengers and services responsible for maintaining order and cleanliness and providing support.

At present, 153 locations are equipped with the Visual Monitoring System, of which 135 are equipped with a visual monitoring systems owned by PKP Polskie Linie Kolejowe S.A. (which include: 1,242 cameras, 112 video recorders). The number of locations equipped with the Visual Monitoring System has increased by approx. 40% compared to the previous year.

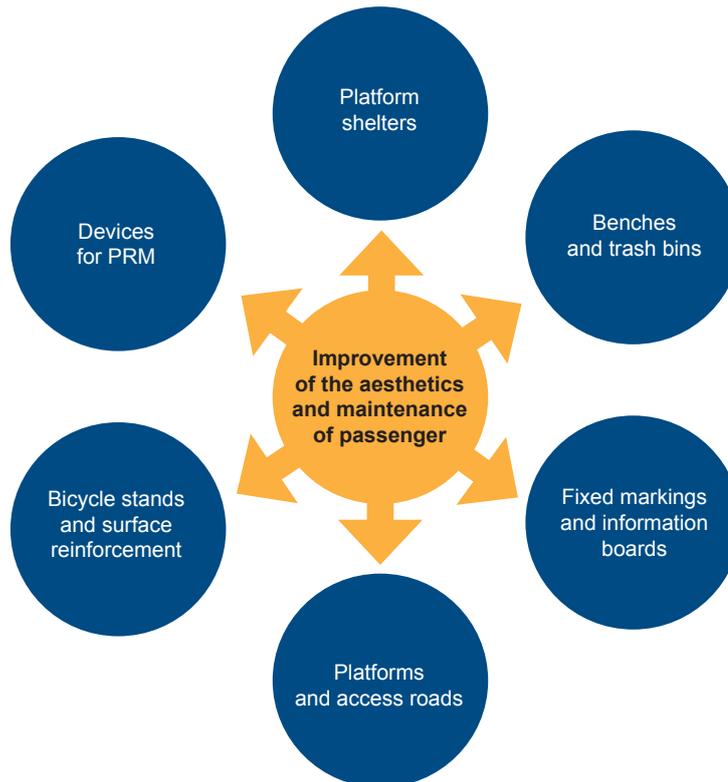
## Names of stations and passenger stops

Due to the continuation of the works on the improvement of the quality of passenger information in terms of stations and terminals by ensuring their coherence with the names of towns/cities in which they are located, a list of over 180 station names and stops, which are eligible for correction e.g. during modernization works, has been created.

In addition, in 2016, there are 7 new names of stops, i.e.: Mokre, Wólka Orłowska, Gdynia Karwiny, Gdynia Stacja, Zaborów Błonia, Jasło Fabrycz, Kraków Bronowice and the name of Stargard Szczeciński has been changed into Stargard.

## Equipment of platforms and platform access routes

### Tasks implemented as part of improving the aesthetics of passenger service facilities



In 2016, PKP Polskie Linie Kolejowe S.A. implements standards in the area of planning, designing and constructing railway infrastructure used to manage passenger traffic by ensuring:

1. high functional and utility standards, including availability to persons with reduced mobility;
2. efficient maintenance and repair of components comprising passenger service facilities;
3. aesthetic structures comprising passenger service facilities;
4. respect for the surrounding area, in particular cultural heritage sites;
5. high quality and durability of components comprising passenger service facilities;
6. respect for the natural environment;
7. solutions of a standardized and foreseeable nature, having regard to persons using rail transport.

Actions undertaken are aimed to ensure that passenger service facilities are characterised by high aesthetic, technical and functional standards.

In 2016, a number of measures have been implemented with the aim to improve the comfort of waiting for trains to arrive on stations and passenger stops:

1. more than 230 platform shelters have been purchased and installed in over 160 locations;
2. more than 210 shelters have been restored or renovated in over 100 locations;
3. approx. 1,410 trash bins have been purchased and installed in over 470 locations;
4. approx. 1,180 platform benches have been purchased and installed in over 390 locations;
5. approx. 1,380 bicycle stands have been purchased and installed in over 330 locations.

In addition, due to the WYD taking place in 2016, the attention has been paid to the stations and stops used by the biggest amount of travelers (pilgrims).

## Adaptation of passenger service facilities to meet the needs of disabled persons and persons with reduced mobility

The Company undertakes actions aimed to gradually eliminate architectural barriers at stations and passenger stops, so as to adapt them to meet the needs of disabled persons and persons with reduced mobility. From January 2016, the Company co-operated with PKP S.A. in the area of provision of assistance to people with reduced mobility on 61 railway stations. Platforms and platform access routes modified in 2016 as part of railway line modernization have been equipped with wheelchair ramps as well as elevators and platform lifts. The Company con-

tinued to equip platforms with elements facilitating orientation and movement for blind persons.

In 2016, i.e. 53 platform lifts situated near stairs and 67 elevators have been installed, 80 ramps, 28 escalators and 8 moving belts have also been constructed and more than 150 platforms have been equipped with tactile warning strips.

The Company's actions in this area are a response to the growing needs of passengers and operators in terms of quality of access to railway transport.

## Maintenance of order and cleanliness at stations and passengers stops

In 2016, the first common project with PKP S.A. was completed. The project concerning cleanliness at the stations and stops. This initiative resulted in commissioning the service in areas managed by both Companies to a single contractor, setting out a quality standard and standardization of procedures applicable for this area in both Companies. This approach constituted a complete move away from the approach consisting in the maintenance of cleanliness using own resources. It resulted in a significant increase in the cleanliness of the passenger service facilities, which was the justification for the decision to continue the project in the 2016-2018 perspective.

In the entire area covered by the project of mutual maintenance of order and cleanliness the "Book of Standards for Maintaining Railway Stations and Stops Managed by PKP in Clean Order" is in force. The Book describes in detail the required standard of cleanliness for each element of passenger service facilities. It stipulates that the service must be performed in accordance with the SLA (Service Level Agreement) method, i.e. the agreed quality of services being provided must be maintained on a continuous basis and systematically improved.

The performance of the service consisting in maintaining cleanliness includes, inter alia:

1. mechanical and manual washing of passenger service facilities;
2. sweeping and vacuuming flat surfaces and stairs, including handrails and guardrails;
3. washing benches and tables;
4. maintaining walls and information boards in clean order;
5. washing all windows and glazings;
6. removing graffiti, stickers, gums, trash, stains, waste, sand and dust;
7. keeping drainage grates unobstructed;
8. emptying trash bins;
9. maintaining tracks and intertrack space in clean order;
10. removing excrement;
11. clearing of snow and removing slippery surfaces from platforms and access routes;

12. removing snow overhangs and icicles;
13. maintaining green areas, including mowing lawns.

In order to ensure the possibility of controlling the quality of provided services, an audit structure comprised of over 100 auditors of PKP Polskie Linie Kolejowe S.A. country, has been developed. In the audit process, mobile devices with dedicated applications are used to view the results of audits of the contractor and the auditors of both companies in real time so that a quick response to the deficiencies can be made.

The year 2016 saw the continuation of measures aimed to guarantee a high standard of cleanliness in passenger service facilities located on stations and passenger stops. The service consisting in the maintenance of cleanliness, commissioned to external entities, is provided in over 2,500 locations managed by PKP Polskie Linie Kolejowe S.A. (and covers a total area of approximately 22 million square meters).

Main measures implemented in 2016 include:

1. preparation and carrying out of the tendering procedure for the project concerning the maintenance of cleanliness in the 2016-2018 perspective, resulting in conclusion of contracts with external contractors;
2. development of new standards of cleaning services (updating the "Book of Standards of Cleanliness of Stations and Railway Stops of PKP", i.e. to increase the required level of service);
3. the intensification of quality control measures with regard to the service being provided in periods of higher passenger traffic flow, especially during the winter holiday break and holidays;
4. the coordination of preparations for the winter period, including for the use of special measures to de-ice and clear snow from platforms.

## Commercial development of passenger infrastructure

In 2016, "Guidelines on the coordination of passenger infrastructure managed by PKP Polskie Linie Kolejowe S.A." were adopted. The aim of the document is to regulate

activities related to the development of commercial and service space at the passenger railway stations.

### Customer Satisfaction Patrols (CSP)

In July 2016, the project entitled "Customer Satisfaction Patrols – a study on quality parameters of services provided to customers of the PKP Group" – was completed. The main purpose of the project was to enhance the comfort of travel to passengers by improving the condition of infrastructure on platforms and platform access routes and raising the standards of services provided to passengers.

CSPs perform quality controls covering the full scope of factors that affect the comfort of travel and customer satisfaction with services provided by Companies from the PKP Group which participate in the project (PKP S.A., PKP Polskie Linie Kolejowe S.A. and PKP Intercity S.A.). The main scope of the study is carried out using the method of „quiet observations” and included the assessment of:

1. the cleanliness of the station and passenger stops along with the infrastructure;

2. technical condition of passenger service facilities, (superstructure, accessory structures, equipment of platforms, railways);
3. consistency of passenger information, i.e. the consistency of voice announcements;
4. sense of safety on the railway area, e.g. presence of security personnel.

In total, over 4,377 inspections were conducted in more than 460 locations at all stages of the project.

From mid-2016, the technical condition of the passenger infrastructure and maintenance of cleanliness is carried out exclusively within the own resources of PKP Polskie Linie Kolejowe S.A. From 1 July to 31 December 2016, a team of field auditors conducted 1,395 audits on 1,161 passenger stations.

### Customer Support Centre (CSC)

Since 2014, CSC has continued to operate, a joint initiative of PKP S.A., PKP Intercity S.A. and PKP Polskie Linie Kolejowe S.A.

The CSC employees monitor the current situation on the railway network, in trains and at stations round-the-clock.

In emergency situations such as train delays, journey cancellations or equipment failure on the train, they shall immediately take measures to minimise the effects of the accident, both for passengers on the train and for those waiting for the train at the railway station. Current information on disturbances in train traffic is provided by press spokesmen of the companies forming the CSC.

The CSC organizes the distribution of warm or cold drinks in delayed trains at the largest stations in Poland, it participates in the organisation of communication and replacement communication, monitors travel of disabled people (help, assistance) and organised travel groups (colony, supporters), supports them in demanding situations and undertakes many other nonstandard activities to ensure the highest quality services.

In 2016, the CSC was mainly focused on the journeys of organised groups of participants during WYD. The CSC monitored journeys of special train, the situation at the stations and the quality of passenger information at that time.

# Safety

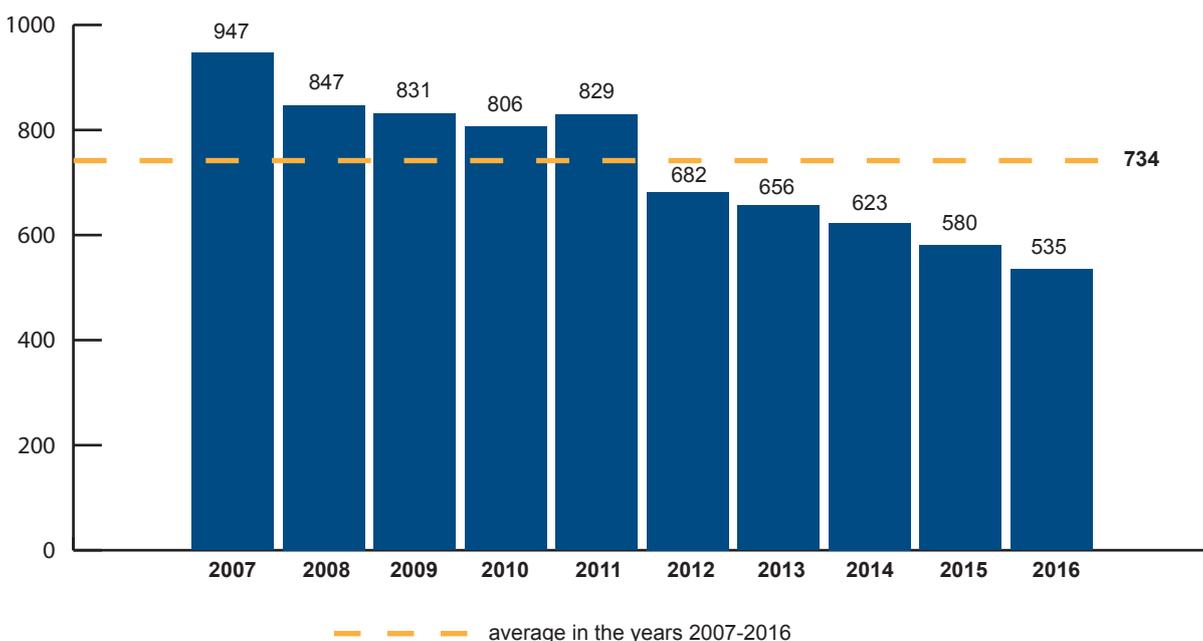
## Statistics of railway events (as at 3 July 2017)

### Railway events by category

535 accidents (excluding suicides) occurred on the railway line network managed by PKP Polskie Linie Kolejowe

S.A. between 1 January and 31 December 2016. In comparison to 2015, the number of events dropped by 45.

Comparison between the numbers of events that took place on the railway lines managed by PKP Polskie Linie Kolejowe S.A. in 2007-2016

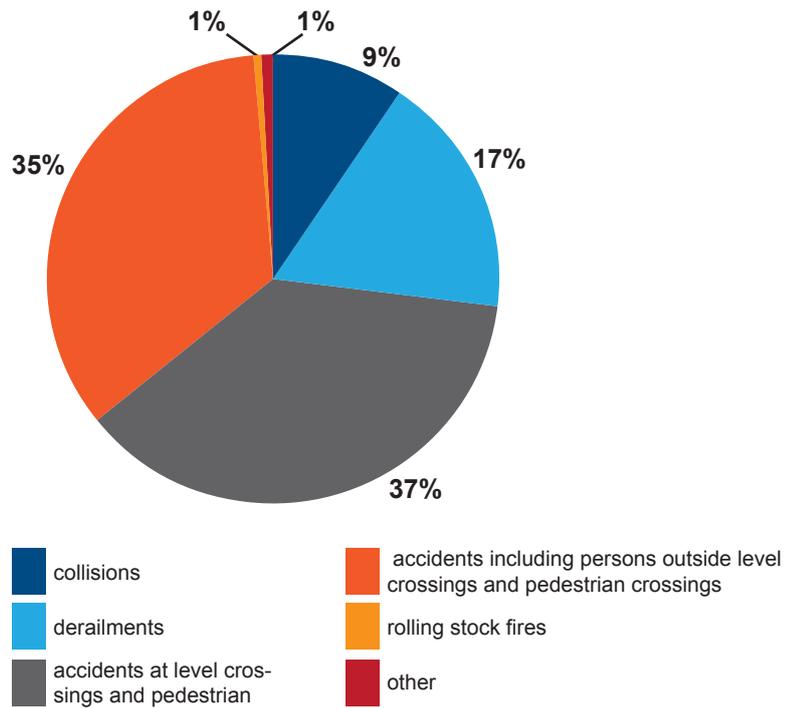


### Accidents and serious accidents by type

The railway accidents classification method used by PKP Polskie Linie Kolejowe S.A. compliant with the requirements of the Office of Rail Transportation (UTK) and the European Railway Agency (ERA) covers:

1. collisions;
2. derailments;
3. accidents at level crossings and pedestrian crossings;
4. accidents including persons outside level crossings and pedestrian crossings (excluding suicides);
5. rolling stock fires;
6. other accidents.

**Quantitative structure of accidents on the network managed by PKP Polskie Linie Kolejowe S.A. in 2016, by type**



The diagram above shows that the most numerous group of accidents that took place on the network managed by PKP Polskie Linie Kolejowe S.A. were the accidents that involved persons outside level crossings and pedestrian crossings (persons who were on railway premises and were hit by trains, or who attempted to jump on/off trains) as well as accidents on level crossings and pedestrian crossings. Collisions and derailments amounted to 26% of all accidents in 2016. They are the events that

usually result from the errors in the entire “railway system”, namely of technical devices, procedures and/or human factor (on the side of the railway operator or infrastructure manager). The possibility to reduce these two types of accidents depends directly on the measures taken by railway market participants (infrastructure managers and railway operators), but also designers, producers, suppliers and contractors providing construction and maintenance services.

**Casualties of railway accidents**

The number of casualties that resulted from accidents that occurred on the railway network managed by PKP Polskie Linie Kolejowe S.A. in 2016 was 255, with 166 fatalities and 89 severely injured. In comparison to 2015, the number of fatalities dropped by 53 while the number of severely injured – by 1.

The largest group of fatalities that resulted from accidents that occurred in 2016 comprised persons with no authorisation to be present on railway premises (115 fatalities – fewer by 45 than in 2015) as well as users of level crossings and pedestrian crossings (48 fatalities – fewer by 5 than in 2014).

As regards persons that were severely injured in railway accidents, the largest group (43 people – fewer by 5 than in 2015) were those with no authorisation to be present on railway premises, while the second largest group were the users of level crossings and pedestrian crossings (37 people – the same as in 2015).

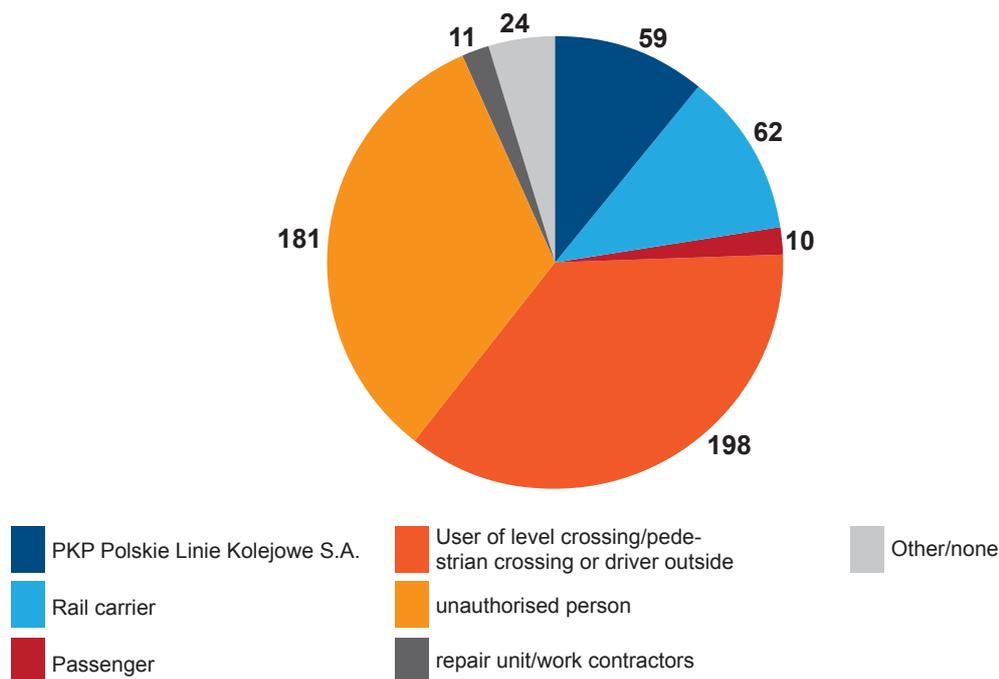
The accidents that caused fatalities in the group of passengers (2) were caused by jumping on/off the train or falling from the railway vehicle.

**Accidents by fault attribution**

In most cases, the parties that were responsible for accidents in railway traffic were the users of level crossings and pedestrian crossings, which is evident in the much higher number of accidents at railway crossings and collisions with pedestrians outside level crossings and pedestrian crossings in the general statistical results related to accidents.

The accidents that caused fatalities in the group of passengers (2) were caused by jumping on/off the train or falling from the railway vehicle.

## Entities responsible for accidents in 2016



In 2016, 59 accidents were attributable to PKP Polskie Linie Kolejowe S.A. (fewer by 6, i.e. 9% than in 2015), including: 10 collisions, 43 derailments, 6 accidents on level crossings. The most frequent cause of events attributable

to the Company was damaged track superstructure or its inadequate condition as well as poor condition of engineering structures.

## Measures taken to improve the safety of railway traffic

### Initiatives to improve the technical condition of infrastructure and equipment

In 2016, PKP Polskie Linie Kolejowe S.A. implement a wide-scale programme for the modernization and revitalisation of railway lines. The scope of works under individual investment projects usually involves the comprehensive replacement of railway tracks, local control command and signalling equipment and electric power equipment (both traction and non-traction) as well as the modernization of level crossings and their removal and replacement with grade-separated junctions. The replacement of old, run-down and degraded railway infrastructure and technical equipment with new infrastructure and equipment made using modern technologies allows to significantly improve the operating parameters of railway lines (mainly maximum permissible speeds) while maintaining the same level of railway traffic security or even improving it. Modernization and revitalisation work carried out on railway lines allows to lower the risk of accidents or service difficulties caused by bad technical condition and/or infrastructure malfunctions. Furthermore, the number of accidents that occur on level crossings is reduced by

equipping crossings in additional safety and user warning equipment (i.e. re-classifying a crossing into a higher category).

Modernization and revitalisation work carried out by the Centre of Investment Implementation covering track superstructure included the replacement and retrofitting of elements that play a crucial role in the prevention of the risk of derailment, i.e. turnouts. 549 turnouts on the network managed by PKP Polskie Linie Kolejowe S.A. have been modernized in 2016.

In addition, preparatory works for a separate investment project were carried out in 2016 to exchange railway turnouts at the selected locations, which is a continuation of the project implemented in previous years. The project "Improvement of safety through the development of new railway turnouts with a higher design standard- stage II" was included in the National Railway Programme (KPK) until 2023. The task is to replace 288 turnouts with accompanying works in the total amount of approximately PLN 200 million.

In addition, one of the tasks to be implemented under the Company's Investment Action Plan in 2016 related to the improvement of safety and operational parameters of trains was to provide turnouts at selected stations with universal switch locks for emergency closing of needles and moving beaks crossings. The planned amount of PLN 5 million enabled the purchase of nearly 3,000 - the contractor also provided over 160 special units to lock keys. As part of modernization and revitalisation projects currently in progress, PKP Polskie Linie Kolejowe S.A. is modifying level crossings and pedestrian crossings, equipping them with additional protection/warning solutions; moreover, level crossings and pedestrian crossings are being removed and replaced with viaducts, footbridges and tunnels. In 2016, the investment activities covered a total of 213 journeys, where in various locations the scope of modernization covered: automatic crossing signaling devices, installation of CCTV equipment and/or replacement of driving surface. In addition, 47 grade-separated junctions were built or modernized. In 2016, preparatory works were also carried out for a separate investment project involving rail and road crossings and track passages in selected locations, which is a continuation of the projects of the 2007-2013 perspective, carried out in previous years. The project entitled "Improvement of safety at crossroads with railway roads" was included in the KPK.

In order to reduce the risk of collisions at rail and road crossings PKP Polskie Linie Kolejowe S.A. has implemented in 2014 and continued in the following years the action consisting in placing warning and slowing signs on roads leading to the crossings. It is important for the driver of a road vehicle that the strips placed on the surface of the road leading to the crossing at an appropriate distance warn him/her about the fact that he/she approaches the railway crossing - a high risk area, where special caution should be exercised. Since the project was initiated till the end of 2016, the markings have been installed on the access roads to 280 level crossings.

Current and planned investments on the railway network managed by PKP Polskie Linie Kolejowe S.A. include the installation of additional defect detectors (dSAT) which detect malfunctions of gear elements and malfunctions

of loading while driving. The dSAT devices (and the procedures for dealing with an emergency situation in a rail vehicle) reduce the risk of derailment and significant damage to rolling stock and infrastructure as well as preventing excessive degradation of the surface. In 2016, the company provided 12 new locations with new devices, and as a result, there were 204 pieces of them at the end of 2016.

In the last 3 years the Company bought equipment and vehicles to provide emergency response measures and eliminate the effects of railway events, including equipment and vehicles bought in 2016:

- 5 rail and road UniRoller-S vehicles, which makes it possible to drive on roads at the speed of up to 90 km/h and on tracks at the speed of up to 50 km/h; where the changeover time from the road system to the train system or vice versa is only 2 to 4 minutes, and the payload of the vehicle (3,100 kg) makes it possible to carry more equipment than in existing vehicles;
- WM15/PRT vehicle, which was put into operation in the Special Technical Emergency Response (SPRT) in Bydgoszcz, which allows for self-rescue actions for a long time and ensures a quick departure to the site of the accident. The company has 5 vehicles and another vehicle will be bought in 2017.

## Increasing safety during investment implementation and other track work

The implementation of investments and other track work requires the closure of track sections. Proper planning and commencement of those operations is crucial from the perspective of safety of the railway traffic carried out on the track located next to the closed track and on other routes and operating control points located next to it. Track closure entails the necessity of introducing appropriate obstructions in the scope of railway traffic and, in case of long-term closures, also changes in train timetables. Under some disadvantageous conditions this may be an additional risk factor. In 2016, there was a total of 44,179 track closures on the network managed by

PKP Polskie Linie Kolejowe S.A. (15% more than in 2015), including 2,791 closures that lasted the whole day. The performance of investment work and other track works in the vicinity of active tracks on which train traffic is operated requires the application of appropriate risk control measures. In the recent years, the Company took a number of steps to improve safety during the implementation of investment projects and other works, both for people working in the vicinity of active tracks and train traffic occurring near work sites. Actions implemented in 2016 in this area included, inter alia:

1. increasing personnel at operating control point during the implementation of investments on the station/line (a total of 23,599 hours);
2. performing thematic audits of the Safety Management System (SMS) concerning railway traffic safety during the performance of investment works (12 audits have been carried out in 2015, 10 in 2016 and it will be continued in 2017);
3. inspections concerning railway traffic safety management in locations where investment works are performed - in 2016 inspectors have carried out over 100 inspections in terms of organisation and completion of closures that lasted the whole day, taking into account: means of securing and signalisation of the places of investment works, maintaining railway traffic safety during the investment works and correctness of the development and application of temporary regulations for railway traffic; continuation in 2017);
4. applying the "Safety rules during the performance of investment, revitalisation, maintenance and repair works by employees of foreign companies on the premises of PKP Polskie Linie Kolejowe S.A. and Guidelines for providing information and informing the employee of another employer about threats concerning safety and health while performing work on the premises of PKP Polskie Linie Kolejowe S.A." Ibh-105.

## Installation of track occupancy control systems

In 2016, in order to reduce the risk of rolling stock collision on station tracks the company initiated the activity consisting in the installation of track occupancy control systems at the railway stations which haven't yet been equipped with such devices.

As part of the preparation of the project, a list of stations without track occupancy control systems was created, which includes the names of the stations and the number of tracks required for the development of such systems, together with the estimated costs of their installation.

In 2016, in the area managed by PKP Polskie Linie Kolejowe S.A. such systems were developed on 133 tracks of 35 stations on 24 railway lines, including 108 tracks of 24 stations from the investment resources and on 19 railway lines and on 25 tracks of 12 stations on 9 railway lines with the use of own funds.

During the implementation, the works concerning the installation of the systems on 9 tracks of 3 stations on 2 railway lines will be initiated in 2016.

Moreover, during the implementation, the works concerning the installation of the systems on 9 tracks of 3 stations on 2 railway lines will be initiated in 2016.

## Purchase of W 24 indicators made with the use of LED technology

The new investment activity undertaken in 2016 in the framework of the improvement of the SMS System was the equipment of semaphores at the selected operating control points with the W 24 indicators "Reverse direction indicator" using non-incandescent light sources (LED). Thanks to the use of LED technology it is possible to significantly increase the visibility and readability of these indicators, both due to the better visibility of the light source and the ability to adjust the brightness of the indicator to the right conditions (day/night, weather conditions).

In 2016, the funds for the implementation of central project of purchase of such indicators intended for installation at locations selected based on identified needs and operation criteria (daytime train traffic, line category, type of signalling and train control systems installed at the operating control point). The amount of PLN 2.5 million estimated in the investment plan provided for the purchase, delivery and assembly of 555 indicators, which replaced

the existing indicators based on incandescent light sources (signal bulbs). Due to the large number of locations where the exchange of indicators has been considered reasonable, the project will be continued in 2017.

## Initiatives of the Company aimed at improving staff competencies and shaping safety-oriented attitudes

In 2016, PKP Polskie Linie Kolejowe S.A. is implementing a major programme aimed to promote safety-oriented attitudes among its employees, contractors and other people related to the railway system. It should be borne in mind that the formation of the required safety-oriented attitude is a challenging and long-term process. For this reason, the Company is involved in activities performed on a continuous basis by implementing the following initiatives in 2016:

1. signing the declaration on the development of safety culture in rail transport prepared by the Office of Rail Transport and participating in the competition entitled "Safety culture in the rail transport" organised by the Office of Rail Transport;
2. talks about safety and organising special interest clubs related to safety;
3. organising the third edition of the knowledge contest entitled "Safety First";
4. organising a cycle of trainings on a CCS and communications equipment simulator;
5. developing Information Bulletins concerning railway events that have occurred and distributing them to employees responsible for railway traffic safety;
6. implementation of internal security alerts;
7. providing all Company employees with information concerning safety on the railway network under management on a semi-annual and annual basis;
8. issuing a second edition of a guide "System Zarządzania Bezpieczeństwem (SMS) PKP PLK S.A. w pigułce" (Safety Management System in a nutshell);

9. on-the-job training in the Security Office of the Central Railway Station of PKP Polskie Linie Kolejowe S.A. in the area of SMS system and security culture;
10. preparation and distribution of posters related to the terrorist threats;
11. running XII edition of Social campaign Safe Crossing – "Risk Barrier!" social campaign.

In order to emphasise the commitment to shaping a high security culture and raising awareness of threats in the organisation, in 2016 PKP Polskie Linie Kolejowe S.A. signed the Declaration on the development of safety culture in rail transport prepared by the Office of Rail Transport. Thus, the Company joined nearly one hundred other entities of the Polish railway sector, which committed themselves to take action to develop the safety culture in their organisations, in particular through the implementation of the Safety Culture Rules in the Rail Transport.

It is also worth emphasising that a number of initiatives implemented by PKP Polskie Linie Kolejowe S.A. in the area of safety culture gained recognition of the group of experts, who in November 2016 awarded the Company in the first edition of the competition entitled "Safety Culture in Rail Transport" organised by the Office of Rail Transport.

## Monitoring the Safety Management System

PKP Polskie Linie Kolejowe S.A. implemented a monitoring process for their "Safety Management System", laid down in procedure SMS/MMS-PD-04 Monitoring and Continuous Development of the Safety Management System and the Maintenance Management System (MMS), in order to meet the requirements laid down in Commission Regulation (EU) No 1078/2012 of 16 November 2012 on a common safety method for monitoring to be applied by infrastructure managers after receiving a safety authorisation. Moreover, in compliance with the provisions of this Regulation, the Company implements a Monitoring Strategy establishing, among others, the principles for selecting tools and methods of SMS monitoring for problem areas as well as qualitative and quantitative ratios used in SMS monitoring. Main areas subject to the monitoring process include:

1. the safety of railway traffic operated on the railway network managed by PKP Polskie Linie Kolejowe S.A.;
2. the correct and effective application of SMS procedures at the Company;

3. the introduction of technical, operational and organisational changes considered as significant in the change management process (procedure SMS/MMS-PR-03);
4. cooperation with suppliers and contractors whose products/services have a direct or indirect impact on railway traffic safety;
5. the effectiveness of implementation:
  - the implementation of guidelines and recommendations of National Railway Accident Investigation Board (PKBWK);
  - the implementation of guidelines of railway committees included in the Final Memorandum of Understanding (FMoU);
  - the implementation of post-inspection conclusions from inspections carried out by the Office of Rail Transport or other public administration authorities;
  - the implementation of conclusions and recommendations from SMS audits, SMS controls, SMS inspections;

- the implementation of recommendations issued by risk analysis teams;
  - the implementation of conclusions from the previous monitoring process application;
  - the implementation of tasks provided for in the Safety Improvement Programme;
  - the organisation of training courses and periodic instructions.
6. the effectiveness of implemented risk management measures and actions implemented as part of constant SMS optimisation.

The basic tools and methods of SMS monitoring at the Company include:

### Risk management measures

A total of 458 change significance assessments have been conducted in 2016, with six changes deemed to be significant – within the meaning of Commission Regulation (EC) No 402/2013 of 30 April 2013.

In addition, a risk assessment for railway traffic safety submitting quarterly reports from the implementation of

1. maintaining an accidents & events database and performing statistical analyses of data collected therein;
2. running the Operating Performance Registration System (SEPE) application and a performing statistical analyses of data contained therein;
3. analysing common safety indicators (CSI) and how they change over time;
4. SMS audits;
5. SMS controls, taking into consideration all internal regulations concerning the performance of controls at the Company, including decisions of Heads of Railway Lines District Units applicable to controls;
6. SMS inspections.

the Railway Traffic Safety Improvement Programme has also been performed as an element of the Safety Management System in force at the Company, so as to determine additional risk management measures in justified cases and minimise the degree of risk (enhance safety) related to the Company's activity.

### Implementation of the Railway Traffic Safety Improvement Programme

The primary purpose of developing and implementing the Railway Traffic Safety Improvement Programme in 2015 was to prevent any unacceptable risks and limit the frequency of hazards and their consequences through the application of appropriate risk management measures. Measures stipulated in the Programme are aimed at the implementation of main safety targets for the year 2015, laid down in Resolution No 1026/2015 of the Management Board of the Company of 17 November 2015.

Apart from measures allocated to individual initiatives and targets, the Programme also includes indicators that allow to monitor the target achievement progress on an ongoing basis. These indicators have been designed in such a way, so as to enable their comparison in cumulative periods with the state as at the end of the base year. Warning and alarm values have also been determined for each indicator in reference to all periods.

Organisational units of the Company were tasked with submitting quarterly reports from the implementation of the implementation of the Programme presented quantitative (expressed in percentages) and qualitative information concerning the performance of tasks stipulated

in individual initiatives and provided the values of main safety target achievement indicators in relation to their own activity. Quarterly reports from the implementation of the Railway Traffic Safety Improvement Programme for the year 2016 were based on the verification and analysis of information provided and subject to approval by the Vice President of the Management Board, Director for Operational Affairs.

In 2016, the Company also implemented a number of additional measures to improve railway traffic safety in all areas of its activity. In 2016, PKP Polskie Linie Kolejowe S.A. monitored the implementation of undertaken measures by developing the "Schedule of Safety Improvement Measures (...)". The total number of measures included in the schedule that were undertaken in 2016 was 79, including 23 technical measures, 40 organisational and operational measures, and 16 employee-related measures.

## Railway Security Guard

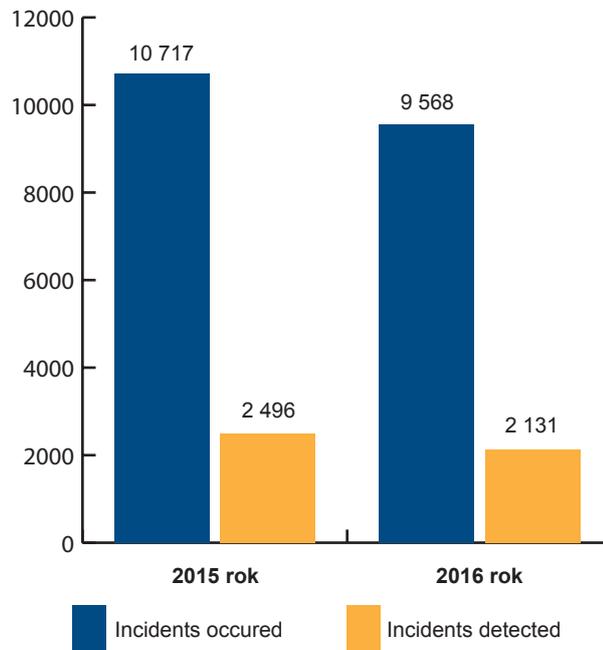
Approximately 11% less dangerous events were noted by the Railway Security Guard (SOK) in 2016 in comparison with 2015. Effective preventive measures of officers are supported by the modern equipment and well trained staff. Mobile

monitoring centres operate in the field - vehicles equipped with cameras, portable and thermal, installed on masts. Since 2015, the equipment of SOK officers has included camera traps, i.e. devices notifying officers when an unauthorised

person appear in the protected area. As part of the activities undertaken, SOK also uses specially trained dogs and company cars that work in difficult field conditions. Recently, the better efficiency of the Railway Security Guard during night activities is guaranteed by the use of night vision equipment and thermographic cameras.

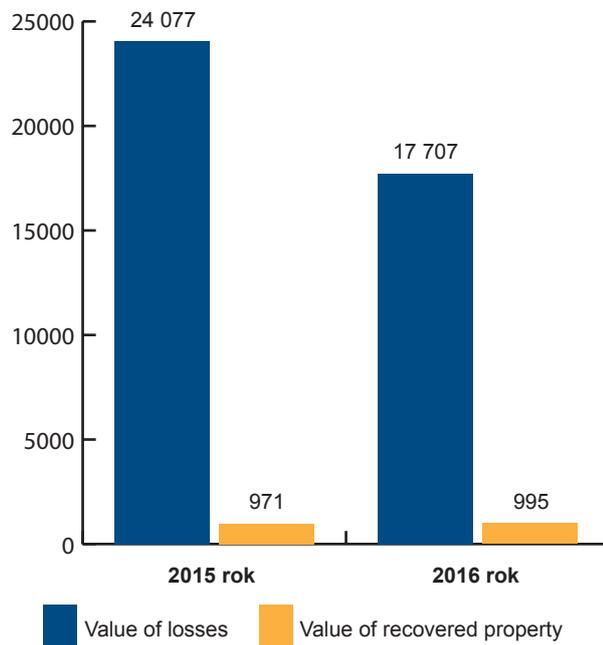
In 2016, the Railway Security Guard carried out more intensive preventive and anti-theft measures on trains, railway stations and railways. Due to the activity of officers of the Railway Security Guard, the number of offences committed in the railway area decreased by 10.72% (from 10,717 in 2015 to 9,568 in 2016, i.e. by 1,149 events).

**Events recorded by the Railway Security Guard in the years 2015 - 2016**



In 2016, the estimated value of losses resulting from offences committed in the railway area decreased by 26.5% (i.e. by PLN 6,370, 000) in comparison to 2015.

**Losses resulting from the offences committed in the railway area in thousand zlotys**



Thanks to consistent and effective operations of the Railway Security Guard, 44.7% of thefts and devastations of equipment on active railway lines have been reported. Compared to 2015, the number of incidents recorded in this category has dropped by 1067 cases (from 2,387 in 2015 to 1,320 in 2016).

The number of stolen items of the rolling stock surface, materials, tools, work items and unattended parcels was decreased by 11%. Compared to 2015, the number of incidents recorded in this category dropped by 136 cases (from 1,285 cases in 2015 to 1,149 cases in 2016).

The effective protection of the officers of the Railway Security Guard has contributed to the improvement in the safety of goods transported by rail. In comparison to 2015, the number of events recorded in this category has decreased by 178 cases (from 1,100 in 2015 to 922

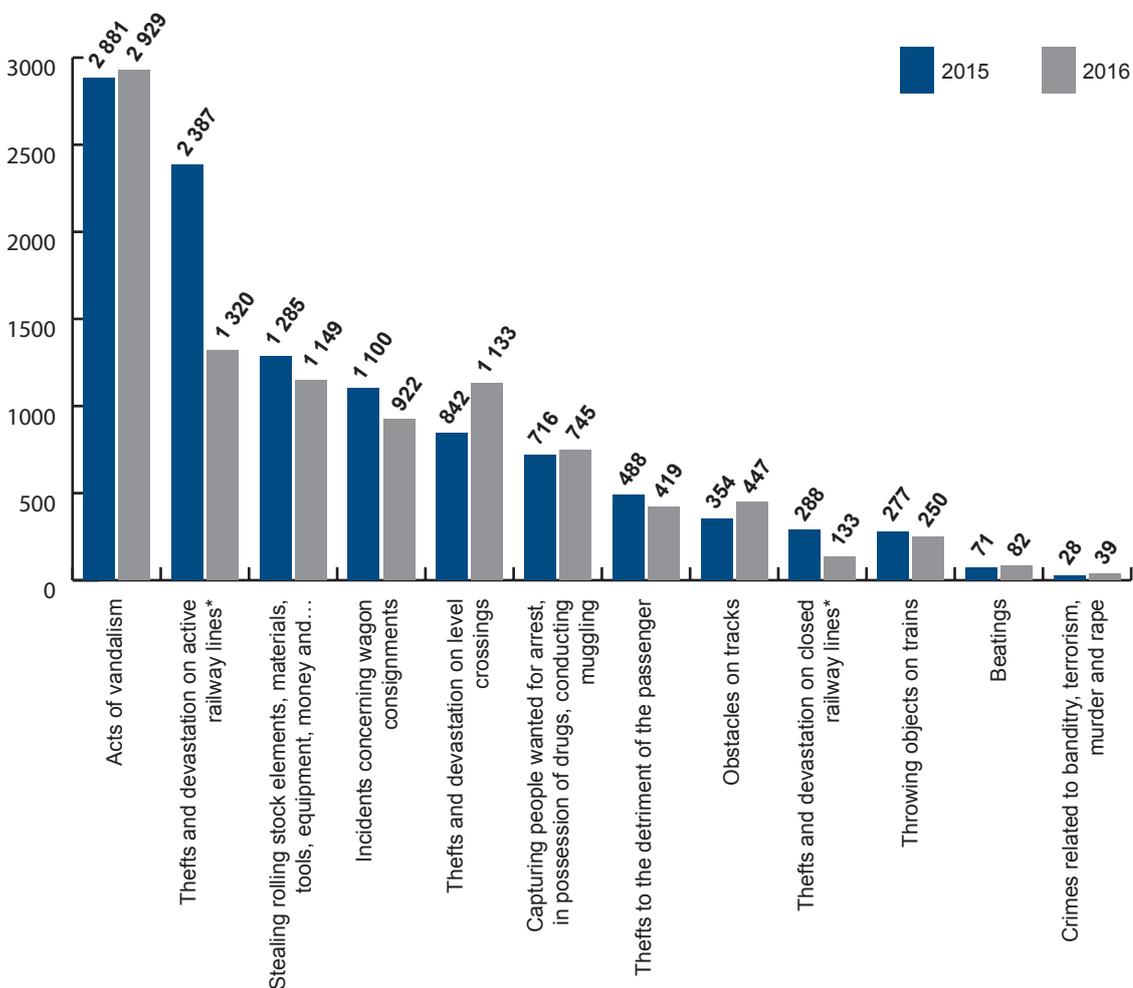
cases in 2016), representing a 19% decrease in theft of goods.

The travelers could also feel more comfortable as the number of pocket thefts was reduced by nearly 15%. Compared to 2015, the number of incidents recorded in this category dropped by 69 cases (from 488 in 2015 to 419 in 2016).

In addition, a 10% decrease in the number of the cases of throwing stones and other objects at trains (from 277 cases in 2015 to 250 cases in 2016). There was also less thefts and devastation of equipment on the closed railway lines.

Compared to 2015, the number of events recorded in this category decreased by 155 cases (from 288 in 2015 to 133 in 2016), which represents a 53.82% decline.

**Incidents in the railway area in 2015 and 2016 according to the division into incident categories**



In 2016, special commitment of the Railway Security Guard required primarily securing the World Youth Day. 2,135 officers of the Railway Security Guard were taking care of the safety of pilgrims who recorded 112 cases of breaching the law and conducted a total of 5,765 interventions and received 114 notifications of the unattended luggage.

In 2016 the Railway Security Guard officers carried out 128,098 patrols of routes, 146,359 patrols of passengers stations and 52,333 patrols of freight stations, 74,900 patrols in passenger trains and monitored the railway area at 7,400 points and 10,500 rail crossings, checked IDs of 73,925 people, cautioned 91,266 people, fined 35,243 people and caught 2,691 offenders who committed

offences in the railway area. Officers of the Railway Security Guard also conducted educational activities for children and young people in 2016. During 850 lectures, several thousand children and young people learned how to travel safely using the railway.

In 2016 officers of the Railway Security Guard carried out 14,841 inspections at scrap yards. In 37 cases, they ended up disclosing the stolen railway property. As a result of the actions taken, 11 purchasers and 46 sellers of illegally acquired rail infrastructure elements were identified.

## Railway technical emergency response service and fire protection

Safety is the absolute priority in railway traffic management. All measures aimed to ensure a high technical standard of the railway network managed by PKP Polskie Linie Kolejowe S.A. take into account the effective and efficient railway emergency response system and fire prevention solutions. In 2016, PKP Polskie Linie Kolejowe S.A. has a total of 20 technical emergency response units, including 10 Special Technical Emergency Response Trains available 24/7 as well as 10 Technical Emergency Response Trains deployed whenever necessary. These trains are equipped with:

1. EDK 750, EDK 1000 and EDK 2000 train cranes;
2. WZT-2 and WZT-1 multi-purpose crawler tractors on platforms;
3. road-rail vehicles;
4. self-propelled technical emergency response vehicles WM-15A/PRT;
5. hydraulic devices capable of re-railing heavy railway vehicles.

The operational capacity of railway technical emergency response units has been increased through the purchase, aiming at better equipment, of 26 knapsack gas cutting devices, 26 electro-hydraulic shears and 24 tents in case of long-term interventions.

Moreover, in 2016 in the Special Technical Emergency Response Train in Bydgoszcz, bought in 2015, WM-15A/PRT self-propelled technical emergency response

vehicle was implemented into operation. The specialist equipment combined with highly competent technical staff guarantees an efficient restoration of proper traffic flow on railway lines and ensures safety by providing protection against the consequences of malfunctions, technological and environmental disasters.

Railway technical emergency response units are the only rescue units in the country with adequate human and technical capabilities to deal with incidents occurring on railway lines.

In 2016, railway technical emergency response units participated in the removal of the effects of 141 incidents that occurred on railway lines managed by PKP Polskie Linie Kolejowe S.A.

Apart from its primary activity, while maintaining full readiness to undertake emergency response measures, railway technical emergency response teams provided services consisting in re-railing and hauling all types of rail vehicles on 119 occasions in 2016. In addition, they participated in a number of operational exercises on railway premises that involved the participation of rescue and fire-fighting units of the National Fire Service and other emergency response entities.

## Preparing the railways for crisis situations

According to the accepted assumptions in the framework of crisis response, which may occur in railway areas of PKP Polskie Linie Kolejowe S.A. They introduced regulations concerning the organisation of the crisis management system and the monitoring of operational work.

Within the framework of the adopted regulations, the following provisions were introduced:

1. principles of organisation of the crisis management system during the occurrence of threats and crisis situations on railway lines managed by the Compa-

ny and in buildings and constructions intended for persons and things;

2. principles of monitoring current operating and transport work and management during threats, crisis situations, other events on the network managed by the Company and in buildings and structures intended for handling persons and things.

These regulations oblige PKP Polskie Linie S.A. to develop action procedures in the event of natural disasters, terrorist or sabotage acts, including task modules for individual emergency levels, strikes and protests combined with rail and railway facilities blockages, technical failures, referred to as "emergency response procedures". Within the current solutions there are 27 dis-

aster response procedures, with the division into weather, social, technical and terrorist hazards, and 8 emergency response procedures concerning emergency level for terrorist hazard.

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## Safe Crossing – “Risk Barrier!”

In 2016, PKP Polskie Linie Kolejowe S.A. run a social-educational campaign “Safe crossing...” for over a decade. Its primary goal is to increase the awareness of the Poles in terms of safety within railway areas and thereby decrease the number of casualties of tragic accidents, e.g. on an intersection of railway with a road. This is a very important part of the Company's business, because regardless of the numerous investments - e.g. improvement of security systems and the modernization of the railway infrastructure - what ultimately determines the safety of the railways is the respect for the rules and common sense of the traffic participants.

“Safe crossing...” is one of the biggest campaigns of this kind in Europe. Its activities are appreciated both in the country and abroad. Campaign activities - through various channels of communication - are targeted at both children and young people as well as adults. Employees of PKP Polskie Linie Kolejowe S.A. and officers of the Railway Safety Guard (SOK) conduct lectures in schools and at universities, organise preventive actions and simulations of incidents. The campaign is also present in the media community - on Facebook and YouTube. The most important activities undertaken within the framework of the “Safe crossing” campaign include “Safe Friday” and “October - the month of education”.

The “Safe Friday” campaign is being run on rail and road crossings of all categories and along the tracks where there are so-called, “wild passages”. The Company's analyses show that the most common offences committed by drivers are the lack of reaction to the STOP sign, an attempt to drive under the closing barriers or to bypass them (so-called slalom ride). Controls at the crossings of tracks and public roads shall be carried out by workers of PKP Polskie Linie Kolejowe S.A. in cooperation with Police officers (Road Traffic Department) and Railway Security Guard. Employees of the Company instruct users of rail-road crossings how to behave properly when crossing. Those who violate the rules of the Highway Code, apart from the warning, receive a fine.

In 2016, 387 informational and preventive actions were carried out as part of “Safe Friday”, over 31,000 leaflets were distributed, nearly 2,000 cautions, 123 people were fined and more than 700 controls of sobriety were performed.

In October each year, employees of the Company, including officers of the Railway Security Guard, try to reach the biggest possible number of children with the “Safe crossing...” campaign by means of numerous educational lectures at schools and kindergartens. The project “October: the Month of Education” concerns the appropriate behaviour within railway areas. During educational meetings, children learn the basic rules related to crossing road and rail crossings, learn signs, acquire knowledge considering what they must not do in the area of railways. Meetings are enriched with educational films, games, plays and competitions in order to match the materials to the age group in the best possible way. During the course students receive educational books, colouring books, items reflecting light and other mini gadgets. Almost 700 educational lectures, attended by 35 thousand children. Cyclic activities within the framework of the campaign include also simulations of collisions at rail and road crossings, i.e. accidents of locomotives involving motorcycles, cars, and even buses. All those things aim at making the participants aware of what happens in the event of an accident, what force comes across the vehicle that is on the railway track. The simulations are accompanied by demonstrations of rescue services, (fire brigade, ambulance, police), which, thanks to such projects, have the possibility to perform their own procedures and thus prepare for a real event.

In 2016 the message of “Safe crossing...” campaign reached even more people. The company started - in cooperation with the Regional Driver Training Centers (OSK) - the organisation of specialised seminars for driving instructors. During these meetings, instructors receive knowledge and educational materials from the Company's employees (brochures, presentations) that they can use during their classes with the students. An important aspect of the organisation of seminars is the possibility of exchanging experience with its participants. In 2016 five meetings were held: in Poznań, Bydgoszcz, Łódź, Kielce and Lublin, and over 500 Regional Driver Training Centers were equipped with dedicated educational materials.

In 2016, PKP Polskie Linie Kolejowe S.A. invited YouTubers to collaborate in the implementation of movies within the street survey related to the "Safe crossing..." Those materials had more than a million views on Youtube.

It is worth pointing out that the campaign is also present during various events organised by other institutions or organisations. Even though at Moto Safety Day in cooperation with Office of Rail Transport and Railway Security Guard, the Company has prepared a "Safe Town", where one could check his/her knowledge concerning safety, watch the mobile monitoring center, used during work of Railway Security Guard on a daily basis and equipment used by the officers, and the youngest persons could enjoy many games and colouring books, quizzes and mini competitions. Similar attractions were waiting for participants of various kinds of picnics and outdoor events, such as Children's Day Picnic in the Chancellery of the President of the Council of Ministers.

#### **Summary of the activities implemented within the 2016 campaign:**

1. 1,190 educational lectures regarding railway safety (including the project "October: the Month of Education");
2. 456 leaflet and preventive actions on level and pedestrian crossings (including the project "Safe Friday");
3. 69 open-air events;
4. 8 simulations of a locomotive colliding with a motor vehicle at level crossings;
5. 7 press briefing;
6. 2 consolidated preventive actions on "wild crossings"
7. 5 seminars for driving instructors and lecturer of the Regional Driver Training Centers;
8. 1 inaugural conference opening the XII edition of the "Safe Crossing" campaign;
9. 2 radio programs;
10. 2 editions of cooperation with youtubers
11. more than 697,000 views of the video "one crossing too far" and over 369,000 views of the backstage video, created in collaboration with Cyber-Marian;
12. over 171,000 views of the "risk barrier" movie created in cooperation with Trucking Girl;
13. the campaign spot was shown 312,480 times in 206 Luxmed facilities.

#### **and as part of cyclical campaign projects:**

1. "Safe Friday":
  - 387 informational and preventive actions;
  - over 31,000 leaflets distributed to drivers and pedestrians;
  - 1,826 cautions;
  - 774 sobriety controls;
  - 123 mandatory fines given;
  - 10 "Fridays" during the holiday season.
2. "October: the Month of Education":
  - 692 educational lectures;
  - 35,102 educated children;
  - 31,140 minutes of education, i.e. more than 3 weeks of continuous learning.

# Development prospects

## General strategic framework

In 2016, PKP Polskie Linie Kolejowe S.A. in accordance with the statutory obligations, fulfills the function of the managing body of the national railway network, operating within the framework and strategy documents for transport and on the basis of EU regulations. The strategic framework of measures undertaken by the Company is laid down in government strategic documents on transport and relevant EU regulations.

A key document laying down the Company's strategy at a national level is the "Transport Development Strategy until 2020 (with perspective up to 2030)" – TDS1 – and the "Implementing Document to the TDS" as well as national, supra-regional and regional Operational Programmes enabling the utilisation of European structural and investment funds for the implementation of investments in railway transport.

The point of reference for the Company in terms of planned railway investments is the "National Railway Programme until 2023" (KPK) adopted in 2016. It includes investment projects implemented using funds administered by the Minister competent for transport and investments co-financed from EU funds under the Operational Programme Infrastructure and Environment (OPI&E) 2014-2020, Operational Programme Eastern Poland (OP EP) and the Regional Operational Programme (ROP). The strategic objectives of PKP Polskie Linie Kolejowe S.A. focus on meeting the following targets indicated

in the Transport Development Strategy, referring to railway transport:

1. undertaking measures aimed to create a modern and coherent network of railway lines;
2. improving the safety of traffic and transported cargo;
3. improving organisation and management methods;
4. limiting the negative environmental impact of transport;
5. developing a rational model for financing infrastructure investments.

The primary target for the Company is to ensure railway traffic safety and its continuous improvement in operational, maintenance and investment processes. All tasks for which the Company is responsible are implemented in a way consistent with the principle of sustainable growth and in compliance with the requirements concerning environmental protection, effective resource management, adaptation to climate change, biological diversity and resistance to natural disasters.

## Strategic documents

In 2016, the Company was involved in the following priority measures:

1. work on the programme entitled "Assistance in financing infrastructure management costs, including maintenance and renovations until 2023" and the draft multi-annual contract implementing the provisions of the programme – so as to meet the requirements laid down in Directive 2012/34/EU of 21 November 2012 establishing a single European railway area. The adoption of these documents will provide financing to maintain railway infrastructure in accordance with the required standards, eliminate maintenance
2. arrears and balance expenses and revenues of PKP Polskie Linie Kolejowe S.A.;
2. adoption of a document laying down the method for the implementation of interoperability requirements on railway lines managed by the Company, entitled "Strategy for the Implementation of Interoperability on the railway network managed by PKP PLK S.A.";
3. adoption of the method of implementation of the Asset Management Policy by the Management Board of the Company. The document establishes national implementation of the Enterprise Asset Management system with a piloting of implementation in a given Railway Lines District Unit.

<sup>1</sup> document adopted by means of the Resolution of the Council of Ministers of 24 September 2014, amended by means of the Resolution of the Council of Ministers dated 13 October 2014.

<sup>2</sup> document adopted by means of the Resolution No 162/2015 of the Council of Ministers of 15 September 2015, amended by means of the Resolution No 144/2016 of the Council of Ministers dated 23 November 2016.

PKP Polskie Linie Kolejowe S.A. is obligated to act in the public interest, i.e. to expend public funds efficiently and improve the quality of infrastructural services. All measures referred to above are aimed to meet the expectations of railway undertakings and other applicants to the greatest extent possible. In effect, the provisions of strategic documents constitute a foundation for the improvement of the quality of railway infrastructure made available by the Company and serving all railway users in Poland. It fits into a wider context of plans for transport development with a preference for environmentally friendly,

## EU legislation

In reference to tasks related to EU legislation, PKP Polskie Linie Kolejowe S.A. focused on drafting the most advantageous version possible of provisions laid down, among others, in:

1. proposals concerning implementing, delegated and regulation acts for a technological pillar of the 4th Railway Package;
2. drafts of legal acts concerning the schedule for the allocation process and the access to infrastructure of service facilities;
3. project of a guide for the application of Directive 2016/882 of 1 June 2016, introducing new procedure

## Rail Freight Corridors

In 2016, the following rail freight corridors: Rail Freight Corridor Baltic-Adriatic (RFC5) and Rail Freight Corridor North Sea-Baltic (RFC8), launched on 10 November 2015, were developing and reinforcing their position on the market. Concurrently, work on the creation of a Eu-

## Amber corridor

Pursuant to Art. 5 sec. 5 Regulations (EU) No. 913/2010, the Ministries responsible for railway transport in Poland, Slovakia and Slovenia have forwarded a letter of intent to the European Commission, proposal to create of a rail freight corridor called "amber", going through the territories of those Member States.

In 2016, PKP Polskie Linie Kolejowe S.A. actively supported the creation of the corridor, inter alia, through the elaboration of an "Analysis of the course of Amber rail freight corridor No. 11 in Poland". This corridor will enable the merger of Polish, Slovakian, Hungarian and Slovenian industrial and commercial centers into a joint bid for capacity allocation for international freight trains. Within Poland, the corridor will run from the border with Belarus through Warszawa, Kraków and Katowice to the border with Slovakia and will complement the network of existing cargo corridors (cargo corridors 5 and 8). The corridor will enable better traffic control in southern and eastern relations, including the connection with China and will

safe and energy efficient railway transport. The Company also participated in social consultations of projects of programme documents, in particular: "National Railway Programme", draft regulation of the Minister competent for transport, changing the regulation on the plan for sustainable development of public transport within the communication network between inter-regional and international passenger services in railway transport.

- for verifying the linguistic competences of drivers in the case of cross-border traffic;
4. proposal for the European Commission Implementing Regulation (ERC) on the implementation plan of the European Rail Traffic Management System (ERTMS).

Additionally, the Company's representatives took part in the work of the Group for transformation of the European Railway Infrastructure Management Platform (PRIME) into the European Infrastructure Management Network (ENIM), which, according to the revised 2012/34/ EU Directive, will be the mandatory expert group of ERC for the main rail infrastructure managers.

ropean Economic Interest Grouping (EEIG) for both freight corridors was completed. The premises of the two EEIGs are located at the Headquarters of PKP Polskie Linie Kolejowe S.A.

contribute to the improvement of railway communication with the Balkan countries and in Europe-Asia land connections.

## International and national cooperation

In 2016, PKP Polskie Linie Kolejowe S.A. is represented at the Plenary Meeting of PRIME, in the Management Board and at the General Assembly of RailNetEurope (RNE), at the General Assembly of the association of European Railway Infrastructure Managers (EIM), in the Steering Committee of International Union of Railways (UIC) and the General Assembly and Management Board of UIC Colpofer group. Until September 2016, the Company was represented in the Board of Governors of the UIC Railway Systems Forum. PKP Polskie Linie Kolejowe S.A. also

chairs the UIC Working Group "Security – Border Crossings, International Railway Corridors". Within the delegation of the Ministry responsible for transport and PKP S.A. the representatives of PKP Polskie Linie Kolejowe S.A. participated in the works and sessions of I, III, IV and V of OSJD Committee.

In 2016, within the framework of bilateral cooperation the main emphasis was placed on enhancing cooperation with the partners from neighbouring countries.

## Research and development measures

In 2016, PKP Polskie Linie Kolejowe S.A. developed cooperation with the National Research and Development Centre (NRDC) to draft innovative solutions that will increase operational efficiency of the Company. In relation to the above, works concerning the realisation of the so-called Joint Undertaking, whose value will amount to nearly PLN 50 million.

Under this plan, more than 20 innovative projects are planned to be funded. This initiative will ensure, for example, solutions to increase the train traffic management

and providing optimisation of the maintenance and modernization of railway infrastructure.

This initiative will be continued in 2017 and it is to result in the utilisation of modern technologies in rail transport and point the industry towards innovative solutions that meet the expectations of railway infrastructure managers and may be adapted to the Company's activity.

## Strategic planning

Measures in the area of programming the Company's investment activity in the financial perspective for 2014-2020, initiated in previous years, were continued in 2016. In the first half of 2016, the Company and the Ministry responsible for transport carried out works on the amendment of a key strategic document entitled KPK. This document established the financial framework and conditions for the implementation of government plans within the scope of railway investments scheduled to be implemented in the financial perspective for 2014-2020.

Public consultations on the Programme were carried out in July and September 2015. During the consultations, answers and explanations were given to approx. 1,000 queries. The KPK was amended by means of the Resolution no 144/2016 of the Council of Ministers of 23 October 2016.

The document includes 220 projects on primary lists, the total value of which amounts to PLN 66.4 billion.

For 10 of the above mentioned projects, the Company drafted applications to be submitted under the second CEF (Connecting Europe Facility) call for applications. All proposals were accepted by the EC and Grant Agreements (GAs) were concluded for all of them. In addition, 5 applications were drafted for the third CEF contest, which was announced in October 2016.

In 2016, within the framework of actions related to pro-

gramming of the investment activity in the EU financial perspective for 2014-2020, the cooperation with the Marshal's Offices was intensified in terms of the realization of the projects under ROP, which allowed for submitting applications for financing 4 projects (for the amount of approximately PLN 935.5 mln, which amounts to 20% of the planned expenses under ROP), of which the total amount of PLN 232.5 million has already been contracted for 2 projects.

The year 2016 also saw the continuation of cooperation with PKP S.A. on the joint implementation of investments consisting in the comprehensive modernization of station, track and platform infrastructure on railway stations. Within the framework of the available funds from the OP EP Program, the Company signed an agreement in October 2016 confirming formal cooperation in this area. Within the framework of OP EP, PKP Polskie Linie Kolejowe S.A. is planning to perform, among others, works on railway lines No. 25 Skarżysko-Kamienna - Sandomierz, No. 31 Czeremcha - Hajnówka section; No. 32 section Białystok - Bielsk Podlaski (Lewki), No. 216 on the section Działdowo - Olsztyn, No. 219 on the Elk - Szczytno section, and they will be supplemented by modernizations of selected by PKP S.A. railway stations located in their neighborhood.

## Support for investment undertakings

Regarding undertakings related to facilitating the investment planning process in 2016, works were continued on the development of the so-called multi-level traffic model. This tool will allow to generate reliable railway traffic forecasts within the entire country and then to make investment decisions using the recommendations created on the basis of the analyses generated by it. Moreover, it will be possible to compare the rail transport offers with other modes of transport. This will allow for a more effective defining of the scope of investment in railway infrastructure, determination of the necessary conditions for railway transport competitiveness, and will also streamline the application of EU funds.

In 2016, with the support of an external contractor, the works on the Micro-simulation Model of Masovia (M3) were continued. It is an innovative project in national terms, whose scope will cover over 2,900 km of railway lines. The main purpose of the project is to implement a specialised IT solution for inspecting the railway lines capacity. It will be used for analyzing investment projects, identifying operational problems and capacity constraints on the railway network, and developing proposals for improvements to railway infrastructure. In 2016, the methodology of network model construction was developed, i.e. precise mapping of all infrastructure elements affecting train traffic. Most of the work related to the modeling of the network has also been completed. In 2017, train traffic analyzes will be carried out after the PKP Polskie Linie Kolejowe S.A. investment works. Subsequent extensions of further sections of the network will be complementary to the model implemented in the M3 project, allowing for detailed analysis also in other regions of the country. With the initiation of expansion it will change its name to Micro-simulation and Analytical Model of Track-way System (MAMUT). Additionally, in 2016 a microsimulation model was built solely by PKP Polskie Linie Kolejowe S.A. depicting the traffic running through Warszawa Gdańska station, during detours while the planned repairs of the diametral line in Warszawa were held. It was designed to provide a timetable for trains, assuming traffic congestion during the repairs, using the available bandwidth in the most advantageous way. At the same time, the possibility of making small investments significantly improve the traffic conditions was identified, such as an additional spacing semaphore, and incorporated them into the Company's investment plans.

In order to clarify the areas of microsimulation in the Company, the "Rules of making microstimulation models at PKP Polskie Linie Kolejowe S.A." were developed. This document streamlines processes already in operation, sets new areas for the application of railway traffic microsimulation, and defines pilot procedures for their implementation.

In 2016, work was carried out on the development of the architectural and functional concept of passenger infra-

structure at the Warszawa Zachodnia Station. The aim of the project is to create an integrated hub concept with the largest number of passenger trains in the country. The project included in-depth analytical work based on pedestrian traffic measurements and research, pedestrian forecasts and microsimulation. The works include: planned new tram line, new spaces for passenger service and management of the surrounding areas. As a result of the work carried out, a passenger friendly hub was developed with inspirational architectural solutions. Thanks to the innovative approach on a national scale, the most attractive solutions were tailored to the needs of passengers.

In 2016, work on the basis of an analysis of industrial facilities for inclusion in the railway network was continued, in preparation for the reconstruction of section of the railway line No. 301 Jełowa - Murów.

In 2016, an analysis of the availability and use of the railway infrastructure of the corridor C-E65 for the needs of ports in Gdynia and Gdańsk was made. The aim of the study was to analyze the capacity and parameters of the Tricity Railway Network and the northern part of the corridor section C-E65 to transpose the forecasted railway freight and passenger traffic. Analyzes have shown that there are currently problems with providing smooth, unobstructed traffic under existing line capacity, requiring a number of directional and organizational investments. As part of the project, the directions of actions were recommended and the reasonableness of investment tasks planned for implementation within the KPK was justified. In November 2016, the project was approved by the Company's Management Board and then transferred to the institution supporting the preparation of investments intended for EU funding.

## Interoperability

In 2016, the “Strategy for the Implementation of Interoperability on the railway network managed by PKP Polskie Linie Kolejowe S.A.” was updated in terms of adopting railway lines to the requirements of the Technical Specification for Interoperability. The update included changes in projects eligible for financing from CEF sources and - obtained in the investment process - EC verification certificates for structural subsystems.

The document is designed to assist decision-making in the field of railway investments planning and execution. It influences the order and maintenance of chronology in the scope of implementation of interoperability requirements on the railway network managed by PKP Polskie Linie Kolejowe S.A.

In 2016, in the process of negotiating tender materials and giving opinions on the documentation produced within realized projects (SOW, Feasibility Studies, pre-design documents, design documents, etc.), the aim was to obtain and ensure the conformity of technical solutions with the requirements of the Technical Specification of In-

teroperability (TSI). Confirmation of such compliance is possible on the basis of:

- notified bodies certifying documents: indirect EC verification certificates and EC verification certificates for structural subsystems;
- contractors of investment projects and works, EC declarations of verification issued to the above certificates.

These measures were implemented to monitor the compliance of the materials reviewed with the requirements for interoperability. Certification and conformity assessment were taken into account in the work of the Evaluation Teams of Investment Projects (ZOPI) and Study Evaluation Groups (ZOS). The process of submitting projects to the Office of Rail Transportation (UTK) on the renewal or modernization of structural subsystems has been continued to obtain an administrative decision on the necessity to apply for a re-authorisation of the structural subsystem after the completion of the investment.

## Asset Management

In 2016, the works related to the preparation of implementation of the Asset Management in terms of railway infrastructure maintenance were continued by the Company. The Management Board of the Company adopted a strategy for the implementation of the Asset Management. Furthermore:

1. an inventory and analysis of the ongoing asset management projects in the Company for their consolidation and unification after the merger were made;
2. reference visits were organized by Italian and British Rail Infrastructure Management (RFI, Network Rail)

3. to ensure the right direction for strategic deployment; a technical dialogue with the IT solutions Enterprise Asset Management manufacturers has been launched to develop a description of the procurement object.

The Company has developed a number of business and industry requirements for rail, power, telecommunication, automation, passenger infrastructure and diagnostics to launch the tendering procedure.

## Information Technology

In 2016, the following has been developed with regard to systems supporting the operating activity of PKP Polskie Linie Kolejowe S.A.:

### Software (Development) Division

**The following tasks were developed and implemented within the framework of the maintained and developed Network Description Management (POS, e-POS) system and the Modification of Operational Parametres of Railway Lines (ZMIPEL) application:**

1. Crossing Registration Module – a number of functionalities has been developed and implemented to maintain the data required by the revised regulation of the Ministry responsible for transport in relation to

the technical conditions, which should be met by the intersections of railway lines and sidings with roads, and their location. The developed IT solution also includes a number of specialized reports (eg. crossing certificate) and statistical (eg. KD6);

2. Superstructure Registration Module – documentation was prepared and an application was developed for the registration of the elements of railway superstructure. After the tests and trainings in 2017, its production will be implemented in the Company;

3. Tournout Registration Module – documentation of the system has been developed and work on the application has started. In 2017, it is planned to implement this module along with the Superstructure Registration Module;
4. Module Rules for train route allocation – a mechanism has been developed and implemented for proposing and approving amendments to Annexes 2.8 (List of distances to freight terminals, refuelling facilities, storage sidings and maintenance points for railway vehicles) and 2.9 (List of open to the public loading tracks with adjacent loading yard or ramp managed by PKP Polskie Linie Kolejowe S.A.);
5. ZMIPEL application – developed and implemented mechanisms to record the applications for changes in technical and operational parameters in terms of alternative timetables with a function of automatically generated applications for a change to the future timetable. Thanks to this change, the procedure of changes to the POS database using the traditional form of applications (paper documentation) was significantly reduced.

**As part of the ongoing system of “Poznański System Ewidencji Ograniczeń i ich Rozliczania” (POSEOR; Poznan Records of Limitations and Their Settlement System), the following tasks were developed and implemented:**

1. new function of choosing sorting key in registration reports, data filtration system expanded by the ability to filter by industry responsible for implementing limitations, automation of the process of substitution of certain values of limitation parameters for established group of reasons, development of advanced data verification functions and mechanisms securing against the introduction of incorrect values;
2. modernization of the database comparison function to facilitate comparative analyses with limitations implemented to the timetables imported from POS.

**Under the maintained and developed Timetable Design System (SKRJ), the following tasks were developed and implemented:**

1. a new train route valuation module has been developed based on analysis of changes of all subsequent versions of a given order;
2. a train valuation module has been developed under the Individual Timetables (IRJ) based on model routes;
3. an “Order” class has been developed to optimise the traction and collision control procedures, which provides the opportunity to commence work on railway station capacity under the timetable construction process;
4. the Internet Train Path Ordering System (ISZTP) Module v3 – a new module enabling to return the Individual Timetable (IRJ) to the operator for a correction if it is impossible to execute the order with the given

parameters. This solution makes it possible to significantly shorten the lead time in case of corrections and amendments submitted by carriers;

5. ISZTP v3 – a new catalogue route module, in which the catalogue route search service and the interface for end-users were optimised, has been implemented;
6. ISZTP v3 – plug based on HTML5 technology and jQuery and Bootstrap framework was developed, which interactively presents in the browser a network of railway lines managed by PKP Polskie Linie Kolejowe S.A. The plug enables to set up a point’n’click train route, which allows to speed up the process of submitting an application for train travel by the users of the module. The plug can also be used in any web application (currently ISZTP v3 and SEPE II are using it);
7. an interface between SKRJ and EPM systems for planning and coordination of track closures was developed and programmed;
8. an interface between SKRJ and RailSys systems (Micro-simulation Model of Masovia [M3]) was developed and programmed;
9. a website in REST technology (PLK TimeTable REST service) has been developed and programmed for displaying passenger train schedules for third parties.

**Within SEPE system, the following tasks were developed and implemented:**

1. SEPE system was used to track and search trains for the duration of World Youth Day (WYD) and for the military operation ANAKONDA (new search filters and reports have been developed);
2. SEPE was migrated to a higher database server. This resulted in an increased productivity and speed of operation of the database. Database procedures have also been optimised;
3. a new report on train routes analysis was prepared for the needs of the Office of Rail Transportation (UTK) survey;
4. changes were introduced to the module Settlements for granting access to railway infrastructure in accordance with the rules applicable to the 2015/16 Timetable.

**The following solutions were developed and implemented as part of the “PLK Web Portal for Passengers” (PDP) system:**

1. a “Buy a ticket for ŁKA trains” button has been added to the PDP to redirect users to the ticket purchase form for Łódzka Kolej Aglomeracyjna and a “Buy a ticket for PR trains” button for Przewozy Regionalne;
2. implementation of a Passenger Portal search engine on the Koleje Śląskie website;

3. publication of the Passenger's Portal and mobile application "Railway Timetable" in an English version in connection with WYD;
4. introduction of new functionalities in the Passenger's Portal, i.e.: "Catalogue of connections", "Catalogue of stations with list of facilities for the disabled" and the dedicated page of "List of obstacles";
5. publication in the Passenger's Portal and in the mobile application "Railway Timetable" presentation of a planned circular train route on the map and in the details of the connection.

**As part of the maintained and developed systems: the "Train Dispatcher Support System" (SWDR) and the "Crossing Keeper Support System" (CKSS), the following tasks were completed:**

1. further development of both applications by adding new functionalities in accordance with users and business administrators requests;
2. optimisation and increase in the speed of operation and reliability and further improvement of the availability of both systems.

**The following tasks were implemented as part of the maintained and developed "Interactive CCM Map":**

1. a dedicated version of the application for the Railway Security Guard (SOK) was created. This version is tailored to the needs of the individual and was developed in close cooperation with SOK, in response to the reported demand of, among others, monitoring the location of SOK officers patrols working in the field. The application was implemented in July 2016 in 16 Regional Headquarters, enabling coordination of SOK activities in the field during WYD;
2. due to WYD being organised in Poland, a dedicated version of the application for the group of passenger operators was also produced. The application was launched in the dispatch offices of these companies and enables cooperation and coordination of activities of passenger operators with PKP Polskie Linie Kolejowe S.A.

**The following tasks were developed and implemented as part of the "Railway Line Information System" (SILK):**

1. the system migrated from aging physical servers to the virtual server environment, improving the speed and availability of data for users and improving system reliability and security.
2. activities were conducted to develop a way of making current level crossings data available for rescue services under the emergency number 112. A server environment has been developed to allow spatial data to be shared with external entities;
3. development works of SILK system were commenced. By the end of 2016 the following task have been implemented:

- pilot development of additional track vector for selected points of operation;
- providing functionality for LRS Module administrators in the field of additional tracks operation;
- develop and implement functionality for optimising the management of documents deposited in a data repository in the Documentation Module.

**The following tasks were developed and implemented as part of the "Railway Line Codification" (KLIK) system:**

1. development and implementation of a concept of copying and verifying large number of measurement data, transferred from the measuring vehicle to the IT resources in the server room;
2. providing technical support for organisational units of the Company aimed at launching specialised analytical applications of the KLIK system.

**The following systems were developed and implemented: the "Railway Traffic Safety Improvement Programme version 1.0" (PPBRK 1.0)**

PPBRK is a system for monitoring the process of refining the Security Management System (SMS) and implementing priority security objectives. This is an application that uses the Microsoft SharePoint 2013 as graphical interface. The application implements functionalities related to:

1. agreeing on a framework of PPBRK for the Company for the following year;
2. developing and approving detailed PPBRK Programmes for particular organisational units of the Company for the following year;
3. reporting on the implementation of specific PPBRK by particular organisational units of the Company in the current year.

**The Hazardous Materials and High Risk Goods Information System was developed and implemented.**

The system was developed on the request of the Railway Traffic Management Centre responsible for supervision and special transports. This is a web tool that enables employees to become familiar with the procedures for accidents involving trains carrying hazardous materials.

**The following tasks were implemented as part of the "Electronic Traffic Log" (EDR) system:**

1. implementation of all EDR layers: database, service, and user interface layers as well as the installation application and testing the operation of the system in laboratory conditions;
2. implementation of data replication mechanism for SEPE data, providing current data on trains on EDR system networks;

3. as preparation for piloting at selected operating control points, trainings of pilot users were carried out at the Railway Lines District Units in which these control points are located;
4. by the end of 2016, the implementation and testing of the system started in 13 selected pilot control points. As part of the piloting, real-time completeness, reliability and capacity of the system, and the resistance to low quality of network connections and the accuracy of cooperation with SEPE are tested in real conditions.

**The following tasks were implemented as part of the “Dynamic Passenger Information Central System” (CSDIP):**

1. in July 2016 a pilot implementation of the CSDIP system in Zielona Góra took place in the field of announcements and the operator control-desk. The extent of implementation was realised in accordance with the object's readiness to include it in the CSDIP piloting;
2. analytical and design work on the CSDIP HA/DR architecture, taking into consideration new technological solutions in the field of architecture of information systems.

**The following tasks were implemented as part of the “Operating Performance Registration System version II” (SEPE II):**

1. the Train Planning module has been implemented for commissioning. This module serves operators and employees of the Company to plan the launching of freight trains on a given day;
2. implementation of Train Run Duration Entry Modules. The module is used for current train operation;
3. book of events module has been implemented. This module is used to register accidents and incidents on the railway network managed by PKP Polskie Linie Kolejowe S.A.;

## Infrastructure Division

1. In the area of Company's data protection, the software protecting against downloading dangerous content from the Internet was renewed and the firewalls were upgraded to newer versions;
2. As regards data processing centres, in response to growing business demands, data storage space and servers' processing power were expanded. A dedicated NAS storage solution was also deployed to store large amounts of unstructured data, as well as power supply at the Company's Data Processing Center in Sosnowiec was expanded, and additional protection against flooding was provided at the Company's Data Processing Center in Warszawa;
3. In the area of teleinformatic networks, the modernization of the structural cabling was started in the

4. the first version of the Graphic Train Timetables has been implemented. The graphic timetable is one of the basic tools allowing the employees of the Railway Traffic Management Center to get an idea of the traffic situation.

### International cooperation

Employees of PKP Polskie Linie Kolejowe S.A. actively participated in meetings aimed to develop assumptions and build systems to facility the exchange of data between EU Member States, including meetings organised at the European Union Agency for Railways (ERA) concerning the RINF (Register of Infrastructure), as part of which remarks were submitted with regard to the specifications of individual registry parameters. In addition, RINF data is transferred on an ongoing basis to the RINF database in EUAR. Within TAF TSI, the quality of data has been improved through interface updates and updates in the CRD (Common Reference Files) database of locations and geographical data. In addition, the Company employees were also actively participating in the project to standardise the exchange, arrangement and improvement of the quality of data in the databases operated by RailNet Europe (RNE) as part of the TAF/TAP TSI projects.

4. Company's Headquarters, and the key core devices were modernized and expanded at the Company's Data Processing Centers in Sosnowiec and Warszawa;
4. As regards IT solutions used in group work, a modernization of the video conference system along with the integration with the communicator and electronic mail was carried out, thus creating a unified communication system;
5. In the area of IT tools for improving work, a system of secure remote access to the Company's resources has been developed for employees joining from outside the corporate network.

## Systems maintenance and development division

### Functional expansion of the Human Capital Management system – SAP Human Capital Management (SAP HCM)

#### Objective of the project:

1. providing business continuity by exchanging existing, non compliant with business requirements solutions for remuneration services and employee benefits, and implementing one integrated ERP IT solution;
2. data entry automation in quantitative terms (information of the same type for multiple objects is entered only once) and in qualitative terms (introduction of a given data forces the introduction of another data);
3. providing access to current and correct data through a set of reports and by exhibiting selected information in the employee and management self-service.

#### The scope of the project covers:

1. personnel management along with electronic document archiving;
2. proxy management;
3. organisational structure management;
4. work time management;
5. payroll settlement;
6. competence and training management and training events management
7. analyses and reporting;
8. employee and management self-service SAP portal solution;
9. company social benefits fund (ZFŚS) management.

#### Benefits:

1. facilitating and enabling strategic and long-term decision-making based on coherent and reliable data on human resources, and above all on their current state in each aspect (quantitatively and qualitatively);
2. obtaining conditions for the implementation of new human resources management tools through a scalable, flexible and integrated system that can be modified and supplemented with new functionalities;
3. transferring full responsibility for the planning, development and management of subordinate line management teams thanks to the management self-service functions and the construction of systems based on direct interaction with subordinate employees (workflow mechanisms);
4. ensuring business continuity, including timely and accurate remuneration, through the implementation of a stable and integrated HR and payroll system;
5. ensuring full compliance with external and internal regulations through:
  - introduction of standardisation and automation processes;
  - parameterisation, i.e.: limitation of freedom in the operation options,
6. increasing the efficiency of personnel and payroll services.

### Implementing Electronic Invoice Flow Stage 2 (EOF2)

Implementing payment processing workflow, receipts of fixed assets (OT documents) and posting orders

#### Benefits:

1. reducing the processing time of the documents included in this implementation;
2. improving process safety - all documents processed in the system have precise description and approval steps;
3. reducing costs of processing by eliminating paper document flow.

### Implementing a tool for generating a Unified Control File (JPK)

IT solution was implemented in accordance with the requirements of the Act of September 10, 2015 on the amendment of the Tax Ordinance (Dz. U. [Journal of Laws] from 2015 Item 1649). A new control method is an obligation of taxpayers to transfer tax books data at the request of the tax authority in a unified electronic form. Launched on July 1, 2016, it applies to companies with more than 250 employees that have an annual turnover of more than EUR 50 million, or the total asset balance at the end of one of these years exceeded the PLN equivalent of EUR 43 million. The implemented IT solution includes: account book structures, bank statements, storages, purchase and sale records, VAT invoices.

#### The project team has prepared:

- IT solution for generation and transmission of the required structures in accordance with the scope of the project to the relevant Tax Office;
- mechanisms for archiving data to a specified resource along with a disk resource.

#### Benefits:

- the requirements imposed on the Company by the Ministry competent for finance were met;
- the possibility of transferring data to the Tax Office in electronic form was made available, thus eliminating the traditional form of exchange of the requested data;
- work during audit was facilitated by implementing one consolidated solution.

### Implementing SAP Business Planning and Consolidation (SAP BPC) - Consolidation

1. In 2016, the deployment of the system for consolidating financial statements on the basis of SAP BPC was finished;
2. the deployment of this solution resulted in the following benefits for the Company:
  - reduced time required to prepare consolidated financial statements;
  - streamlined process of obtaining financial data from PKP Polskie Linie Kolejowe S.A. subsidiaries;
  - automated consolidation process;
  - improved quality of obtained data necessary for the consolidation process.

### Preparation of the Implementation project of the system supporting the debt recovery process (WiNa)

The aim of the system is to automate and streamline the process of debt recovery in the Company by supporting particular stages and staff responsible for conducting the recovery proceedings.

### Preparation of the implementation of the project of the Sales Document Flow System and the Central Register of Sales Contracts (SPOD)

#### The project includes:

1. setting up a central Approval Portal;
2. extending the existing process of issuing and circulating sales documents issued in the SAP ERP SD system together with the electronic invoice;
3. setting up a Central Register of Revenue Contract in SAP ERP;
4. creation of Central Archive of documents.

### Preparation of the project titled Implementation of the Planning System

The Company carries out the planning process on an annual basis, divided into economic units, Headquarters units, monthly periods, sub-budgets including among others sales budget (revenue from rendering access to railway lines to railway operators), public funds, maintenance and repair budget (industrial costs), non-industrial budgets, including remuneration costs. Planning is carried out in particular economic sections and units of the Headquarters by planners and traders, and the Headquarters is responsible for its coordination.

## Information Security Department

1. Safety and vulnerability detection tests were carried out with the use of appropriate tools;
2. Comprehensive protection against threats was implemented, including:

### The aim of the Project is:

1. implementation of a new planning system for creating financial plan and monitoring its implementation;
2. planning system integration with SAP Business Objects reporting system.

### Preparation of the Implementation project of the new system supporting the procurement process

Commencement of work on the implementation of the new system supporting the procurement process at PKP Polskie Linie Kolejowe S.A.:

- a technical dialogue was held;
- a project team was appointed by a Member of the Management Board ;
- first draft documents were prepared ("Project Initiative", "Project Sheet");
- works on the development of SOW were launched.

### Benefits from implementing a new system:

- compliance with the requirements of the Directive of the European Parliament and the Public Procurement Law (PZP) in the field of public procurement electrification,
- improving the functionality of the system and electrifying the procurement process through the electronic flow of procurement documents;
- improving ergonomics of the system;
- extension of functionalities of the system with modules:
  - planning;
  - electronic coordination of procurement documents (among others Description of the Subject Matter of the Contract, Terms of Reference, draft contract);
  - approvals with the use of mobile devices.

### Implementation of a new version of Intranet portal

A new version of the Intranet Portal, designed for PKP Polskie Linie Kolejowe S.A. employees, was developed and implemented. It contains the most important information, useful tips and forms, and documents classified by topic.

### Implementation benefits:

1. new graphic layout;
2. a new contact book integrated with the SAP system;
3. logging on to a domain.

- anti-virus and anti-spam protection for workstations;
- antivirus and antispam protection for physical and virtual servers;

- electronic mail and website protection;
  - implementation of a data bus for mass blocking the detected threats;
  - browser protection and monitoring the content downloaded via those browsers;
  - mobile devices and laptops encryption;
  - implementation of management and monitoring functions for USB ports in computers;
  - implementation of security management on laptops, on which employees use the Internet outside of the Company;
  - implementation of a functionality monitoring the state of protections and detected vulnerabilities.
3. Implementation of a central system for managing the privileged rights on workstations in the Company;
4. Services were implemented for administrators to securely store passwords for privileged accounts;
5. IT and organizational works related to the preparation of the Company's Headquarters for the renewal of the ISO 27001 Certificate were carried out;
6. The SIEM system was migrated to a more advanced version.

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## Geoinformation

In 2016, products manufactured as part of the following project were implemented in the Company: "Digitisation of geodetic operating documentation for railway lines with the aim to improve the efficiency and safety of the transport system in Poland and the efficiency of railway infrastructure management" and implementation of standards in the field of storing and updating documentation in the central repository of data.

The year 2016 was a time of developing concepts and expansion of the Railway Line Information System (SILK) in the Company. As part of the SILK4 Project, which will also be implemented in 2017, it is planned to develop the functionality of the system in the scope of extension of the integration with the Network Description Management (POS) system in the field of visualisation and maintenance of station tracks and level crossings, as well as integration with the Railway Line Codification (KLK) system to further increase the accuracy of the geographic location of data stored in the system.

Furthermore, the Interactive Map of Railway Lines (MILK) will feature data on the investment projects being implemented (integration with the Enterprise Project Management - EPM system) and data on network and poster timetables.

In 2016, functionalities developed under the "Development of innovative methodology and IT system for railway line codification management - Stage II" project were implemented. The implemented functionalities enabled the Company to create a spatial database of railway line gauges obtained during remote measurements using laser scanning technology, geo-referenced GNSS/INS system and photogrammetric ground measurements. In 2016, as a result of operations implementing the aforementioned project, the Polish Patent Office granted PKP Polskie Linie Kolejowe S.A. a patent for invention titled "System and method of measurement and analysis of railway line gauge elements."

## Environmental protection

The experience gained during the implementation of the projects in the financial perspective 2007-2013 has allowed to determine the impact of environmental issues on the preparation and implementation of investments in two fundamental aspects: time and costs.

The time needed to obtain a decision on the environmental conditions and the costs incurred in order to carry out a thorough environmental impact assessment significantly affect the quality of environmental documentation.

The quality of environmental documentation depends on the range and size of the used environmental equipment. In the absence of some data sources, such as information on the actual impact of railways on the environment, measures to minimise impacts are proposed (eg. implementation of rainwater drainage devices, animal crossings, acoustic screens) which are not necessary always and everywhere. That is why PKP Polskie Linie Kolejowe S.A. commissioned to carry out tests and expert opinions that allow to establish the actual impact of railway lines on particular components of the natural environment.

Prior to the implementation of the investments it is necessary to carry out an analysis of the natural environment along the railway line and to assess the impact of the planned investment on the environment. For this purpose, environmental documentation is provided for the purposes of obtaining decisions on environmental conditions for railway investment projects. Considering the number of investment projects planned by PKP Polskie Linie Kolejowe S.A., in order to accelerate the process of obtaining administrative decisions, a framework agreement was signed in 2015 for the task "Development of documentation for the purpose of obtaining decisions on environmental conditions for railway investment projects implemented by PKP Polskie Linie Kolejowe S.A. within the perspective 2014 - 2020, stage III." This contract was signed with seven contractors. In 2016, a total of 32 implementing agreements were signed, covering conducting natural inventory, completing project information sheet and environmental impact assessment reports. More than PLN 11 million was allocated to the implementation of framework agreement. The current framework agreement has been concluded for a period of 4 years or until the exhaustion of the allocated funds.

In 2016, the project titled "Wildlife inventory and surveys on selected sections of railway lines planned for implementation in the years 2014-2020 - stage II", aimed at gathering data on the resources, values and condition of the natural environment in the terrains in close vicinity to the selected railway lines on which railway infrastructure projects are to be implemented, was finished. 7 agreements with a total value of nearly PLN 2.3 mln were signed under the project. The environmental research covered approximately 1,300 km of railway lines. The data acquired under this contract is a necessary element for the development of project information sheets and reports on the impact of the investment on the environment, prepared for the purposes of conducting an

environmental impact assessment, planning appropriate measures to minimise the impact of railway transport on the environment and obtaining decisions on environmental conditions.

In 2016, PKP Polskie Linie Kolejowe S.A. carried out an "Expert opinion concerning the impact of railway lines on bats". Under the task it has been shown that bats use the railway lines as migration routes, but they migrate both along the traction and the green and the ecotone created through the construction of the line. It has been found that at least 13 species of bats use the railway facilities, including bridges, culverts and buildings. Most often they function as day shelters for individuals or small groups of individuals. The traction network, or parallel to the railway line electrical grid, does not negatively affect the occurrence or the migration routes of bats. In addition, data collected during the study confirmed that bats mortality on railway lines was very low.

Due to the lack of appropriate guidelines to help determine the runoff coefficient, PKP Polskie Linie Kolejowe S.A. commissioned an "Expert opinion concerning guidelines for designing rainwater and snowmelt drainage", which was developed in 2016. The runoff coefficient is crucial for correct estimation of the maximum amount of water entering water facilities. So far the calculations were made on the basis of the implemented Polish Standard PN S 02204/1997 "Road drainage", which could give rise to problems resulting from completely different technical conditions of asphalt roads and railway lines. Within the expertise:

1. coefficients of flow of rain and snow water from railway lines were determined;
2. guidelines have been developed to calculate the amount of snow and rain water from railway lines, taking into account adaptation to climate changes which are the basis for the design, construction and proper use of drainage equipment for railways.

In 2016, PKP Polskie Linie Kolejowe S.A. obtained 24 decisions on environmental conditions and 1 decision amending decision on environmental conditions, as well as 57 decisions laying down conditions for the implementation of investments, at the stage of repeating the performance of the environmental impact assessment. By obtaining these decisions the Company was able to undertake further administrative steps aimed to obtain necessary building permits.

In the course of preparation of railway investments, in the case of environmental determinants, in many cases obligations are imposed on post-implementation analyses or nature monitoring after the completion of investment projects and commissioning of railway lines. In 2016, PKP Polskie Linie Kolejowe S.A. undertook preparatory work for the implementation of 16 post-implementation analyses. In the second half of 2016 tender proceedings with

totally estimated value of more than PLN 2 million were initiated for the above-mentioned analysis and monitoring.

In 2016, PKP Polskie Linie Kolejowe S.A. have to deal with the problem of railway noise both in the scope of the investment being implemented as well as during the daily operation and maintenance activities of railway lines. This involves the need for the performance of many analyses and acoustic measurements. On 7 January 2016, the Polish Center for Accreditation (PCA) granted the accreditation no. AB 1586 to Acoustic Laboratory in the scope of measurement of noise from railway lines with a sound level of A between 30 and 130 dB (direct measurement method) and testing of equivalent sound level A for T reference time expressed by LAeqD and LAeqN indicators (from calculations). Accreditation is granted for the period of 4 years. Once a year the Acoustic Laboratory is assessed under PCA supervision and, in addition, according to the quality policy, assessed by an independent auditor. In 2016 the employees of the Acoustic Laboratory performed 46 measurements of the noise level in different locations throughout the country, excluding system measurements (external audit, PCA supervision, intercalibration and interlaboratory comparison).

The Company's current noise protection obligations are, due to the specification of the railway area, fulfilled mainly by means of implementation of very expensive protection measures in the form of screens with a height of 4 to 6 meters. These solutions, on the one hand, are highly effective, but on the other hand, they are often not

adequately introduced into the scale of exceedances of the permissible limit values specified in the Regulation of the Minister responsible for environment of 14 June 2007 on permissible noise levels in the environment (Journal of Laws of 2014, item. 112). With this in mind, PKP Polskie Linie Kolejowe S.A. are forced to actively seek other solutions that can effectively minimise the acoustic impact of railway lines.

PKP Polskie Linie Kolejowe S.A., implementing the provisions referred to in Art. 179 of the Environmental Protection Act and Art. 7 point 2 of Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 related to the assessment and management of the environmental impact of noise, shall take the necessary measures to ensure that strategic noise maps presenting the situation in the preceding calendar year are drawn up and the approval of such maps by the competent authorities for all agglomerations and all major roads and railway lines in its territory. In 2016, the Company started to prepare a new acoustic map. The planned acoustic map includes 113 sections of railway lines which are 1372 km long.

Development measures taken by the Company include the issuing of opinions on local spatial development plans and studies of conditions and directions of spatial development of communes in order to reduce the number of residential buildings erected in the close vicinity of railway lines. In 2016, over 700 planning documents were analysed.

# Investments

## Financial framework 2014-2020

The investment activity of PKP Polskie Linie Kolejowe S.A. as the manager of the national railway network is aimed at improving the efficiency and performance of the Polish transport system through the realisation of an extensive investment programme including modernization of numerous railway lines.

The year 2016 was the second year in which the Company continued investment projects included in the National Railway Programme until 2023 (KPK) adopted in September 2015, updated in November 2016 and passed by means of the Resolution No 144/2016 of the Council of Ministers dated 23 November 2016.

The update of the KPK was in particular:

1. include in the program of verified schedules planned for the implementation of investments, which were originally accumulated in 2019 and 2020;
2. consideration of the possibility of implementing the investment program in terms of operational aspects and ensuring the efficiency of the railway network;
3. adjustment of the program to the revised transport policy objectives;
4. adjustment of the program to the actual progress of the preparatory works;
5. determining the actual value of projects resulting from a detailed analysis of the existing status in the Feasibility Studies for individual investments (the options selected from the studies include the necessary range of objectives needed to achieve the specified objectives, not differing from the assumptions i.e. at the stage of project ranking development and their assessment on the basis of the criteria described in the Implementation Document);
6. the fact of signing the Grant Agreement for the projects from the first call for proposal within the Connecting Europe Facility (CEF) by PKP Polskie Linie Kolejowe S.A.;
7. submission of applications by the Company in the second call of CEF;
8. the actual state of implementation of projects within the framework of the EU perspective for 2007-2013;
9. increase of funds allocated for the projects under the Regional Operational Programmes (ROP), with unchanged level of financing.

The main objective of the updated KPK is to strengthen the role of rail transport in the country's integrated transport system by creating a cohesive and modern railway

network, which stems directly from the provisions of the "Transport Development Strategy until 2020 (with a perspective until 2030)" in terms of rail transport.

The KPK specifies investment projects involving railway infrastructure managed by PKP Polskie Linie Kolejowe S.A. and assumes the maximum utilisation of EU funds for financing projects under: Operational Programme Infrastructure & Environment (OPI&E) for the years 2014-2020, CEF, Operational Programme Eastern Poland (OP EP) for the years 2014-2020; ROPs for the years 2014-2020. The programme also provides for continuing works under projects included in the MultiAnnual Railway Investment Programme that were not implemented by the end of 2015. Apart from EU funds, the implementation of the National Railway Programme is also to be financed using national public funds (state budget, Railway Fund), the Company's own resources and funds obtained from the issue of bonds. An important source of financing for the investment expenditures of PKP Polskie Linie Kolejowe S.A. are funds obtained from loans granted by the European Investment Bank (EIB) to cover the national share of non-eligible expenditures and partially pre-finance eligible expenditures.

The period of implementation and settlement of investments under the KPK coincides with the EU financial perspective for the years 2014-2020 and takes into consideration the n+3 rule, which means that the period of eligibility of expenditures ends on 31 December 2023. The expenditures of the KPK's basic list, after taking into account the refunds related to the projects within the perspective 2007-2013, amounts to PLN 66,330.4 million (in accordance with the amendment of KPK adopted in November 2016).

## Expected volume of funds available under the EU financial framework 2014-2020 by programmes

No.	Programme	Expenditures (PLN million)	Number of projects
1.	OPI&E	34 732,0	106
2.	CEF	14 605,8	17
3.	Budget	10 131,6	81
4.	ROP	4 766,8	61
5.	OP EP	2 094,2	10
<b>In total</b>		<b>66 330,4</b>	<b>275</b>

The detailed objectives of the National Railway Programme include: to improve the efficiency of rail transport, enhance rail transport safety and improve quality of passenger and freight transport.

It is assumed that the performance of objectives indicated in the KPK will raise parameters of the network managed by PKP Polskie Linie Kolejowe S.A. in such a way, so as to satisfy the needs of passengers and railway undertakings as well as consignors and consignees of cargo carried by rail. It will also lead to shorter travel times, raise the safety of rail transport, improve the comfort of travel and remove barriers to freight transport. One of the main objectives of the works planned under the financial perspective 2014-2020 is also to improve the safety of rail transport, including railway traffic. It is expected that the improvement of the parameters and condition of railway lines resulting from investment works will translate directly into the improvement of safety. This is particularly due to the modernization or revitalisation of railway superstructure, the replacement of traction network equipment and the modernization or development of modern computerised rail traffic control devices. These actions will increase the reliability of the security systems and will contribute to minimising the likelihood of potentially dangerous situations, such as the necessity to conduct rail traffic with the use of surrogate signals.

The implementation of the European Rail Traffic Management System (ERTMS) consisting of the European Train Control System (ETCS) and the Global System for Mobile Communications – Railways (GSM-R) has a significant influence on the increase of rail transports safety and the increase of the speed of trains over 160 km/h. The first projects in Poland for upgrading railway lines to the discussed system were implemented within the framework of the EU 2007-2013 perspective. As part of the investment projects co-financed by the EU budget 2014-2020, it is planned to continue the process of implementing the ERTMS system on the Polish railway network. The construction of animal passages or the adaptation of existing facilities and the installation of equipment for the deterrence of animals outside the railway line by means of acoustic or light signals (reflective) will also contribute to the improvement in safety.

In according with the provisions of KPK, each of the Program's specific objectives will be measured separately, according to a set of indicators that will simultaneously

allow for the assessment of the achievement of the main objective. These indicators include:

1. length of the rebuilt railway lines (in km of track);
2. the length of the railway lines which allow for the passage of passenger trains at a technical speed of over 160 km/h;
3. the length of the railway lines on which ERTMS/ETCS were built;
4. the number of regional centers connected by railway lines has been modernized to at least average passenger train speed 100 km/h.

Referring to the goals of the KPK, the emphasis must be put on the fact that the arrangement of the goals adopted in the document was subordinated to the necessity of implementing the Government's policy on railway transport, of which the basic principles are outlined above. In accordance with the provisions of KPK, the evaluation of the Program's implementation in this area will be made at the end of 2017 and 2023.

The basis for the investment activity carried out by PKP Polskie Linie Kolejowe S.A. in 2016, as in previous years, was the Company's Investment Plan (IP 2016) which assumed the implementation of projects financed using funds from the state budget, the Cohesion Fund, the Railway Fund and the Company's own resources.

The plan also included expenditures for projects implemented under almost completed ROP, OPI&E 2007-2013, including the so-called phased projects, the scopes of which were originally included in the 2007-2013 perspective, and which were divided into two phases during the phasing process - phase I, implemented at the end of the 2007 - 2013 perspective and phase II in the 2014-2020 perspective. The most important group in the IP 2016 included projects financed from the OPI&E 2014-2020, approx. 40% of which constituted phased projects implemented under the new perspective (i.e. phase II).

IP 2016 was adopted as the element of the Company's plan of activities by the Management Board of PKP Polskie Linie Kolejowe S.A. by means of a Resolution No 422/2016 dated 10 May 2016 and covered investment projects with a total value of PLN 4.3 billion. Within the IP 2016, more than 200 investment projects were accepted for implementation, including

80 new ones, in relation to which the first significant capital expenditures were incurred in 2016. The largest project in terms of expenditures included in the IP 2016 was the project relating to the modernization of the E75 Warszawa Rembertów-Sadowne line, phase II, financed from the OPI&E.

As indicated above, the IP 2016 adopted under the Company's plan of activities provided for the implementation of projects in the total amount of PLN 4.3 billion.

In terms of value, over 51% of the value of the IP 2016 was generated by 11 key projects (planned expenditures on each project for 2016 in the amount exceeding PLN 100 million). These investments included:

1. modernization of the E 75 Rail Baltica line, Warszawa – Białystok – Lithuanian border, stage I, Warszawa Rembertów – Zielonka – Tłuszcz (Sadowne) section, Phase II (OPI&E 5.1-4);
2. modernization of the E 30/C-E 30 railway line, Kraków - Rzeszów section, stage 3, Phase II (OPI&E 5.1-7);
3. modernization of the E 59 railway line on the Wrocław – Poznań section, Stage III, Czempień – Poznań section" Phase II (OPI&E 5.1-2);
4. modernization of railway line No. 8, Warszawa Okęcie – Radom section (LOT A, B, F) Phase II (OPI&E 5.1-3);
5. modernization of the E 30 railway line, Zabrze - Katowice - Kraków, section, stage IIb (CEF 14-20);
6. project of the improvement of railway access to the

Port of Gdańsk (bridge, two track railway) - Phase II (OPI&E 5.1-8);

7. improvement of traffic flow on the Łódź Railway Junction (TEN-T), stage I, Łódź Widzew - Łódź Fabryczna section (OPI&E 7.1-24.2);
8. modernization of railway line No. 4 - Centralna Magistrala Kolejowa (Central Trunk Line);
9. modernization of the E 65/C-E 65 railway line on the Warszawa – Gdynia section to the extent of the top layer of LCS, ERTMS, ETCS, GSM-R, defect detectors and traction network power supply systems - Phase II (OPI&E 5.1-1);
10. construction of the Kraków Zabłocie - Kraków Krzemionki railway siding (OPI&E 5.2-2);
11. works on the railway line No. 7 Warszawa Wschodnia railway station - Dorohusk on the Warszawa - Otwock - Dęblin - Lublin section, stage I (OPI&E 5.1-11.1);

IP 2016 was implemented at the level of PLN 4.1 billion (the amount includes the value of work in progress recorded as at 31 December 2016).

It should be emphasized that a high level of post-tender savings and savings resulting from other titles, such as land purchase, has a significant impact on the implementation of the Plan. The value of savings achieved in 2016 amounted to PLN 328.2 million and could be allocated by the Company for the financing of additional investment tasks.

#### The implementation of the capital expenditure plan according to programmes (including works in progress and excluding savings)[in PLN billion]

Implementation programme	Performance in 2016
Budget	1,2
CEF	0,2
Other (including FK, own resources)	0,5
OPI&E 14-20	1,8
OPI&E 7-13	0,5
ROP 14-20	0,003
ROP 7-13	0,003
<b>In total</b>	<b>4,1</b>

### Risk management

The implementation of the IP 2016 was analysed in detail, especially in terms of the ongoing identification and management of risks related to individual projects which had a possible impact on the failure to implement the Plan. Many of the monitored risks are events typical for the implementation of investment projects, but due to the scale of challenges and the complexity of railroad investments, they could significantly reduce the capital expenditures in 2016.

Depending on the length of the modernized section, the reconstruction of the line takes even several years and is carried out in stages due to the safe traffic operation and management. Delaying one step entails delaying another. The implementation of investments on time, in accordance with the schedule and the budget is affected by a lot of factors: proper performance of works in the construction phase, proper fulfilment of contractual obligations by contractors implementing modernization contracts or timely

supplies of materials and equipment by their subcontractors, effective investment preparation phase: design, obtaining administrative decisions from relevant offices and social consultations, implementation of environmental procedures in due time and precise planning of works by the contractor, taking traffic safety conditions into account. It should be emphasized that 2016 was a special period in terms of conducting and announcing tender procedures which will result in contracts concluded with contractors and capital expenditures starting from 2017. The delays that occurred in tender procedures were caused by:

- numerous appeals to the National Chamber of Appeal in relation to, among other things, prequalification results, provisions of the Terms of Reference and selection of contractors;

- submission of tenders the value of which exceeds the investor's cost estimate or can be considered as a grossly low and complete lack of tenders resulting in the worst case in the need to cancel the procedure and start a new tender procedure;
- calling contractors to provide explanations or supplement information, which prolongs the stage of the evaluation of submitted tenders;
- a significant number of requests to participate in restricted tender procedures, which prolongs the stage of the examination and assessment of applications.

## Investment expenditures by work

The scope of works under individual investment projects implemented by PKP Polskie Linie Kolejowe S.A. usually involves the comprehensive replacement of railway tracks, local control command and signalling equipment and electric power equipment (both traction and non-traction) as well as the modernization of level crossings and their removal and replacement with grade-separated junctions. The replacement of old, run-down and degraded railway infrastructure and technical equipment with new infrastructure and equipment made using modern technologies allows to significantly improve the operating parameters of railway lines (mainly maximum permissible speeds) while maintaining the same level of railway traffic security or even improving it.

The implementation of the IP 2016 on the railway network managed by PKP Polskie Linie Kolejowe S.A. included the performance of investment work involving, in particular, the modernization, revitalisation or construction of 509 km of tracks, 213 level crossings and construction or modernization of 47 grade-separated junctions. Modernization and revitalisation works covering track superstructure included the replacement of elements that play a crucial role in the prevention of the risk of derailment, namely turnouts (549 items).

### Performance of the work plan in 2016

No.	Item	Unit of measure	Total		
			PLAN for 2016	Performance (I-XII.2016)	% performance (I-XII.2016)
1.	Railway track modernization (including: repair of permanent way, subgrade, OC rails)	km of track	491,610	509,110	104%
2.	Installation of turnouts	items	606	549	91%
3.	Engineering structures, including:	items	434	352	81%
	3.1 Bridges	items	72	62	86%
	3.2 Viaducts	items	91	65	71%
	3.3 Culverts	items	271	225	83%
4.	Platforms	items	112	109	97%
5.	Traction network	tkm	523,930	478,970	91%
6.	Acoustic screens	km	111,860	69,650	62%
7.	Railway crossings (superstructure)	items	204	213	104%

As part of modernization and revitalisation projects currently in progress, PKP Polskie Linie Kolejowe S.A. is modifying level crossings and pedestrian crossings, equipping them with additional protection/warning solutions; moreover, level crossings and pedestrian crossings are being removed and replaced with viaducts, footbridges and tunnels.

In 2016, a total of 213 crossings on the network managed by the Company were modernized, including through the installation of automatic crossing signalling equipment

and CCTV equipment. Furthermore, 65 viaducts were modernized.

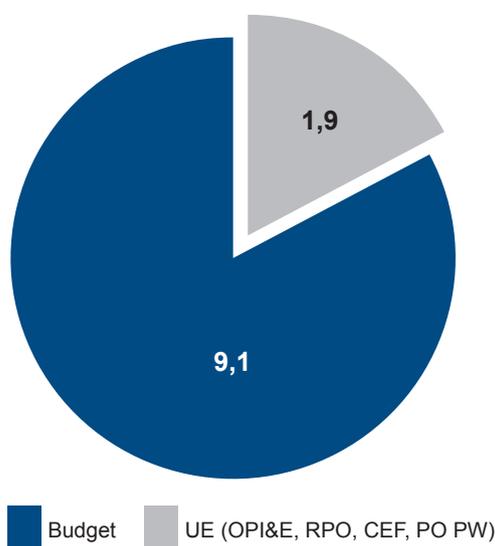
The technical acceptance of the Łódź Fabryczna railway station took place in the fourth quarter of 2016; it was opened for passengers on 11 December 2016. This is the largest investment of this type in the history of the Polish railway. The multimodal railway station that is worth almost PLN 1.8 billion, combines long-distance and commuter trains with regional and municipal bus and tramway transport and car traffic.

## Public procurement progress

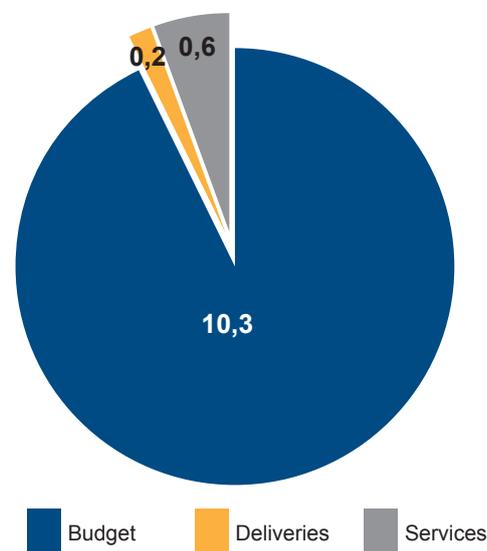
In 2016, PKP Polskie Linie Kolejowe S.A. announced tender procedures for the total amount of PLN 11.1 billion - according to the charts below, for which the Company already had a complete tender documentation at the time of announcing them unlike for the procedures announced in 2015. This fact indicates that the market of executive companies and suppliers, from the moment of initiation of the proceedings, had detailed knowledge of the specific investment objective. It is worth pointing out that according

to the assumptions from the beginning of 2016, the Company was going to announce tender procedures for a significantly lower amount i.e. for the value of approx. PLN 9.0 billion. The decision to speed up the finalisation of tender documentation and to announce the 2016 procedures was higher than expected; it prompted the conclusion of contracts with contractors and, as a result, the earlier beginning of works on investment tasks and earlier outflow of funds.

**Tender proceedings announced in 2016 according to programmes (PLN billion)**



**Tender procedures announced in 2016 according to the type (PLN billion)**



**More than 300 proceedings was announced in 2016. The biggest ones include:**

1. improvement of traffic flow on the Łódź Railway Junction (TEN-T), stage II, Łódź Fabryczna - Łódź Kaliska - Łódź Żabieniec section, OPI&E 201 4-2020 - estimated value PLN 1,763 million;
2. development of ERTMS-ETCS on TEN-T, CEF 201 4-2020 lines of the base network - estimated value of PLN 1 276.0 million;
3. work on the E20 railway line on the Siedlce - Terespol section, stage III - LCS Terespol, CEF 2014-2020 - estimated value PLN 538.5 million;

4. work on the railway line No. 1 on the Częstochowa-Zawiercie section, OPI&E 2014-2020 - estimated value PLN 491.8 million;
5. work on the railway lines No. 14, 811 on the Łódź Kaliska - Zduńska Wola - Ostrów Wielkopolski section, Stage I Łódź Kaliska - Zduńska Wola, CEF 2014-2020 estimated value PLN 469.6 million;
6. work on the E 30 railway line on the Kędzierzyn Koźle - Opole Zachodnie section, CEF 2014-2020 - PLN 478 million;
7. work on the railway lines No. 68, 565 on the Lublin - Stalowa Wola Rozwadów, along with its electrification, OP EP 2014-2020 - estimated value PLN 393.2 million;
8. work on railway line No. 25 on the Skarżysko Kamienna - Sandomierz section; OP EP 2014-2020 - estimated value PLN 360.9 million;
9. work on railway lines No. 153, 199, 681, 682 and 872 on the Toszek Północ - Rudziniec Gliwicki - Stare Koźle section, OPI&E 2014-2020 - estimated value PLN 331.7 million;
10. work on railway line No. 219 on the Szczytno - Elk section, OP EP 2014-2020 - estimated value PLN 323.2 million;
11. work on railway lines No. 31, 32 and 52 on the Czeremcha - Hajnówka section, OP EP 2014-2020 - estimated value PLN 287 million;
12. work on railway line No. 146 on the Wyczerpy - Chorzew Siemkowice section, OPI&E 2014-2020 - estimated value PLN 245.1 million;
13. work on railway lines No. 97, 98 and 99 on the - Skawina - Sucha Beskidzka - Chabówka - Zakopane section, State budget - estimated value PLN 235 million;
14. work on railway line No. 216 on the Działdowo - Olsztyn section, OP EP 2014-2020 - estimated value PLN 224.5 million;
15. work on railway line No. 94 on the Kraków Płaszów - Skawina - Oświęcim section, estimated value PLN 219.8 million;
16. revitalisation of railway line No. 207, voivodeship border - Malbork section, ROP 2014-2020 - estimated value PLN 211.3 million;
17. revitalisation of railway line No. 405, voivodeship border - Słupsk - Ustka section, ROP 2014-2020 - estimated value PLN 196 million;
18. revitalisation of railway line No. 210, Szczecinek - Runowo Pomorskie section, ROP 2014-2020 - estimated value PLN 172.7 million;

At the end of 2016, the Company conducted tendering procedures with a total value of PLN 28,702.9 million, including 76 ongoing proceedings for a total estimated value of PLN 17,663.6 million.

As a result of tendering procedures, in 2016 the Company concluded agreements for the amount of approximately PLN 2,595.5 million. Despite the tenders announced in 2015, the contracts for these proceedings will be concluded starting from the beginning of 2017. As indicated above, this is caused by the fact that almost all of these procedures were restricted tendering procedures and the documentation for these procedures was produced in 2016.

**Contracts for over PLN 2.3 billion out of contracts signed in 2016 were contracts for construction works. The biggest ones were related to:**

1. modernization of the E 30 railway line on the Zabrze - Katowice - Kraków section, stage IIb, CEF 2014-2020, 3 agreements at total amount of PLN 830.1 million;
2. improvement of the technical condition of engineering structures - stage I - modernization of the railway flyover in Gorzów Wielkopolski, PoliŚ 2014-2010 - value: PLN 90.5 million.

## More important issues related to changes in investments

1. Participation in the Polish Project Excellence Award, which awards significant achievements in the scope of project management and the second award in the 2016 edition for PKP Polskie Linie Kolejowe S.A. in the category: infrastructure projects from the International Project Management Association (IPMA Poland).
2. Regular field monitoring of investment projects, including key projects under construction works. In 2016, the monitoring team carried out 141 monitoring visits at construction sites, covering 26 key projects. Since September 2016, the frequency of monitoring visits has been increased for the following projects: "Modernization of railway line No. 8, Warszawa Okęcie - Radom section, LOT A" and "Modernization of the E75 Rail Baltica line, Warszawa - Białystok - Lithuanian border, stage I, Warszawa Rembertów - Zielonka - Tłuszcz (Sadowne) section". From

November 2016, monitoring of the selected projects necessary to obtain the track capacity required for the implementation of the 2016/2017 Timetable has begun.

The tasks of field inspectors include in particular:

- study on the scope of performed works in relation to accepted schedules and declared work stages completion dates;
- verification of the risks submitted by the project teams and identification of new ones.

The effect of each monitoring visit is a report containing information on project implementation, risks and recommendations for further actions.

3. In 2016, an optimisation of IT system for monitoring

- project progress (Enterprise Project Management system) was implemented, which included the introduction of new functionalities into the system and improvement of the quality of work of its users;
4. In 2016, the Company continued actions aimed to modify base documents. It is foreseen that these actions will comprehensively harmonise and standar-

dize documents concerning the implementation of investment projects used by PKP Polskie Linie Kolejowe S.A. in relations with contracts, which led to a more balanced responsibility of the parties for the implementation of the construction works.

## Sources of financing

### 1. Connecting Europe Facility (CEF)

#### 1st CEF Call for Applications

In the first CEF call for applications, settled in 2015, EU support was granted to all 7 projects submitted by PKP Polskie Linie Kolejowe S.A. within the national envelope. In 2015, Grant Agreements (GAs) with the Innovation and

Networks Executive Agency (INEA) were concluded for all projects. The total value of the CEF allocation utilised as part of the first call for applications amounted to approx. EUR 1.5 billion.

#### Projects under the 1st CEF call for applications according to data from Grant Agreements

No.	Project name	Total cost net (in EUR) as stated in the Grant Agreement	Value of CEF co-funding (in EUR) as stated in the Grant	Project implementation period as stated in the Grant Agreement
1.	Work on the E59 railway line on the Wrocław - Poznań section, stage IV, border of Dolnośląskie Voivodeship - Czempień section	364 831 476,63	280 081 124,61	2015-2020
2.	Work on the Warszawa Ring Railway (Warszawa Gołębki / Warszawa Zachodnia - Warszawa Gdańska section)	80 639 336,48	68 543 436,01	2015-2018
3.	Work on the E75 railway line on the Sadowne - Czyżew section, along with the remaining work on the Warszawa Rembertów - Sadowne section	244 018 223,00	185 941 885,93	2016-2020
4.	Work on the E20 railway line on the Warszawa - Poznań section along with the remaining work on the Sochaczew - Swarzędz section	614 308 666,47	461 775 824,59	2015-2020
5.	Work on Warszawa Włochy - Grodzisk Mazowiecki railway line (line No. 447)	82 694 851,41	61 599 394,82	2015-2020
6.	Work on the E 59 railway line, Poznań Główny - Szczecin Dąbie section	531 613 269,06	437 411 397,78	2015-2020
7.	Improvement of safety on the Central Trunk Line through the elimination of level crossings at km 127 and km 147, and construction of grade-separated junctions	4 137 510,00	3 516 883,50	2014-2016
<b>In total</b>		<b>1 922 243 333,05</b>	<b>1 498 869 947,24</b>	

### 2nd CEF Call for Applications

As part of the 2nd CEF call for applications resolved in 2016, 10 of the projects submitted by PKP Polskie Linie Kolejowe S.A. received the EU support within the national envelope. The total amount of the co-funding is approximately EUR 1.6 billion.

Grant Agreements (GAs) with INEA were concluded for all projects submitted in the second call for applications. Basic data on the basis of records of negotiations with INEA are presented in the following table.

#### Projects under the 2nd CEF call for applications according to data from Grant Agreements

No.	Project name	Total cost net (in EUR) as stated in the Grant Agreement	CEF grant Value (in EUR) as stated in the Grant Agreement	Project implementation period as stated in the Grant Agreement
1.	Work on the E75 railway line, Czyżew – Białystok section	397 384 532,00	302 807 013,00	2016-2020
2.	Modernization of the E30 railway line, Zabrze – Katowice – Kraków section, stage IIb	528 879 778,00	410 199 156,00	2015-2020
3.	Work on the E 30 railway line, Kraków Główny Towarowy – Rudzice section, along with the addition of metropolitan line tracks	395 863 769,00	320 332 962,00	2016-2020
4.	Work on railway lines No. 14 and 811 on the Łódź Kaliska - Zduńska Wola-Ostrów Wielkopolski section, stage I: Łódź Kaliska - Zduńska Wola	113 090 863,00	73 068 007,00	2016-2020
5.	Improvement of railway access to the port of Gdynia	190 865 406,00	162 235 595,00	2016-2020
6.	Improvement of railway access to sea ports in Szczecin and Świnoujście	143 668 747,00	122 118 435,00	2016-2020
7.	Improvement of railway access to the Port of Gdańsk	141 509 434,00	115 683 962,00	2016-2020
8.	Work on the E 20 railway line, Siedlce - Terespol section, stage III – LCCSC Terespol	131 007 575,00	109 522 333,00	2017-2020
9.	Electrification of railway lines No. 274 and 278, Węglińiec - Zgorzelec section	22 454 754,00	19 086 541,00	2017-2019
10.	Work on primary passenger lines (E 30 and E 65) within the Śląskie Voivodeship, stage I: the E 65 railway line, Będzin – Katowice – Tychy – Czechowice Dziedzice/ Zebrzydowice section - preparatory work	8 953 384,00	7 610 376,00	2017-2019
<b>In total</b>		<b>2 073 678 242,00</b>	<b>1 642 664 380,00</b>	

### 3rd CEF Call for Applications

On 13 October 2016, The European Commission (EC)/ INEA announced the third call for applications under CEF. The amount of approximately EUR 300 million was to be distributed under the national envelope. In 2016, PKP Polskie Linie Kolejowe S.A. submitted 5 applications under this contest, providing for co-funding in the total amount of EUR 1.7 billion. By virtue of savings estimated by

PKP Polskie Linie Kolejowe S.A. from the settled tendering procedures I and the 2nd call for applications under CEF, it is possible to increase the available allocation and thus to implement more of the projects submitted by PKP Polskie Linie Kolejowe S.A. under the 3rd CEF call for applications. Basic information according to data from applications are presented in the table below.

### Projects under the 3rd CEF call for applications according to data from applications

No.	Project name	Net project value (in EUR)	Value of CEF co-funding (in EUR)	Project implementation period
1.	Work on the E 75 railway line on the Białystok - Suwałki - Trakiszki (state border) section, stage I Białystok - Elk section	398 043 024,00	338 336 570,00	2017-2023
2.	Work on the E 30 railway line, Kędzierzyn Koźle - Opole Zachodnie	142 384 631,00	90 015 564,00	2017-202
3.	Work on primary passenger lines (E 30 and E 65) within the Śląskie Voivodeship, stage I: the E 65 railway line, Będzin – Katowice – Tychy – Czechowice Dziedzice - Zebrzydowice section	936 941 060,00	796 399 901,00	2017-2023
4.	Installation of the ERTMS/ ETCS systems on TEN-T core network lines	344 681 487,00	292 979 264,0	2017-2023
5.	Work on the C-E 20 railway line, Skierniewice – Piława – Łuków	227 409 696,00	193 298 242,00	2017-2020
<b>In total</b>		<b>2 049 459 898,00</b>	<b>1 711 029 541,00</b>	

## 2. Operational Programme Eastern Poland for the years 2014-2020 (OP EP 2014-2020)

OP EP 2014-2020 is an additional instrument supporting the economic and social development of 5 voivodeships in Eastern Poland. OP EP provides support to railway line comprising the so-called Eastern Trunk Line (a transport route that connects voivodeship capitals in the macro-region and runs through: Olsztyn - Korsze - Kętrzyn - Giżycko - Elk - Białystok - Czeremcha - Siedlce - Łuków – Dęblin - Lublin - Kraśnik - Tarnobrzeg - Kolbuszowa

- Rzeszów, with a branch line to Kielce through: Tarnobrzeg - Ostrowiec Świętokrzyski - Skarżysko Kamienna). OP EP provides co-funding to railway line infrastructure projects as well as investments in nodal infrastructure, i.e. passenger service facilities (stops, shelters, pedestrian overpasses), level crossings and other engineering structures.

### Implementation framework for priority axis III: Railway infrastructure OP EP 2014-2020

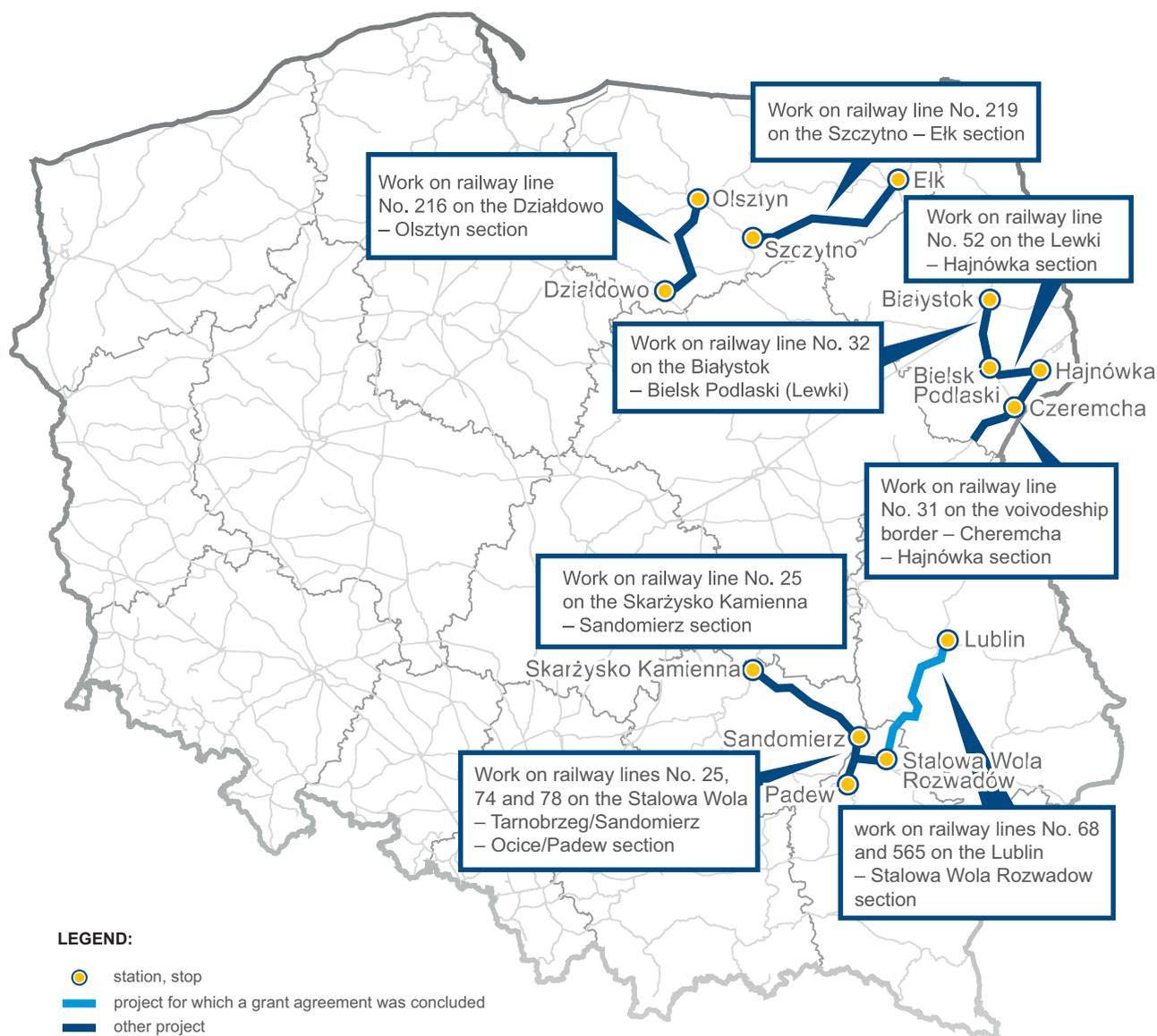
Type of indicator	Indicator	Unit of measure	Intermediate target (2018)	Ultimate target (2023)
Product indicator	Total length of modified or modernised railway lines	km	0	548
Key stage of implementation	Total length of modified or modernised railway lines in concluded grant agreements	km	240	-
Financial indicator	Total amount of certified eligible expenditures	Euro	55 259 495	388 713 790

Under OP EP 2014-2020, PKP Polskie Linie Kolejowe S.A. is implementing 8 projects:

- work on railway lines No. 68 and 565, Lublin - Stalowa Wola Rozwadów section, along with its electrification;
- work on railway lines No. 25, 74 and 708, Stalowa Wola - Tarnobrzeg/Sandomierz - Ocice/Padew;
- work on railway line No. 25, Skarżysko Kamienna - Sandomierz section;
- work on railway line No. 32, Białystok - Bielsk Podlaski (Lewki) section;

5. work on railway line No. 31, voivodeship border – Czeremcha – Hajnówka section;
6. work on railway line No. 52, Lewki - Hajnówka section;
7. work on railway line No. 216, Działdowo - Olsztyn section;
8. work on railway line No. 219, Szczytno - Elk section.

Map presenting the location projects under OP EP 2014-2020



In 2016, PKP Polskie Linie Kolejowe S.A. submitted an application for co-funding and concluded a Grant Agreement (GA) for the project titled “Work on railway lines No. 68 and 565, Lublin - Stalowa Wola Rozwadow section, along with its electrification.” Total cost planned for the project imple-

mentation amounts to PLN 568,995,978.47, implementation period 2017-2020. Furthermore, tendering procedures for construction works within the formula Design and Build were announced for 7 projects in 2016.

### 3. Operational Programme Infrastructure & Environment for the years 2014-2020 (OPI&E 2014-2020)

Under OPI&E 2014-2020, PKP Polskie Linie Kolejowe S.A. are implementing projects within the Priority V: Development of rail transport in Poland. The aforementioned priority provides co-funding to investments in modernization or restoration of the existing railway routes within the TEN-T network (Transeuropean Network - Transport),

contributing to the improvement of railway connections between the major Polish cities. Projects are also implemented to improve the railway system outside the TEN-T network and within urban agglomerations (urban railway).

#### Implementation framework for priority axis V: Development of rail transport in Poland

Type of indicator	Indicator	Unit of measure	Intermediate value	Ultimate value (2023)
Product indicator	Total length of modified or modernized railway lines	km	0	625
Key stage of implementation	Total length of modified or modernized railway lines as stated in grant agreements	km	281	-
Financial indicator	Total amount of certified eligible expenditures	Euro	589 376 471	5 893 764 706

Within the financial framework of OPI&E 2014-2020, PKP Polskie Linie Kolejowe S.A. concluded 12 GAs with the Centre for EU Transport Projects, including GAs concluded in 2015 for all 8 projects implemented in phases,

i.e. projects divided into two financial perspectives (Phase I to be realised in perspective 2007-2013 and Phase II to be realised in perspective 2014-2020).

#### Value of concluded GAs for projects under OPI&E 2014-2020

Year of agreement conclusion	Number of concluded GAs	Total net cost (in PLN thousand)	Value of EU co-funding (in PLN thousand)
2015	8	3 232 211,10	2 406 669,82
2016	4	4 363 919,26	3 552 417,42
<b>In total</b>	<b>12</b>	<b>7 596 130,36</b>	<b>5 959 087,24</b>

In 2016, 4 GAs were concluded with a total value of PLN 4,363,919.26 thousand, including the EU co-funding that amounted to PLN 3,552,417.42 thousand.

#### Projects under OPI&E 2014-2020 for which the GAs were concluded in 2016

No.	Project name	Total net cost (in PLN thousand)	Value of EU co-funding (in PLN thousand)
1.	Work on railway line No. 7 Warszawa Wschodnia railway station - Dorohusk, Warszawa - Otwock - Dęblin - Lublin section, stage I	3 460 506,33	2 920 568,21
2.	Work on railway line No. 7 Warszawa Wschodnia railway station - Dorohusk, Warszawa - Otwock - Dęblin - Lublin section, stage II	513 500,95	363 278,82
3.	Construction of the Kraków Zabłocie - Kraków Krzemionki railway siding	294 858,06	187 774,58
4.	Improvement of the technical condition of engineering structures stage I - Modernization of the flyover in Gorzów Wielkopolski	95 053,90	80 795,82
	<b>In total</b>	<b>4 363 919,26</b>	<b>3 552 417,42</b>

Furthermore, in 2016 PKP Polskie Linie Kolejowe S.A. submitted 11 applications for co-funding for a total value of PLN 8,449,408.03 thousand, projects is presented

in the following table. The co-financing value under the applications for co-funding of particular including the EU co-funding that amounted to PLN 6,776,137.32 thousand.

#### Projects under OPI&E for which applications for co-funding were concluded in 2016

No.	Project name	Total net cost (in PLN thousand)	Value of EU co-funding (in PLN thousand)
1.	Work on railway line No. 7 Warszawa Wschodnia railway station - Dorohusk, Warszawa - Otwock - Dęblin - Lublin section, stage I	3 806 556,97	3 235 573,42
2.	Work on railway line No. 7 Warszawa Wschodnia railway station - Dorohusk, Warszawa - Otwock - Dęblin - Lublin section, stage II	694 766,79	399 606,70
3.	Improvement of traffic flow on the Łódź Railway Junction (TEN-T), stage II, Łódź Fabryczna - Łódź Kaliska/Łódź Żabieniec section	2 106 485,34	1 790 512,54
4.	Improvement of the technical condition of engineering structures stage I - Modernization of the flyover in Gorzów Wielkopolski	100 780,19	76 068,89
5.	Improvement of the capacity of the railway line E 20, Warszawa Rembertów-Mińsk Mazowiecki -section, stage I: Work on traffic posts	113 769,54	78 823,52
6.	Improvement of the technical condition of passenger service infrastructure (including adaptation to the requirements of TSI PRM), Stage II Gdańsk Główny railway station	65 659,00	55 763,40
7.	Construction of the Kraków Zabłocie - Kraków Krzemionki railway siding	318 102,10	206 552,03
8.	Work on the railway line no. 146 on the Wyczerpy - Chorzew Siemkowice	275 155,04	193 139,57
9.	Work on the railway lines No. 140, 148, 157, 159, 173, 689, 691 on the Chybie-Zory-Rybnik-Nędza/Turze section	552 640,00	386 928,13
10.	Improvement of the technical condition of engineering structures stage I - Modernization of the flyover in Gorzów Wielkopolski	104 559,29	88 875,40
11.	Work on the railway lines No. 153, 199, 681, 682 and 872 on the Toszek Północ - Rudzieniec Gliwicki - Stare Koźle section	310 933,77	264 293,70
<b>In total</b>		<b>8 449 408,03</b>	<b>6 776 137,32</b>

#### 4. Regional Operational Programmes (ROP) to be implemented in the perspective 2014-2020

The National Railway Programme (KPK) dated 15 September 2016 provides for the implementation of 51 projects from the primary list as part of ROPs in 16 voivodeships. In 2016, a GA was concluded under the ROP 2014-2020 for the project based in Pomorskie voivodeship titled "Revitalisation of railway line No. 207, voivodeship border - Kwidzyn - Malbork" Furthermore, in 2016 applications for co-funding were submitted for the projects:

1. revitalisation of railway line No. 405, voivodeship border - Słupsk - Ustka section (Pomorskie ROP);
2. revitalisation of railway line No. 354, Poznań Główny

POD - Chodzież - Piła Główna section, under Wielkopolska ROP.

In 2016, as part of ROP 2014-2020, PKP Polskie Linie Kolejowe S.A. announced a tender procedure for the design and performance of construction works for the project titled "Modernization of railway line No. 354, Poznań Główny POD - Chodzież - Piła Główna."

## Investment Forum

The Investment Forum (IF) was established on the initiative of PKP Polskie Linie Kolejowe S.A. The inaugural meeting of the IF was held on 12 December 2012. The Forum serves as a communication platform between the managing authority, the intermediate body, the implementing body as well as enterprises and the beneficiary. It enables effective cooperation, exchange of experiences and the introduction of changes with respect to a faster implementation of railway investments.

As part of the Investment Forum, the Forum Board comprising a representative of the Company, Contractors and a representative of the Ministry competent for transport was established. Work is carried out in the form of meetings held by 6 Working Groups:

1. Designer and Service Provider;
2. Engineer;

3. Selection Criteria;
4. Contractual Provisions;
5. Institutional Technology;
6. Legislation (this group has not yet commenced activity).

In the fourth year of operation of IF, the market of contractors recorded positive changes. It was indicated that the direction of activities is good because a lot of positive changes were achieved; however, the implemented solutions are not yet fully satisfying for any of the parties.

In 2016, 14 meetings within the Working Parties were held with the active participation of the contractors, representatives of the Centre for EU Transport Projects, the Public Procurement Office, the Ministry competent for transport, the Ministry competent for development and the Management Board of PKP Polskie Linie Kolejowe S.A.

### The effects achieved in 2016 within particular Working Parties

Within the framework of works of particular IF Working Parties, the following changes, directly influencing the acceleration of implementation of railway investments, were introduced:

#### 1. Working Party Engineer

- visible changes were introduced for the Engineers, a postulate was included - evaluation of offers on the basis of price and other criteria in a relation 40:60, where price is 40%;
- drawing up a list of non-price criteria that will be applied within the 60%, i.e.
  - contractor's staff experience - 30%;
  - methodology - including key elements of the project, mitigation of the risks, qualitative assessment (approved by means of the amendment to the Public Procurement Law), interview with a selected key personnel - 20%;
  - case - 10% (under this criterion, the contractor shall draw up a written solution to the problematic situation presented by the contracting entity related to the performance of the contract and implementation of the Public Procurement Law);
- introduction of the possibility for the engineer to terminate the contract (in previous contracts the engineer had to remain with the Contractor until the expiration of contract, regardless of how long it lasted);
- increase of the fixed part of remuneration for the engineer in 50:50 proportion between the fixed and variable costs;
- it was established that the number of required tests will be indicated by the contracting entity and will be valued in the offer, and will not be a criterion for evaluation as it was so far.

#### 2. Technical Working Party and Working Party Contractual Provisions

- it was assumed that payment for the purchased and delivered materials and devices amounts to 90% of their value;
- a function enabling payment for devices and materials in the amount of up to 25% of the accepted contract price;
- it was agreed that the amount of the conditional payment would be no more than 10-15% of the value of the works;
- deletion of 3 penalties from the catalogue, the addition of 1 penalty to the contractor for the projects implemented in the "design and build" system. In addition, it was prohibited to impose more than one penalty for the same event, and the upper limit of the contractual penalties imposed at 30% of the value of the agreed contract amount was established;
- a function enabling to grant an advance of up to 10% of the accepted contract amount was introduced;
- price valorisation was introduced;
- more frequent payments per month were allowed (more than 1 payment per month);
- it was agreed to extend the applicable non-price criteria in tenders;
- verification of the parties' risks in the executed contracts.

### 3. Working Party Selection Criteria

The following selection criteria for “build” and “design and build” projects were established:

- the price may cover a maximum of 60%;
- the implementation deadline covers 20% (modification of the criterion consisting in its inclusion in both

#### Other information

At the end of 2016 Plenary IF was organized with the participation of about 150 people, including the representatives of the state administration, the Company and the contractors. The official part of the meeting involved handing over the nomination to the Expert Advisory Board for measures aimed at optimising the process of realisation of railway investments were opened by the Minister competent for transport. In the next part of the meeting, the current work of the IF was summarised, but above all, the challenges facing the contracting entity in the perspective of the coming years were discussed.

The Board was appointed by the Minister responsible for transport at the request of IF, among the entities related to the railway industry. The nominations were received by the Leaders of particular Working Parties and represen-

of the Chamber of Commerce of Land Transport (IGTL), the Railway the deadline for implementation of the contract as well as the sub-criterion concerning track closures time);

- contractor’s staff experience covers 20%.

tatives Business Forum, the Association of Engineers and Technicians of Transportation (SITK RP), the Association of Experts and Managers of Railway Transport, the Railway Institute, the IGTL Railway Undertaking, the Ministry competent for transport, PKP Polskie Linie Kolejowe S.A., the Centre for EU Transport Projects. The aim of the committee is to develop guidelines and recommendations based on the solutions discussed by the Working Parties Forum.

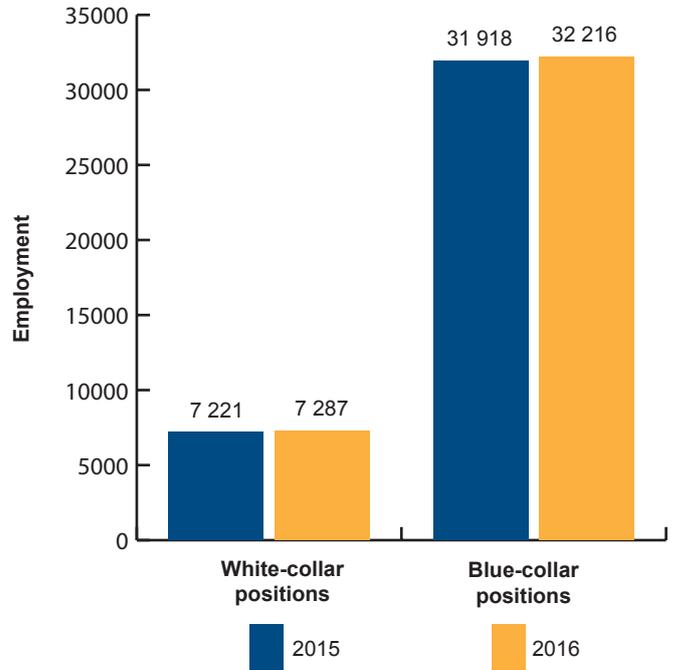
The participants expressed their willingness to continue works and dialogue within the Working Parties to further develop a catalogue of changes and to work out a compromise that could have a positive impact on accelerating railway investments.

# Human resources

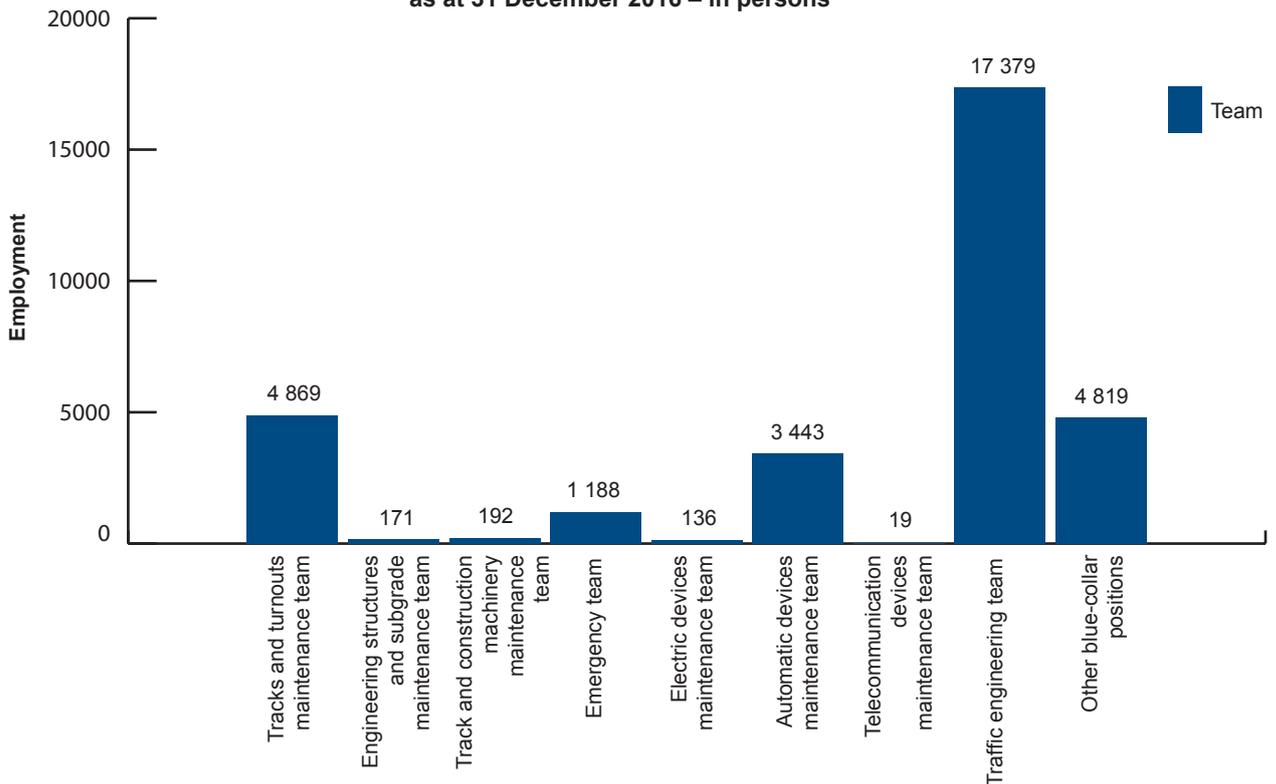
## Employment analysis

In 2016, the employment level at the Company increased by 364 people compared to 2015 and amounted to 39,503 employees. As regards the blue-collar positions, the employment level increased from 31,918 employees (as of December 31, 2015) to 32,216 employees (as of December 31, 2016), i.e. the employment level went up by 298 people (0.93%). As regards the white-collar positions, the employment level increased from 7,221 employees (as of December 31, 2015) to 7,287 employees (as of December 31, 2016) i.e. the employment level went up by 66 people (0.91%).

Employment by occupation groups as of December 31, 2016- in persons



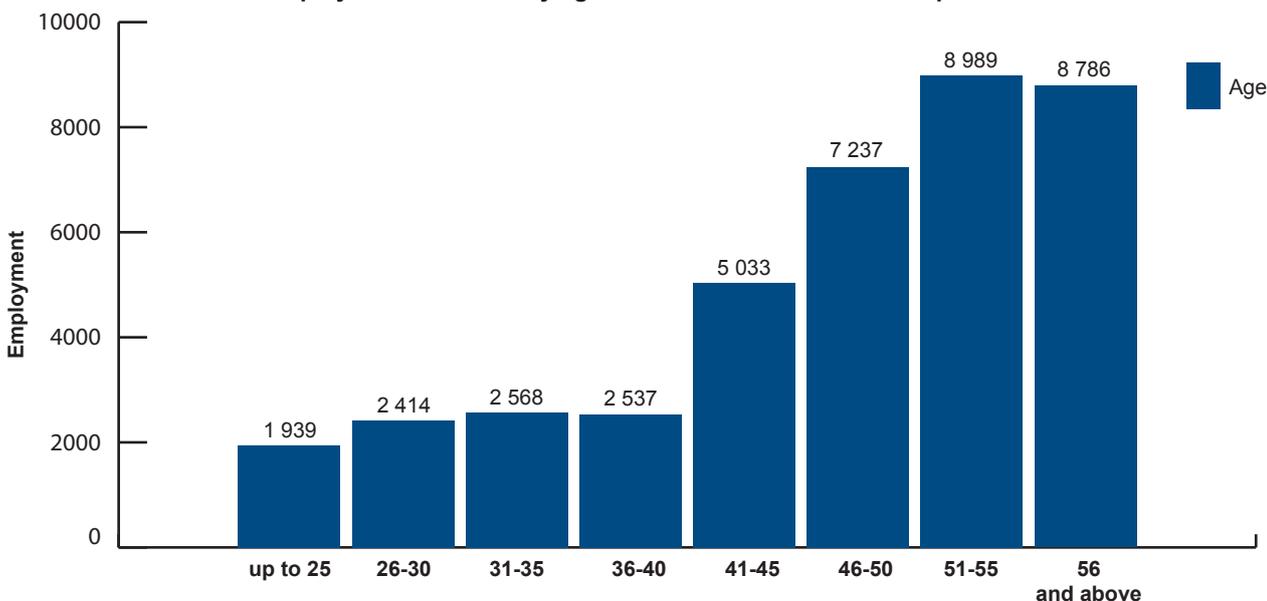
Employment at blue-collar positions as at 31 December 2016 – in persons



In 2016, the employment structure by age also changed. The employees aged 25 and less comprised 4.91% of the entire workforce (1,939 employees) – in this category, the number of employees increased by 242 employees, i.e. 14.26%. The employees aged 26-50 are the largest group in the Company (who are people in the period of their most intensive professional activity). They comprised

50.09% of the entire staff (19,789 employees) in 2016. In this category, there was a decrease in the employment level by 356 employees, i.e. 1.77%. The third category are persons aged 51 and more. In 2016, they comprised 45.00% of the entire staff (17,775 employees). In this group, the employment level grew by 478 employees, i.e. by 2.76%.

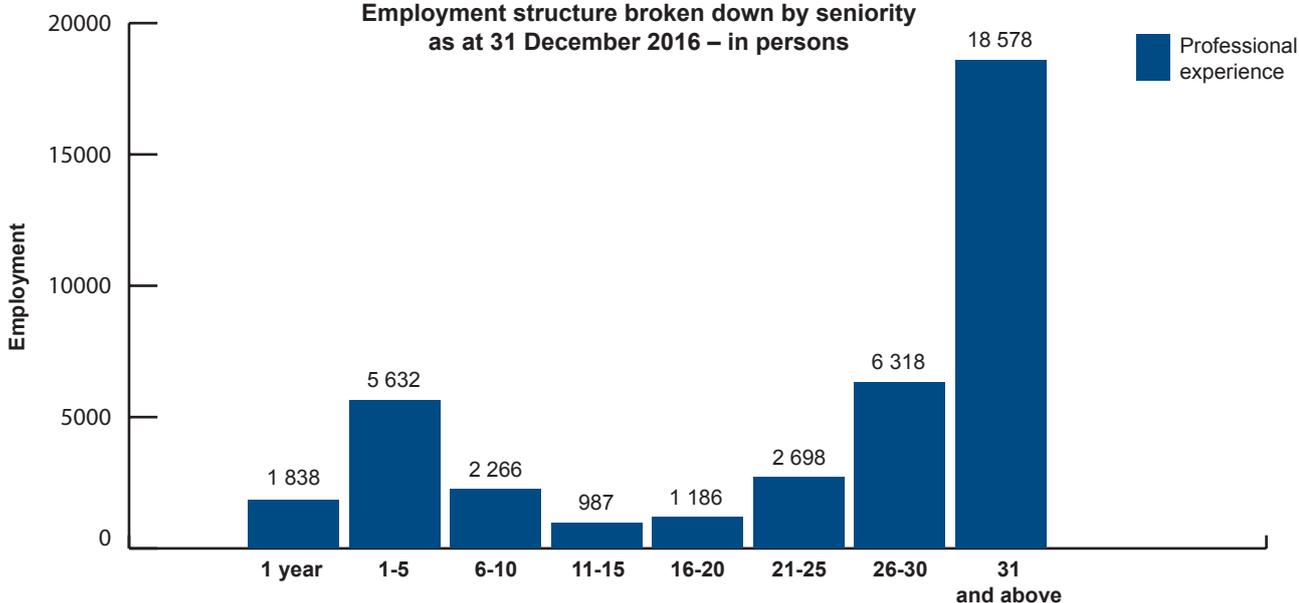
Employment structure by age as at 31 December 2016 – in persons



Employees with up to 10 years of seniority at the Company comprised 24.65% of the staff (9,736 persons) – this group recorded an increase by 1,403 employees, i.e. by 16.84% (compared to 31 December 2015). Employees with 11 to 20 years of seniority comprised 5.50% of the entire staff (2,173 persons), which means a decrease by

270 employees, i.e. 11.05% (compared to 31 December 2015). The most numerous group at the Company were with more than 21 years of seniority, who comprised 69.85% of the total number of employees (27,594 persons). In comparison to 31 December 2015, this group recorded a decrease by 769 employees, i.e. by 2.71%.

Employment structure broken down by seniority as at 31 December 2016 – in persons

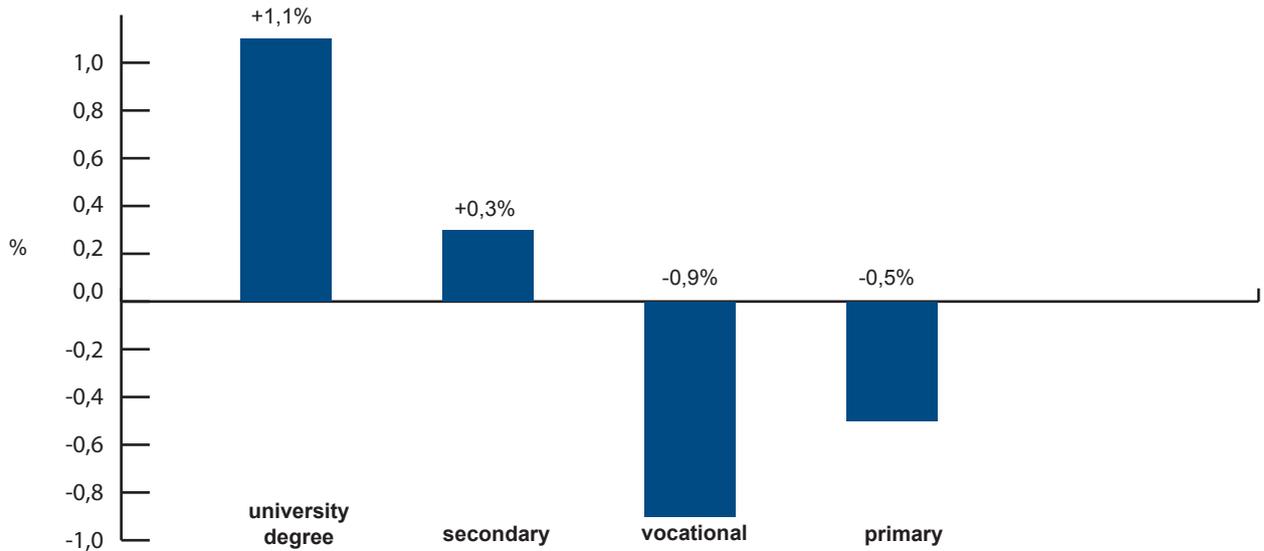


## Staff development

In 2016, we observed further positive developments in terms of the employment structure by education. The most important factor in this case was the increase in the number of employees with an academic degree with the simultaneous decrease in the number of people with

secondary, basic vocational, or primary education. This results from the Company's policy which aims at recruiting highly-qualified employees and implementing continuous education programmes for the staff.

Change in education in 2016 (%)



# External communication

## Celebration of the 15th anniversary of PKP Polskie Linie Kolejowe S.A.

In 2016, 15 years of PKP Polskie Linie Kolejowe S.A. activity have passed. On this occasion, on 24 September 2016 in Jabłonna near Warszawa, a picnic was organized, for which nearly 1,800 employees chosen by lot arrived delegated to

ensure safety of the travelling pilgrims every day. The Company prepared itself to many attractions and sports, culinary and handicraft surprises awaited the participants.

## 85 years of the building – registered offices PKP Polskie Linie Kolejowe S.A.

In 2016, 85 years have passed since putting the buildings of PKP Polskie Linie Kolejowe S.A. into use. Since 1987 the building has been included in the register of monuments of the Capital City of Warszawa. It was built following

a design by Marian Lalewicz, a well-known architect of the pre-war capital. It is a complex of five office buildings and two residential buildings. The whole is set on the plan of the letter H.

## World Youth Day

In 2016, PKP Polskie Linie Kolejowe S.A. on the occasion of the World Youth Day they have carried out repair and aesthetisation works at the stations and stops that served travelers during the event. The above mentioned works ensured safety and comfort of pilgrims during the journey. Made to repairs of platform surfaces, lighting, reconstruction of traction network, installation of elements of small architecture and shelters. Special markings appeared on train stations, 24-hour announcements in English and Polish were performed, and about 200 mobile informants were of assistance to the passengers. 600 additional officers of the Railway Security Guard were carry a large number of passengers. The capacity of railway lines on the routes of the three lines transporting pilgrims to

Kraków was tripled, reaching half a million passengers a day. More than 1,000 dispatchers and the Railway technical emergency response service watched over the train traffic safety. Additional locomotives and specialised trains for network repairs and malfunctions elimination were installed on the routes in case of a potential emergency. In 2016, PKP Polskie Linie Kolejowe S.A. posted information for pilgrims in seven languages on a specially created bookmark on the Company's website and on the profiles on Facebook and Twitter.

## SAP HANA – a prestigious award in the IT industry

In 2016, PKP Polskie Linie Kolejowe S.A. received an Innovation of the Year Award in 2016. Upon granting the award, the Jury appreciated the Company for the rapid process of modernization of the data distribution system and the introduction of the SAP HANA platform in the financial and accounting area. Due to the operations carried out in the middle of the year, the time needed to draw up a report was reduced (from several hours to few minutes), which resulted in better decision making and more effec-

tive management of e.g. investment process. The system streamlines the work of nearly 3,000 Company employees who use analytical data on a daily basis and helps them make strategic business decisions faster.

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## Official Company profile on social networking site Facebook

In 2016, PKP Polskie Linie Kolejowe S.A. have gathered in their profile in 2016 a large community that exceeded 20 thousand users. It's a great success for a company that does not sell services, just like carriers, but is a railway infrastructure manager and passengers are not its direct customers. However, there are a large number of users who are interested in ongoing investments, changes in passenger infrastructure, rail safety and timetables.

Although the number of fans of the company's official

profile exceeds 20 thousand, publications reach as many as 100 or 200 thousand users a week. Any share, comment, or "like" button means that the content is seen by friends of the active users.

On the profile of PKP Polskie Linie Kolejowe S.A. a Passenger's Portal was created, visited annually by nearly 4 million people a tab "Your Train", which acts as a search engine for railway connections.

# Contact details

## Company's Head Office

Targowa 74 street  
03-734 Warszawa

[www.plk-sa.pl](http://www.plk-sa.pl)  
[www.plk-inwestycje.pl](http://www.plk-inwestycje.pl)  
[www.bezpieczny-przejazd.pl](http://www.bezpieczny-przejazd.pl)  
[www.kgsok.pl](http://www.kgsok.pl)

## Board Administrative Department

phone: (22) 473 25 65  
fax: (22) 473 25 67  
mail: [ibz@plk-sa.pl](mailto:ibz@plk-sa.pl)

## Communications and Promotion Department

phone: (22) 473 23 38  
fax: (22) 473 23 34  
mail: [iip@plk-sa.pl](mailto:iip@plk-sa.pl)

## Logistics Department

phone: (22) 473 33 26  
phone: (22) 473 24 69  
mail: [ilg@plk-sa.pl](mailto:ilg@plk-sa.pl)

## Sales Department

phone: (22) 473 20 30  
fax: (22) 473 28 04  
mail: [ius@plk-sa.pl](mailto:ius@plk-sa.pl)

## Investment Implementation Department

phone: (22) 473 21 53  
fax: (22) 473 21 54  
mail: [ir@plk-sa.pl](mailto:ir@plk-sa.pl) or [centrum.ir@plk-sa.pl](mailto:centrum.ir@plk-sa.pl)

## Spokesperson

phone: (22) 473 30 02  
phone: (+48) 662 114 900  
mail: [rzecznik@plk-sa.pl](mailto:rzecznik@plk-sa.pl)

