METROREX S.A.

ACTIVITY REPORT
2015

C O N T E N T

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Chapter 1. Background

In 1977, it was set up "Întreprinderea de Exploatare a Metroului", which in 1991 turned into "Regia de Exploatare a Metroului Bucureşti" and, by reorganization, according to the Government Decision no. 482/1999, it became "Societatea Comercială de Transport cu Metroul Bucureşti METROREX S.A.", under the authority of the Ministry of Transports and Infrastructure having as scope of activity "*the passengers transport with metro using the ground and underground railway network under specific safety traffic and comfort conditions*".

METROREX is a joint-stock company owned by the state performing activities of public and strategic interest.

For these services, METROREX receives money transfers from the state budget to cover the differences between its own revenues resulted from the passengers transport activity and the total expenses, as subsidy to the related fare trip.

The infrastructure and technological installation operation, maintenance and repair are performed by the existing personnel of **4.218 employees**, distributed in main sub-divisions, as follows: electro-energetic, electro-mechanic, automatic lines block signalling installation, automation and telecommunications, lines-tunnels, metro stations administration and maintenance, traffic control, commercial, depots.

Starting with July 1st, 2004, further the contract signature in November 2003, and approved by the Government Decision no. 47/22.01.2004, the rolling stock maintenance and repair activity was taken over by S.C. Transport ALSTOM S.A for a period of 15 years.

On July 1st, 2011, there were commissioned two new transport capacities on Metro Line 4, section from 1 Mai to Parc Bazilescu of 2,3 km length, double track, and two new stations were added: Jiului and Parc Bazilescu.

Built, equipped and put into operation in stages, on certain extensions, starting with 1979, the metro network is currently integrating **69,20 km** double track, structured on **4** metro **lines**, **51** metro **stations** and **4 depots**.

The metro transport system is continuously monitored and coordinated by a Central Traffic Control, which subordinates some other six branch dispatching centres: lines, tunnels, stations, passengers' information, traffic control, electro-energetic, electro-mechanic and commercial.

METROREX market share

Although it covers only 4% of the Bucharest entire public transport network, by providing a high transport capacity due to its comfort, regularity and safety traffic conditions, Metrorex supplies transportation for about 20% of the total passengers using the Bucharest urban public transportation means.

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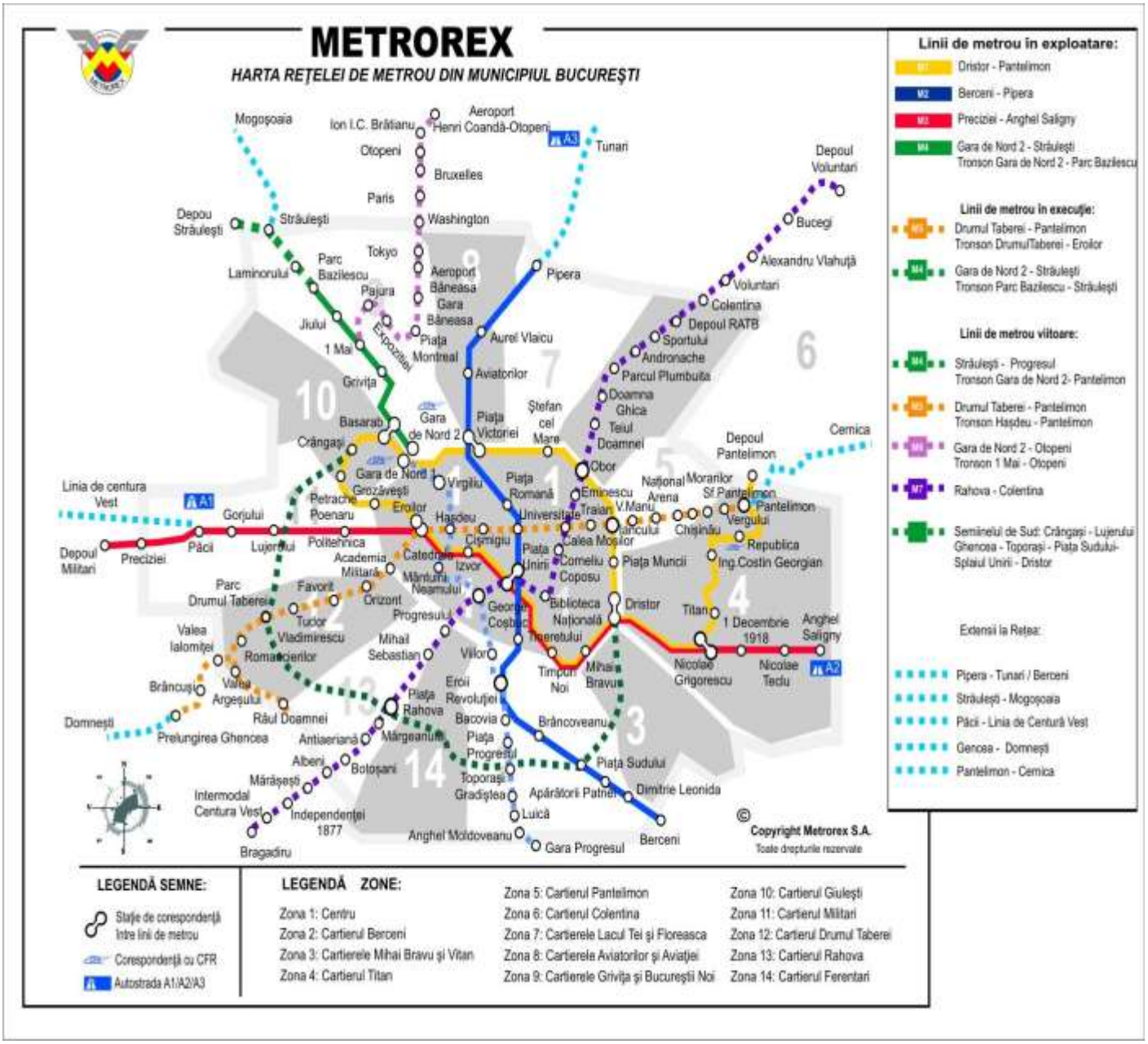
Chapter 2. Bucharest metro network



The operating metro network is structured as follows:

Metro Line/ Extension	Route	Km	Stations	Commissioned
Metro Line I	**PANTELIMON – REPUBLICA – EROILOR - GARA DE NORD – DRISTOR 2**	**31.01**	**21 (out of which, 7 common stations with Metro Line III)**	*In stages 1979 - 1990*
Extension	*Petrache Poenaru - Timpuri Noi*	*8.63*	*6*	*November 1979*
Extension	*Timpuri Noi - Republica*	*10.10*	*6*	*December 1981*
Extension	*Petrache Poenaru - Crângaşi*	*0.97*	*1*	*December 1984*
Extension	*Crângaşi - Gara de Nord*	*2.83*	*2*	*December 1987*
Extension	*Gara de Nord - Dristor 2*	*7.8*	*6*	*December 1989*
Extension	*Republica – Pantelimon*	*0,68*	*1*	*January 1990*
Metro line II	**BERCENI - PIPERA**	18.68	14	
Extension	*Berceni – Piața Unirii 2*	*9.96*	*8*	*January 1986*
Extension	*Piata Unirii 2 - Pipera*	*8.72*	*6*	*October 1987*
Metro Line III	**ANGHEL SALIGNY – N. GRIGORESCU – EROILOR - PRECIZIEI**	***22.2***	**15 (7 common stations with Metro Line I)**	
Extension	*N. Grigorescu – Eroilor*	*8,67*		
Extension	*Eroilor – Preciziei*	*8,83*	*5*	*August 1983*
	Gorjului – Platform 1 - Platform 2			*July 1996 November 1999*
Extension	*N. Grigorescu 2 – Anghel Saligny*	*4,7*	*4*	*November 2008*
Metro Line IV	**LAC STRĂULEŞTI – GARA DE NORD – GARA PROGRESU**	**5,54**	**6**	
Extension	*Gara de Nord – 1 Mai*	*3,24*	**4**	*March 2000*
Extension	*1 Mai – Parc Bazilescu*	*2,3*	**2**	*July 2011*

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Chapter 3. Calendar of events in 2015

3.1. Modernisations, upgrading

In compliance with the medium term modernisation and development strategy of Bucharest metro, in 2015, there were performed several actions related to the metro network extension and also continued the modernisation and technological upgrading works of the hereinafter fixed infrastructure installation, as here below:

- The project for equipping each elevator with phone system and video camera was completed. Currently, in the metro network operates 93 elevators (40 with electric drive and 53 with hydraulic drive) and 3 inclined platforms.
- The control access and automatic fare collection installations extension was completed, by mounting and integrating specific access gates for passengers using the wheelchair.
- A new escalator was mounted at Dristor station.
- There were rehabilitated the discharge pipes of the wastewater pumping stations in Lujerului and Politehnica metro stations, and in the future, depending on the allocated financial resources, this kind of works will be performed in other stations, too.
- There were commenced the modernisation works of the ventilation installations on the extension from Petrache Poenaru to Timpuri Noi, based upon the contract signed for installations modernisation works on Metro Lines 1, 2, 3 and the connection link.

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3.2. Traffic and rolling stock fleet improvement

1. Upon Metrorex S.A. request, Alstom Transport S.A. has purchased rectifying apparatus for charging the batteries, in order to equip all depots (Ciurel, Militari, Pantelimon and Berceni) where the maintenance of the metro trains and the five hydraulic engines is performed.

This action will bring substantial fuel savings for Metrorex S.A. as using these rectifiers for charging the batteries of the five diesel hydraulic engines would no longer require to keep them into operation in stationary mode for charging the batteries.

Also, due to the same reason, the working conditions of Metrorex S.A. and Alstom Transport S.A. staff, working in Metrorex S.A. depots, will improve by removing pollutants that occurred when charging the batteries of the five diesel hydraulic engines operating in stationary mode in the depot.

2. In order to improve the public service for passengers, as of May 4, 2015, on Metro Line 1, it was implemented A1343 timetable, so the shuttle train between Republica and Pantelimon stations was excluded, and there were introduced direct metro trains between Dristor 2 and Pantelimon stations.

3.3 Trip and access conditions improvement

Metrorex completed the procurement procedure for the modernisation of the fare collection system and the involved works would be developed this year. Therefore, there were procured access gates incorporating modern validators able to accept both magnetic tickets,

Mifare cards, enabling compatibility with the access systems used by other public transport operators, and also contactless bank cards (type *Paywave*, *PayPass* or similar).

An important component is the procurement automatic vending machines for tickets, so that in almost every metro stations access to be at least two such automatic machines equipped both for bank card payments and providing rest and loading contactless cards. The old automatic vending machines shall be upgraded within the same contract enabling the features of the new ones.

Another important feature of the modernized fare collection system is the contactless cards loading / reloading, leading the way for full integration with other transport operators. Last but not least, the access gates will have a modern design, convenient for passengers, but mostly they will be reversible, so that to operate both as entrance and exit gates. The system will also contain a bilateral refunding system between the transport operators that will integrate with Metrorex system.

This project is not only a technical and operational need, but it will provide additional amenities for passengers, both in terms of trip titles procurement and the access into the metro network, so that to meet the passengers expectations and international standards.

3.4. International events participation (Congresses, Conferences, Exhibitions etc.)

Since 1994, METROREX S.A. is a full member of the International Association of Public Transport (U.I.T.P.) (during 2003 – 2006, it provided the Vice-presidency of the European Integration Committee). This membership entitles Metrorex S.A to attend the congresses, conferences and other similar events organized by U.I.T.P.

Other events to which the representatives of METROREX S.A. attended in 2015:

Abroad trips:

During the reporting period, based upon the received invitations and supplying contracts concluded by Metrorex S.A., there were made the necessary arrangements for 20 abroad business trips of the staff, in order to participate at:

- Technical visit at the Prague Metro – Czech Republic;
- Kick-off and working meetings for the extension of BM3 project:
  - Technical and factory acceptance inspections of BM3 metro trains components;
  - Quantitative and qualitative acceptances of ATC onboard equipments;
  - Acceptance at the completion works of ATC onboard equipments for the first BM3 metro train;
  - Preliminary acceptances of each BM3 metro train.
- Working reunion with the European Commission representatives;
- Event organized by UITP and co-financed by the European Union with regard the social conditions applied within the European urban public transport companies;
- Factory testing of CTA and CUS equipments and also the washing station equipment;
- Transport Security Expo.

Domestic trips:

During the reporting period, there were made the necessary arrangements for 21 domestic business trips of the Metrorex staff in order to participate at the following events:

- Rescue team training session;
- Conference organized by the Railway Club;
- Technical meetings of homologation;
- SOP-T & LIOP Monitoring Committee reunions.

3.5 Communication and public relations

The activity of communication and public relations of Metrorex has been developed according to the law regarding the free access to the information of public interest, no. 544/2001, according to government decisions, orders of the minister of transport, decisions of the general director. The Communication and Mass-media Office **has ensured the free access to the information of public interest** – to the strategies and projects of the company, through specific actions (press releases, press news, direct correspondence, book releases, interviews, press conferences, campaigns, events, distribution of materials of public interest).

There were **monitored the news flow of the press agencies**, radio and T.V broadcasts - for specific aspects mentioning Metrorex, and were issued and submitted **230 press releases**.

The direct relation was achieved by equidistant communication with the newspapers, TV & radio stations, social media etc. for public information and transparent decision.

Thus, in terms of institutional relation, it was communicated with **286 journalists** and replied in writing to **94 press requirements.**

The information provided to mass-media has appeared in written and audio – visual press with a great impact upon the company's image due to the responses' transparency and promptitude. Furthermore, the administration has informed the public opinion about the activity of the Metrorex, by means of press interviews granted central press publications.

Therefore, there were given **11 interviews** of the senior management.

Also, there were made **51 documentation visit, 9 coverage of Metrorex employees** and **24 informal meetings** organized both at the Metrorex head office and the metro network (stations, Control Traffic Centre, depot, Metrorex library).

In compliance with the Communication Strategy of Metrorex, **the general politics of the company was transposed in terms of public communication** based upon the objectives agreed by the management, and therefore, the public communication represented the expression of the main attributes of Metrorex.

Metrorex has answered in 2015 to a number of 824 petitions, and on the company's webpage, there has been posted, with the consent of the Ministry of Transport, **38 press releases and press notifications.**

The **86 letters of content** addressed to Metrorex for the prompt and competent replies are seen as a **proof of client satisfaction** towards the company's performance. In addition, the control body ASFR-ISF has observed the conformity of the dealing procedures with the politics and objectives of the society which is targeted towards the satisfaction of the client.

Thus, the project "***Metroul Tânăr***" was also carried out this year, enabling Metrorex to continue the presentation of the company's activity and, for interested young people, the opportunities in the underground public transport field, promoting youth in the underground transport, open to all educational projects and the implementation of the responsibility and social sustainability concept (social responsibility representing the company's actions in promoting social interests prior to aspects of purely economic interest; social responsibility actions are those that go beyond the usual obligations of the company, as long as they promote the public interest. Our company has chosen to be socially responsible).

At Metrorex there were developed **129 internships for pupils and students**, to enhance the theoretical knowledge, but also for training and acquiring skills and professional competences so that to be further applied, in accordance with the specialty for which they were trained. The youngsters were guided by 34 specialists from Metrorex.

The project actions were permanently highligthed on "Metroul Tânăr" communication platform, by which Metrorex intends to increase its reputation as a company constantly concerned to promoting competent young people and to strengthen its transport market leading postion. The platform has promoted a range of information and communication activities, debates with students and Metrorex specialists, thematic competitions, meetings with young Metrorex employees. There were posted project activities, such as documentation visits of students, participation of young people to various events organized by the company, documentation activities within the national programme "Şcoala Altfel", participation to fairs, exhibitions and other activities in the field of transport.

It was made the information and publicity for **7 projects to be executed under non-reimbursable external funding** – **Metro Line 5**: Section Râul Doamnei – Eroilor (PS Operă) including Valea Ialomiței; **Metro Line 4**. Extension 2. Section Parc Bazilescu (PS Zarea) – Străuleşti; Improvement of urban public transport services with metro on **Metro Line 2**. Berceni-Pipera; Improvement of urban public transport services with metro on **Metro Line 1-3;** Modernisation of fixed installations on Metro Lines 1, 2, 3 and Connection Link: **Ventilation installations**; Modernisation of fixed installations on Metro Lines 1, 2, 3 and Connection Link: **Access control installations**; Pre-feasibility and Feasibility Study for the construction of Metro Line 4 – Section Gara de Nord – Gara Progresu within the frame of the Swiss-Romanian Cooperation Programme.

For all these projects, there were prepared the following documents: Communications plans, reports, bidding documents, proceedings to estimate the procurement cost, and notes stating the procurement specific procurement conditions.

The information and publicity activity related to 2015 ongoing projects included the preparation and posting on Metrorex website of 15 press releases, mounting five temporary billboards on Metro Line 5 site, in compliance with the requirements of the Management Authority for the Sectoral Operational Programme Transport and the provisions included in the Visual Identity Manual.

During 2015, officials of the European Commission, Ministry of Transports and also groups of journalists visited the sites of the future metro stations.

In order to provide the project information and publicity, **on December 9, 2015, at Valea Ialomiței metro station, it was held a press conference attended by 60 guests who where informed about the status of the works on the future Metro Line 5 metro stations**.

Metrorex initiated, organized and carried out 44 social partnerships, both cultural and educational, which highlighted the importance of the metro in the public eye. All events were accordingly shown in mass-media: 4 news agencies, 10 TV stations, 7 radio stations and over 40 online news sites, forums and personal blogs.

We assure the passengers that Metrorex was and will remain a loyal partner that will define the public transportation through speed, comfort, safety and a sustained effort to adapt to the challenges of the future.

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Chapter 4. Organization and personnel development

The organizational structures comply with the scope of the company's activity and clearly define each position in the Organizational and Operating Rules.

Every position within the organization chart represents the scope of activity of each department and specialized division. They distinctly precise the company's tasks necessary to be performed in the related areas of expertise: operation, revisions-repairs, commercial, informational, planning, accounting, economic-financial, human resources, traffic safety, labour protection and medical services for the employees etc.

The company's organizational assembly is pyramidal built, so that every department and sub-division to have a single operational subordination.

Since the company's organizational structure defines the hierarchical subordination and control levels, it continuously determines the operational relationship between the departments and sub-divisions to meet the final goal: the passengers' satisfaction.

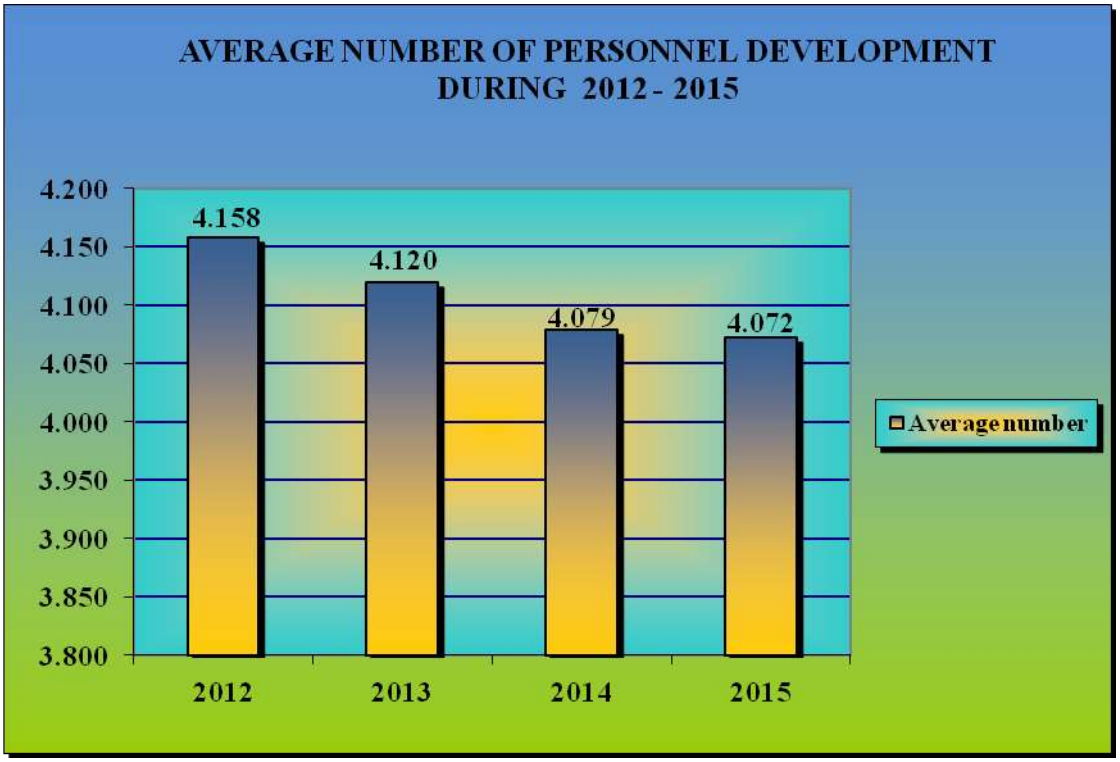
The organization structures which operated in 2015 followed the hereinafter main objectives:

- establishment the functional relationship between departments and sub-divisions;
- organizational structures with simple subordination, so that the information flow to be provided as directly and promptly possible;
- distribution of tasks and specific activities, in compliance with the department or sub-division scope of activity.

The number of personnel at the end of 2015 was of 4.218 employees.

The average number of personnel development during 2012 - 2015

Year	**2012**	**2013**	**2014**	**2015**
Average number	4.158	4.120	4.079	4.072


AVERAGE NUMBER OF PERSONNEL DEVELOPMENT DURING 2012 - 2015
4.200
4.150
4.100
4.050
4.000
3.950
3.900
3.850
3.800
4.158
4.120
4.079
4.072
2012
2013
2014
2015
Average number

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Chapter 5. Operation activity

5.1. Infrastructure

5.1.1. Stations and inter-stations

When the site was chosen, there were taken into account the total number of urban conditions: the concentration of passengers' flows, the peculiarity of public utilities of each area, as well as the real possibilities of execution, avoiding within the construction a major impact on ground traffic.

The inter-stations route generally follows the main streets in town, the tunnels and metro galleries were performed using the technologies known at the time of execution, since the most of the pierced soils could had been included in the category of the "weak" ones, the groundwater sheet being nearly close to the ground's surface (between 2 and 5 m).

The rolling track levels are located at 12,00 m depth, on average, and may vary between 7,80 m and 19,60 m.

The main public areas and stations accesses were dimensioned in order to take over flows over 50.000 passengers per hour and direction.

In order to provide the passengers upright traffic, there are used elevators, fixed stairs and escalators with a difference level between 5,00 and 10,30m.

There were used a diversified range of solutions and finishing materials in accordance with the assembly conception concerning the ambient of each station.

Consequently, the floors are from natural stone (granite, marble), sandstone or mosaic with granite aggregates. There are constantly used the granite steps for the access stairs.

The walls and pillars are plated with travertine or marble and also with ceramic plywood, decorative mortars, enamelled sheet metal elements (*alphatron*), Trespa panels etc.

There are two ways of ceilings treating, correlated with the solutions for structure, lighting installation, ventilation, signalling etc.:

- suspended ceilings made of light panels, metal grates etc.
- apparent plastered ceilings.

Given the age of the suspended ceilings, the company has launched and promoted a safeguarding program with a view to be further modernised.

On inter-stations operate, as technological endowments, ventilation and pumping stations. They permanently keep the necessary conditions for a normal metro operation, by evacuating the waters provided from infiltrations, polluted air and by replacing it with fresh air.

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5.1.2. Installations

The normal and uninterrupted operation of the existing installation in the metro network provides the continuity, railway safety and traffic regularity of trains and, in the same time, provides the passengers full security and comfort. The specific conditions of the metro network generated complex technical problems of a great variety. In order to solve them, there were involved technological engineering and scientific research institutes, technical education institutes and specialized companies of the electronic and mechanical engineering industries in Romania.

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5.1.2.1. Installation in passengers' service

Each station also has:

- general lighting system;
- escalators;
- public address system to warn the passengers in the stations and to make public announcements;
- electronic clocks (exact hour and recording the elapsed time from the last train's operation);
- installations of passengers' dynamic information (info-kiosks, displays with information for passengers, S.O.S balises);
- installations for continuous surveillance and limiting to non dangerous values the electrical voltages of touch and step in the embarking areas;
- installations for warning, signalling and monitoring of fires & intrusions;
- installations for fare collection, passengers control access and automatic vending machines;
- buttons for traction power emergency disconnecting;
- closed circuit television;
- elevators and platforms for vertical transportation;
- it was tested the access control system and trip fare payment using mobile phone, which is to be implemented within the modernisation;
- it was extended the access control system and trip fare payment using contactless bank cards.

The access areas, escalators, entrances and stations' platforms are supervised by the operating personnel, by a closed circuit television system.

5.1.2.2. Ventilation installations

For a normal traffic, the air discharge that has to be circulated on a station – inter-station assembly is of about 300.000 m^3/h.

The ventilation of this assembly is in reverse mode. During the summer the cleaned conventional air is been introduced by the ventilation station from the station and is evacuated, by the inter-station ventilation. During winter, the entrance-exit circuit being inverted, the system's heat clearings are used for warming up the public areas in stations.

During summer, there are provided air conditioning and cleaning installations, so that in stations to be maintained a maximum temperature of +27^{o}C.

It is also provided a ventilation system of the sub-platforms in order to prevent dust particles scattering lifted by the trains' traffic and to take over the warmth cleared up when braking in stations. This system provides the air's suction at the level of rolling track and its evacuation to the inter-stations in the trains' operating direction.

The technical rooms are ventilated by specialized independent systems compared with the functional requirements of the various categories of equipment and devices. These ones also provide the smoke exhausting in case of fires.

Given the age, wear and importance of these installations, Metrorex has launched a major rehabilitation process to be financed under European funds for the first six metro stations commissioned in 1979 (on the route from Timpuri Noi to Semănătoarea, currently named Petrache Poenaru).

5.1.2.3. Sanitary, water supply & sewage and fire extinction installations

The stations are provided with water installation necessary for specific consumption, ventilation air treating, extinction of certain fires and washing technical and public areas. The consumption is provided by two independent sources: the municipal network and own deep water wells, respectively.

In stations and inter-stations there were provided hydrants and fixed installation for extinction with pulverized water in some technical rooms of increased fire danger or difficult access, in order to be supplied the emergency fire-fighting equipments.

The collected waters, as well as the infiltration waters, are evacuated in the municipal sewerage network with a special pumping installation, both in stations and inter-stations.

5.1.2.4. Activity surveillance installations

Every station was equipped with a technical surveillance room, attended by permanent staff, making available a series of endowments providing a global image upon the operational status of installation and conditions in which the surveyed traffic is carried out, such as:

- surveillance monitor of train's traffic, in ATP complex, having 2, 3 or 5 stations;
- telecommunications desk with operative telephony stations on selective calls, local phone lines, automatic telephony stations, transmitter – receiver station for radio communications with the operating trains and the stations sounding installation;
- local dispatching panel for surveillance and control the main installation and equipment: ventilators, water supply plants, pumping stations, escalators, general lighting etc;
- displays of the closed television circuit in station;
- automatic warning station of incipient fires in technical rooms;
- intrusion detection warning station in pay desks and areas containing important values;
- S.O.S. balises on Metro Line 3 and the connecting stations.

All these endowments facilitate taking the best decisions and operative interventions in case of disturbances or failures.

5.1.2.5. Power supply

The electro-energetic installation provides the power supply both for traction and the entire operation activity of metro.

The necessary power supply is provided by the national energetic system, by feeders of 20 and/or (10) kV voltage.

This installation was conceived taking into account the system's generally continuity condition, the traffic's stopping being admissible only when the municipal power supply would totally fall down.

For the situations when the electro-energetically system would become fully non operational, there were provided independent power supply sources. They supply some vital consumers: the stations and tunnels passengers' evacuation lighting, information transmission between Control Traffic Centre and stations, traffic dispatching centre and trains, as well as control devices for the normal activity's resumption when voltage is restarted.

Due to the great territorial dispersion of installation, the imperious need of operatively correlation with the national energetic system when setting up the functional regimes and avoiding the disturbance and damages, there was necessary a centralized coordination and control system. This system has a vital importance in providing the continuity in supply.

For this reason, it operates the Control Traffic Centre, which takes over all these functions on the entire metro network and provides the here below endowments for every line:

- a synoptic panel with automatic display of the operational diagram and a control desk;
- telemechanics equipment and communication lines for information taking over and automatic transmittal from and into the process;
- automatic displays, control and fast recording, brackets for the information exchange with the process computer etc;
- internal telecommunications equipment providing the connection with the national energetic traffic centre.

5.1.2.6. Traffic safety, control and automation

The complex system of equipment and safety & automation installation of passengers metro trains operation was designed for a maximum train speed of 80 km/h.

The system consists of the following sub – systems, according to the fulfilled functions:

- installation for automatic train operation, Westrace type, incorporating the optimised train control by process computers, automatic stopping at platforms and trains speed continuous control (automatic pilot);

- automatic train control system (ATC) including the automatic protection subsystem (ATP) – monitors the trains, send the speed codes from the rolling track (rail) to the onboard equipment, detects the rolling stock presence on the involved area, verifies the racks continuity and the automatic train operation subsystem (ATO) – the train stopping in a specific point by fixed programmable balises, indications about the doors opening side, information for not stopping in a certain station, information about the speed regulation.

- installation for automatic train operation, including the traffic telemechanics installation, vehicle identification and automatic display installation in the control traffic centre of the train number (AVI);

- installation for automatic train protection (safety) including the punctual auto–stop installation (INDUSI) and speed continuous control installation by repeating the signals on board (for BM metro trains), surveillance mechanism (surveillance foot board);

- installation for automatic train operation, including the traffic telemechanics installation, vehicle identification and automatic display installation in the dispatching centre of the train number (AVI), destination and the trains' routes;

- installation for automatic train operation incorporating the optimised train control by process computers, automatic stopping at platforms and, finally, trains speed continuous control (automatic pilot);

- automatic train control system (ATC) including the automatic protection subsystem (ATP) – monitors the trains, send the speed codes from the rolling track (rail) to the onboard equipment, detects the rolling stock presence on the involved area, verifies the racks continuity and the automatic train operation subsystem (ATO) – the train stopping in a specific point by fixed programmable balises, indications about the doors opening side, information for not stopping in a certain station, information about the speed regulation.

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5.1.2.7. Telecommunications

The system provides rapid and safe communications channels, according to the specific operating requirements. It includes:

- own automatic telephone exchange located in the Control Traffic Centre interconnected with the urban automatic telephone exchange in the area, and with the mobile telephony operators;
- telephony installation with selective call within vocal frequency including a station installed in the Control Traffic Centre and secondary stations mounted in metro stations, parking lines and depots;
- a radio – communication system train - dispatcher operating in normal conditions or with selective call in order to provide the communications with the operating trains;
- transmissions are provided on assigned local frequencies;
- in parallel with the radio-communications system, to manage the traffic, it also operates the underground – ground communication system for emergency situations (this system provides the interconnection with entitled authorities such as the Emergency Situations Inspectorate, Metrorex S.A management, Police station etc.).

The system contains a transmitter/receiver station in the central traffic centre, fixed transmitter/receiver stations in metro stations and depots and onboard transmitter/receiver stations.

The personnel performing works in tunnels can also use the system when the metro trains are not into operation or during traffic hours, if the case is strongly justified.

5.1.3. Installations maintenance activity

5.1.3.1 Revisions and repairs activity

To normally maintain into operation these installations, it is provided a planned preventive maintenance system consisting of daily maintenance activities, regular inspections, and daily repairs and overhauling. These works are performed based upon annual services programs, split into monthly working activities issued for each installation type.

These works are periodically performed, in strictly compliance with the manufacturer's instructions mentioned in the equipments users' guide.

In 2015, the installations divisions performed 100% the planned services activities and maintained the installations into normal and safety operation conditions at the technical designed parameters.

5.1.3.2 Failures

Within the analyzed period, the installation operation was troubled by certain failures occurrence or casual damages mainly incurred by technical reasons due to the reduced reliability of some subassemblies or components, many of these installation being produced with the technology of year 1980.

No failures leading to metro trains safety operation incurred, the maintenance personnel promptly intervening in order to remedy the failures.

The completion of the installations modernisation and upgrading programs, and also the commissioning of new installations had led to decreasing of failures and also the intervention periods of time.

5.1.4. Rolling track

For the first metro line "Petrache Poenaru – Timpuri Noi", the rolling track was performed using the classical solution: rail type 49, with K type clip, on wooden sleepers, placed on gravel sand bedding of 25 cm thickness and a 10 mm binder substratum.

Based on the studies performed for the following metro lines, it was generalized the concrete sleeper (biblock) placed on concrete bedding.

There are used flexible pin changes with 100, 190 and 300m rays, as track devices.

In order to increase the comfort and reduce the vibrations of metro lines operation, it was necessary to replace the initial resilient fastening system with a new one.

5.1.5. Lines, Tunnels and Special Constructions maintenance activity

For the rolling track, tunnels and suspended ceilings there were performed and are still performed maintenance and repair works with a view to increase the passengers' comfort conditions and to maintain the metro trains' traffic safety, as follows:

- Current lines maintenance: 83,37 km (simple uncoiled line) on Metro Lines 1 and 3, and 42,075 km (simple uncoiled line) on Metro Lines 2 and 4;
- Rolling track recurrent maintenance: 20,68 km (simple uncoiled line) on Metro Lines 1 and 3, and 17,854 km (simple uncoiled line) on Metro Lines 2 and 4;
- Switches recurrent maintenance: 20/-/- – Metro Lines 1 and 3, and 13/-/2 – Metro Lines 2 and 4;
- Tunnel and gallery maintenance: 81,413 km on Metro Lines 1 and 3, and 53,301 km on Metro Lines 2 and 4;
- Metro stations suspended ceilings and ditches maintenance: 87.125 m^2 on Metro Lines 1 and 3, 47.111 m^2 on Metro Lines 2 and 4.

5.1.6. Labour conditions improvement

In 2015, there were performed the following activities for labour conditions improvement, both in the technical rooms of the metro stations and depots:

- infiltrations cut off;
- simple and washable paintings;
- paintings on wooden and metal surfaces;
- floor cloths layout, PVC carpet, wooden baseboard, wooden panelling, crockery & tiles mounting;
- mock ceilings mounting;
- doors cabins replacement;
- rooms subdivisions using plasterboard;
- sanitation works;
- PAL furniture manufacture;
- metallic grates manufacture, metallic doors repair;
- replacement of the existing metallic carpentry with PVC carpentry (doors + windows) with double pane glass;
- equipped technical rooms with air conditioning units, heaters (11 elements), boilers, ergonomic chairs, visitor chairs, A2 closet, VS3 wardrobe locker, grip vice, work bench, filter cartridges for gas masks.

PHOTO

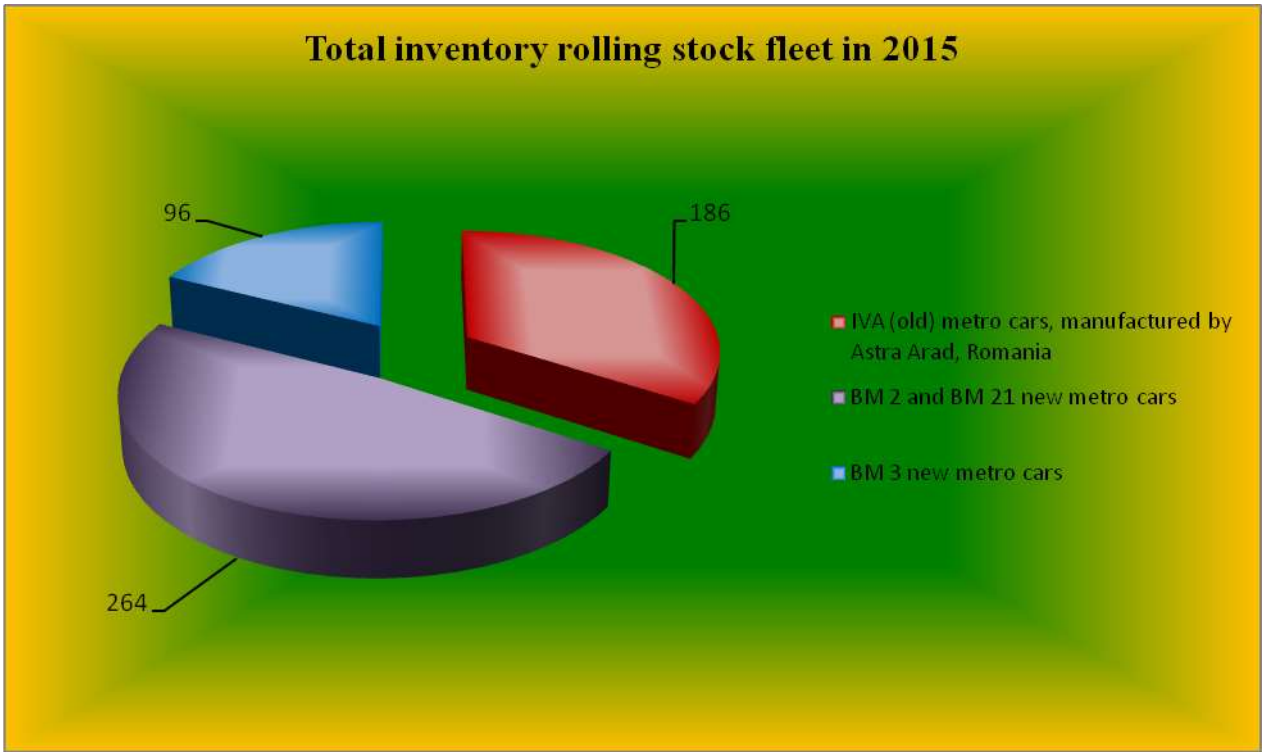
5.2. Rolling stock

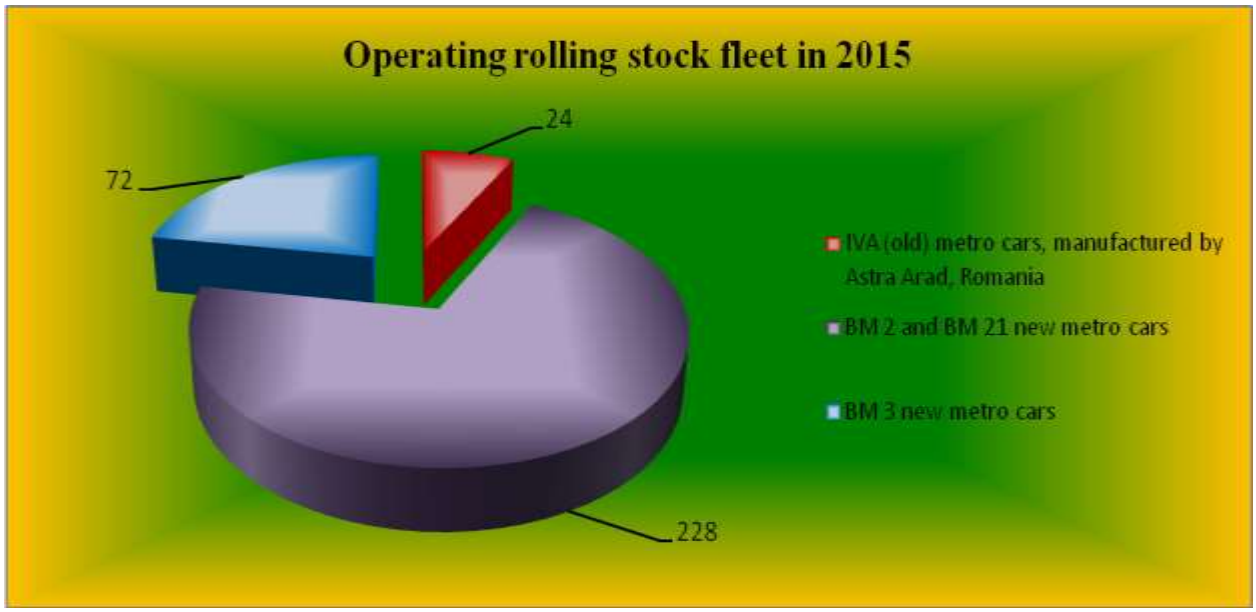
5.2.1. Rolling stock fleet - structure

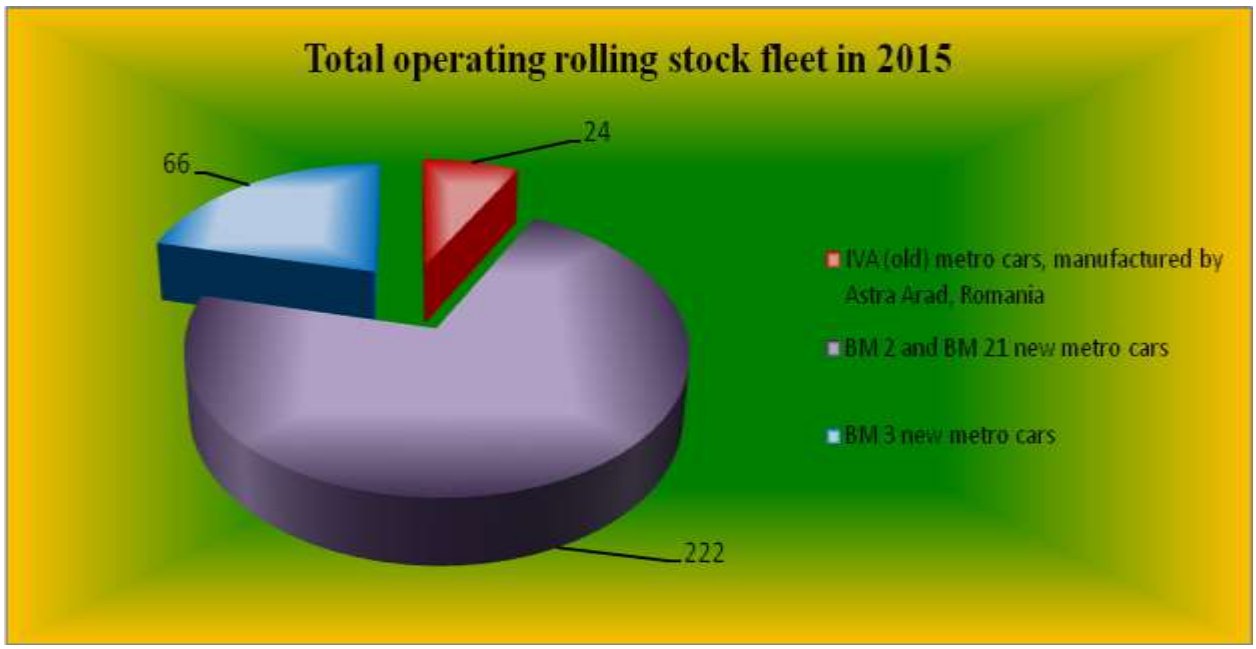
The structure of the rolling stock fleet during 2012 – 2015 is as follows:

Indicators	2012	2013	2014	2015
➢ **Inventory rolling stock fleet, from which:**	**544**	**490**	**546**	**546**
a) IVA (old) metro cars, manufactured by Astra Arad, Romania	280	226	186	186
b) new metro trains generation: - BM 2 and BM21 - BM3 (CAF)	**264** 264 -	**264** 264 -	**360** 264 96	**360** 264 96
➢ **Operating rolling stock fleet, from which:**	**303**	**324**	**306**	**324**
a) IVA (old) metro cars, manufactured by Astra Arad, Romania	80	90	30	24
b) new metro trains generation - BM 2 and BM21 - BM3 (CAF)	**228** 228 -	**234** 234 -	**276** 204 72	**300** 228 72
➢ **Total operating rolling stock fleet, from which:**	**308**	**312**	**300**	**312**
a) IVA (old) metro cars, manufactured by Astra Arad, Romania	80	84	30	24
b) new metro trains generation - BM 2 and BM21 - BM3 (CAF)	**228** 228 -	**228** 228 -	**270** 204 66	**282** 222 66

The rolling stock fleet structure in 2015 is shown below:







5.2.2. Metro trains constructive characteristics

The existing rolling stock fleet at the end of 2015 comprised electric metro trains manufactured by "*Întreprinderea de Vagoane Arad*" (IVA), configured in 2 metro cars units, new BM2 and BM21 metro trains manufactured by Bombardier Transportation Sweden, configured in 6 permanently coupled metro cars, and new BM3 metro trains manufactured by Construcciones y Auxiliar de Ferrocarriles (CAF), configured in 6 permanently coupled metro cars.

5.2.2.1 IVA metro trains of old generation

Technical characteristics of the IVA type metro unit, manufactured by Astra Arad, Romania, (configuration of 2 metro cars)	
Length of unit over couplers	2 *x* 19.000 mm
Maximum width (with closed doors)	3.100 mm
Maximum height from NSS (over pantograph in the lower position	3.590 mm
Floor height from NSS	1.165 mm; ± 10 mm
Gauge	1.432 mm
Tare Weight	2 *x* 36 tons
Seating capacity	34
Standing capacity for 4 passengers/m^2	166
Standing capacity for 8 passengers/ m^2	264
Supply voltage	750 Vcc (-30%, +20%);
Traction power	4 *x* 215 Kw
Driving with starting series – parallel controller and braking with auto-compensatory separate excitation	
Control voltage	110 Vcc ± 20% and 24 Vcc ± 20% ;
Automatic control system for metro unit car starting and braking	SACVAM
Service braking	Electro-dynamic with automatic changing – over on the electro–pneumatic system
Braking when stopped	with spring
Emergency braking	Pneumatic, in addition with the spring braking, except electric brake
Maximum speed	80 Km/h
Commercial speed	36 Km/h

- The IVA carbody is a self – supported structure made of highly alloy steel profiles provided with fixed and hinged windows and four doors on each side of the metro car.
- The metro unit is powered from the third rail, laterally mounted to the rolling track, via some catches mounted on bogie.
- For manoeuvres, in depots and parking areas, the metro car was provided with a pantograph on roof that allows running with a speed of 15 km/h.
- For the communication between the driver and passengers, it was provided an audio installation and for the communication between the driver, operator and traffic centre a radio transmitting/receiving station.
- The IVA type trains, operating on Metro Line 4 – Gara de Nord 2 – 1 Mai, were equipped with automatic protection and operation installation ATP/ATO Dimetronic.

In order to improve the transport conditions, Metrorex and the metro trains' maintenance supplier (ALSTOM Transport) initiated during 2011 a major process for modernisation of 90 cars – 15 IVA metro trains.

Currently, the modernisation works were completed.

PHOTO

5.2.2.2 BM2/BM21 metro trains of new generation

During 2003 - 2004, on Metro Line 2 were commissioned 18 new metro trains type BM2 (Bombardier) manufactured in compliance with the latest technical standards worldwide: traction in alternative current, recuperative brake, air conditioned in driving cabins, intercommunication between metro cars, communication system between driver, passengers and operator, local doors opening system to enter the car etc.

In June 2008, it was supplied the last metro train from a total of 26 new metro trains type BM21 (Bombardier). These trains were included within the scope of supply of the contract for the acquisition of 20 new metro trains, subsequently supplemented with 6 additional metro trains. 22 of these metro trains are in operation on Metro Line 1 + 3, replacing a part of the old rolling stock fleet.

The rest of 4 metro trains type BM21 supplemented the rolling stock fleet on Metro Line 2 with a view to decrease the involved headway.

Subsequently, according to the commissioning schedule, 16 metro trains type BM2/BM21 were gradually replaced by the 16 new metro trains generation type BM3 (CAF).

From the technological point of view, the new BM21 metro train is characterized by the following:

- high reliability;
- decreasing the energy consumption up to 25%;
- decreased maintenance costs;
- increased safety and comfort level for the 1.200 passengers of one metro train;
- the communication between the 6 metro cars is performed via intercommunication corridors (gangway);
- highly improved doors locking systems, as they are equipped with sensors to detect obstacles;
- the metro train can be operated by a single driver;
- latest protection systems: automatic train protection (ATP) and automatic train operation (ATO);
- forced ventilation in passengers' compartment;
- the level of noise is much reduced, compared with the old metro trains' level of noise.

Technical characteristics of the new metro trains generation type BM2 and BM21 (configuration of 6 metro cars)	
Length of unit over couplers	112.610 mm
Maximum width	3.100 mm
Axle load	max. 14 tons
Maximum height from NSS (over the roof)	3.460 mm
Floor height from NSS	1.120 mm
Gauge	1.432 mm
Tare Weight	173,5 t
Seating capacity	216
Standing capacity (4 passengers/m^2)	984
Total capacity – standing seats (8 passengers/ m^2)	1.968
Supply voltage	750 Vcc 3rd rail in traffic and pantograph in depots
Traction motor rating	16 asynchronous motors 125 kW each
Maximum acceleration	1,25 m/s^2
Service deceleration	1,2 m/s^2
Emergency deceleration	1,3 m/s^2
Braking system	Microprocessor controlled, tread brakes
Propulsion system	IGBT converters One inverter for 2 parallel traction motors MITRAC control system 3-phase asynchronous motors
Auxiliary systems	2 static converters with battery charger 400 V AC 50 Hz and 110 V DC 2 compressors, piston type
Maximum speed	80 Km/h

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5.2.2.3 Procurement of new metro trains generation

1. In 2015, there were continued the consulting services for the procurement of 37 new metro trains to equip the Metro Line 5 and to replace the old rolling stock fleet.

2. Also, in 2015, Metrorex signed with Bombardier Transportation Italy the contract no. 12/13.03.2015 for the supplying and commissioning of 8 additional ATC onboard equipments destined to be mounted on the 8 additional BM3 metro trains delivered by CAF Spain within the contract no. 79/24.11.2014.

3. As for the above mentioned contracts, in 2015, the following stages were carried out:

- All 8 BM3 metro trains supplied by CAF within the frame of the contract no. 79/2014 have been preliminary accepted;

- All 8 ATC onboard equipments supplied by Bombardier Transportation Italy within the frame of the contract no. 12/2015 have been accepted in terms of quantity and quality at the place of goods manufacture;

- The first BM3 metro train (1317-2317 Trotuş) of the 8 BM3 metro trains, as of the contract no. 79/2014, arrived in Berceni Depot on December 20, 2015, and the last metro train was about to be put into service at the end of Q2 2016.

4. As for the endowment of Metro Line 5 "Drumul Taberei – Pantelimon" and Metro Line 6 "Gara de Nord – Otopeni Airport" with new metro trains generation, we state the following:

- For Metro Line 5 "Drumul Taberei – Pantelimon", there will be purchased maximum 51 metro trains, from which:

  - 13 metro trains for Section I, Drumul Taberei - Universitate, extension 1: Râul Doamnei - Eroilor (PSS Operă);
  - 13 metro trains for Section II, Universitate - Pantelimon, extension 3: Iancului - Pantelimon;
  - 25 metro trains for Section I - Section II, extension 2: Eroilor - Iancului,

- For Metro Line 6 "Gara de Nord – Otopeni Airport" there will be purchased maximum 12 metro trains.

In order to improve the traffic safety and passengers' comfort conditions, the new metro train is characterised by the here below elements:

- improved passengers handrail system;
- outer speakers for travel information;
- the train direction displayed on the train's side;
- visual warning for doors closing on the train's outer side;
- special area for bicycles;
- special area for wheelchairs;
- yellow press buttons for local doors opening with Braille text;
- additional number of seats (6 per train);
- improved design of passengers seats;
- fluorescent strip at access doors' sill;

- improved passengers access in the metro train by reducing the distance between the car's floor and the platform;

- improved access through gangways by mounting an additional step plate (with skid-proof strip) and divided into 3 parts the first step plate above the bridge slide assembly;

- improved interior design, the indoor displays for passengers information being hidden inside a fake ceiling, located behind a semi-mirrored glass;

- facile access to the devices destined for passengers egress emergency, being mounted at the level of panel surface (on the left post of the door) and at a lower height to become accessible also for small and medium height passengers;

- improved climate in cars and adding inclinable windows in the upper part of the windows (for an additional ventilation, besides the forced ventilation of the room for passengers).

From the technological point of view, the new metro train is characterized by the following:

- a WiFi metro network to notify the failures and submit information for metro trains maintenance;

- disk brake mounted on axle, instead of shoe brake mounted on the wheels' rolling surface;

- the anti-climbers and impact deformation elements are to be mounted on the end trailer in order to take over the shocks in case of frontal collision, without affecting the carbody for relative speeds below 25 km/h;

- running lights with longer operating Xenon bulbs, instead of Halogen bulbs;

- improved Human Machine Interface (HMI) for the train's driver, via a Touch-Screen monitor;

- driver's seat with headrest;

- special place for driver's bag (under the driving panel);

- modified internal and external train design;

- ATC onboard system (automatic train control) mounted in the driver's cabin locker;

- anti-vandalism protection foils on the exterior windows.

In order to improve the safety into operation and the passengers' comfort, the new metro trains will be equipped with automatic train protection and automatic train operation systems (ATP and ATO), compatible with the current new generation infrastructure systems, currently into operation at Metrorex.

Technical characteristics of the new metro train generation type CAF (configuration of 6 cars)	
Length over couplers	113.610 mm
Maximum width	3.200 mm
Axle load	max. 14 tons
Maximum height from NSS (over the roof)	3.550 mm;
Floor height from NSS	1.130 mm;
Gauge	1.432 mm;
Tare weight	172,5 tons
Seating capacity	222
Standing capacity: 4 passengers/m^2	978
Total capacity – standing seats (8 passengers/m^2)	1.956
Supply voltage	750 Vcc 3rd rail in traffic and pantograph in depots
Traction motor rating	16 asynchronous motors of 145 kW each
Maximum acceleration	1,25 m/s^2
Service deceleration	1,24 m/s^2
Emergency deceleration	1,6 m/s^2
Braking system	Microprocessor controlled, disk brakes for service braking, electro-magnetic shoe for emergency/safety braking
Propulsion system	IGBT converters One inverter for 2 parallel traction motors MITRAC control system 3-phase asynchronous motors
Auxiliary systems	2 static converters with battery charger 400 V AC 50 Hz and 110 V DC 2 compressors, piston type
Maximum speed	80 km/h

PHOTO new CAF metro train

5.2.3 Timetables

The following aspects were taken into account when using the timetables in 2015:

- the increased number of transported passengers on the metro network;

- providing the best headway within certain hourly headways when increased passengers flows are recorded (named “peak hour headways”);

- the rolling stock fleet (IVA and BM), technically and safety traffic made available by the maintenance supplier, ALSTOM Transport S.A for the commercial service within the frame of the maintenance services contract;

- timetables complying with the IMF requirements (efficient and optimised costs);

- the existing operating personnel (driver and supporting driver of railway engine & metro) medically and psychologically available.

Therefore, the here below timetables were used:

a) for business days (Monday – Friday):

No.	Metro Line	Timetable	Applicable period	Headway
1.	**Metro Line 1 Republica – Dristor 2**	A1342	05÷09, 12÷16, 19÷23, 26÷30.01.2015 02÷06, 09÷13, 16÷20, 23÷27.02/03, 30,31.03.2015 01÷03, 06÷10, 14÷17, 20÷24, 27÷30.04.2015	Peak hours: 6' Off peak hours: 8'
		A1343	04÷08, 11÷15, 18÷22, 25÷29.05.2015 02÷05, 08÷12, 15÷19, 22÷26, 29,30.06.2015	Peak hours: 6' Off peak hours: 6'
		A1344	01÷03, 06÷10, 13÷17, 20÷24, 27÷31.07.2015 03÷07, 10÷14, 17÷21, 24÷28, 31.08.2015 01÷04, 07÷11.09.2015	Peak hours: 7' Off peak hours: 8'- 9'
		A1343	14÷18, 21÷25, 28÷30.09.2015 01,02, 05÷09, 12÷16, 19÷23, 26÷30.10.2015 02÷06, 09÷13, 16÷20, 23÷26.11.2015	Peak hours: 6' Off peak hours: 9'
	Metro Line 1 Republica – Pantelimon	A1342	05÷09, 12÷16, 19÷23, 26÷30.01.2015 02÷06, 09÷13, 16÷20, 23÷27.02/03, 30,31.03.2015 01÷03, 06÷10, 14÷17, 20÷24, 27÷30.04.2015	Peak hours: 16' Off peak hours: 18'
		A1343	04÷08, 11÷15, 18÷22, 25÷29.05.2015 02÷05, 08÷12, 15÷19, 22÷26, 29,30.06.2015	Peak hours: 18' Off peak hours: 20'
		A1344	01÷03, 06÷10, 13÷17, 20÷24, 27÷31.07.2015 03÷07, 10÷14, 17÷21, 24÷28, 31.08.2015 01÷04, 07÷11.09.2015	Peak hours: 7' Off peak hours: 8'- 9'
		A1343	14÷18, 21÷25, 28÷30.09.2015 01,02, 05÷09, 12÷16, 19÷23, 26÷30.10.2015 02÷06, 09÷13, 16÷20, 23÷26.11.2015	Peak hours: 6' Off peak hours: 9'
	Metro Line 3 Anghel Saligny – Preciziei	A1342	05÷09, 12÷16, 19÷23, 26÷30.01.2015 02÷06, 09÷13, 16÷20, 23÷27.02/03, 30,31.03.2015 01÷03, 06÷10, 14÷17, 20÷24, 27÷30.04.2015	Peak hours: 6' Off peak hours: 8'
		A1343	04÷08, 11÷15, 18÷22, 25÷29.05.2015 02÷05, 08÷12, 15÷19, 22÷26, 29,30.06.2015	Peak hours: 6' Off peak hours: 9'
		A1344	01÷03, 06÷10, 13÷17, 20÷24, 27÷31.07.2015 03÷07, 10÷14, 17÷21, 24÷28, 31.08.2015 01÷04, 07÷11.09.2015	Peak hours: 7' Off peak hours: 8'- 9'
		A1343	14÷18, 21÷25, 28÷30.09.2015 01,02, 05÷09, 12÷16, 19÷23, 26÷30.10.2015 02÷06, 09÷13, 16÷20, 23÷26.11.2015 02÷04, 07÷11, 14÷18, 21÷24, 28÷31.12.2015	Peak hours: 6' Off peak hours: 9'
2.	**Metro Line 2 Berceni – Pipera**	A 249	05÷09, 12÷16, 19÷23, 26÷30.01.2015 02÷06, 09÷13, 16÷20, 23÷27.02/03, 30,31.03.2015 01÷03, 06÷10, 14÷17, 20÷24, 27÷30.04.2015 04÷08, 11÷15, 18÷22, 25÷29.05.2015 02÷05, 08÷12, 15÷19, 22÷26, 29,30.06.2015	Peak hours: 3' Off peak hours: 8'
		A 250	01÷03, 06÷10, 13÷17, 20÷24, 27÷31.07.2015 03÷07, 10÷14, 17÷21, 24÷28, 31.08.2015 01÷04, 07÷11.09.2015 28÷31.12.2015	Peak hours: 4' Off peak hours: 8'- 9'
		A 249	14÷18, 21÷25, 28÷30.09.2015 01,02, 05÷09, 12÷16, 19÷23, 26÷30.10.2015 02÷06, 09÷13, 16÷20, 23÷26.11.2015 02÷04, 07÷11, 14÷18, 21÷24, 28÷31.12.2015	Peak hours: 3' Off peak hours: 8'
3.	**Metro Line 4 Gara de Nord 2 – Parc Bazilescu**	C 407	05÷09, 12÷16, 19÷23, 26÷30.01.2015 02÷06, 09÷13, 16÷20, 23÷27.02/03, 30,31.03.2015 01÷03, 06÷10, 14÷17, 20÷24, 27÷30.04.2015 04÷08, 11÷15, 18÷22, 25÷29.05.2015 02÷05, 08÷12, 15÷19, 22÷26, 29,30.06.2015 01÷03, 06÷10, 13÷17, 20÷24, 27÷31.07.2015 03÷07, 10÷14, 17÷21, 24÷28, 31.08.2015 01÷04, 07÷11, 14÷18, 21÷25, 28÷30.09.2015 01,02, 05÷09, 12÷16, 19÷23, 26÷30.10.2015 02÷06, 09÷13, 16÷20, 23÷26.11.2015 02÷04, 07÷11, 14÷18, 21÷24, 28÷31.12.2015	Peak hours: 8' Off peak hours: 8'-9'

b) for statutory days (Saturday - Sunday and legal holidays)

No.	Metro Line	Timetable	Applicable period	Headway
1.	**Metro Line 1 Republica – Dristor 2**	C 1335	01÷04, 10,11,17,18,24,25,31.01.2015 01,07,08,14,15,21,22,28.02/28,29.03.2015 04÷05, 11÷13, 18,19,25,26.04.2015 01÷03,09,10,16,17,23,24,30,31.05.2015 01,06,07,13,14,20,21,27,28.06.2015 04,05,11,12,18,19,25,26.07.2015 01,02,08,09,15,16,22,23,29,30.08.2015 05,06,12,13,19,20,26,27.09.2015 03÷04,10÷11,17÷18,24÷25,31.10.2015 01,07÷08,14÷15,21÷22,27÷30.11.2015 01,05,06,12÷13,19÷20,25÷26,27.12.2015	Peak hours: 9' Off peak hours: 10'-11'
	Metro Line 1 Republica – Pantelimon	C 1335	01÷04, 10,11,17,18,24,25,31.01.2015 01,07,08,14,15,21,22,28.02/28,29.03.2015 04÷05, 11÷13, 18,19,25,26.04.2015 01÷03,09,10,16,17,23,24,30,31.05.2015 01,06,07,13,14,20,21,27,28.06.2015 04,05,11,12,18,19,25,26.07.2015 01,02,08,09,15,16,22,23,29,30.08.2015 05,06,12,13,19,20,26,27.09.2015 03÷04,10÷11,17÷18,24÷25,31.10.2015 01,07÷08,14÷15,21÷22,27÷30.11.2015 01,05,06,12÷13,19÷20,25÷26,27.12.2015	Peak hours: 18' Off peak hours: 18'
	Metro Line 3 Anghel Saligny – Preciziei	C 1335	01÷04, 10,11,17,18,24,25,31.01.2015 01,07,08,14,15,21,22,28.02/28,29.03.2015 04÷05, 11÷13, 18,19,25,26.04.2015 01÷03,09,10,16,17,23,24,30,31.05.2015 01,06,07,13,14,20,21,27,28.06.2015 04,05,11,12,18,19,25,26.07.2015 01,02,08,09,15,16,22,23,29,30.08.2015 05,06,12,13,19,20,26,27.09.2015 03÷04,10÷11,17÷18,24÷25,31.10.2015 01,07÷08,14÷15,21÷22,27÷30.11.2015 01,05,06,12÷13,19÷20,25÷26,27.12.2015	Peak hours: 9' Off peak hours: 10'-11'
2.	**Metro Line 2 Berceni – Pipera**	C 214	01÷04, 10,11,17,18,24,25,31.01.2015 01,07,08,14,15,21,22,28.02/28,29.03.2015 04÷05, 11÷13, 18,19,25,26.04.2015 01÷03,09,10,16,17,23,24,30,31.05.2015 01,06,07,13,14,20,21,27,28.06.2015 04,05,11,12,18,19,25,26.07.2015 01,02,08,09,15,16,22,23,29,30.08.2015 05,06,12,13,19,20,26,27.09.2015 03÷04,10÷11,17÷18,24÷25,31.10.2015 01,07÷08,14÷15,21÷22,27÷30.11.2015 01,05,06,12÷13,19÷20,25÷26,27.12.2015	Peak hours: 9' Off peak hours: 10'
3.	**Metro Line 4 Gara de Nord 2 – Parc Bazilescu**	C 408	01÷04, 10,11,17,18,24,25,31.01.2015 01,07,08,14,15,21,22,28.02/28,29.03.2015 04÷05, 11÷13, 18,19,25,26.04.2015 01÷03,09,10,16,17,23,24,30,31.05.2015 01,06,07,13,14,20,21,27,28.06.2015 04,05,11,12,18,19,25,26.07.2015 01,02,08,09,15,16,22,23,29,30.08.2015 05,06,12,13,19,20,26,27.09.2015 03÷04,10÷11,17÷18,24÷25,31.10.2015 01,07÷08,14÷15,21÷22,27÷30.11.2015 01,05,06,12÷13,19÷20,25÷26,27.12.2015	Peak hours: 9' Off peak hours: 10'-12'

For 2016, we propose to attract a greater number of passengers by adapting the timetables in order to provide an adequate transport capacity, in compliance with the demand, and best comfort and safety conditions.

5.2.4. Rolling stock fleet maintenance

The patrimony assets of METROREX S.A. consist of 38 IVA metro trains (186 cars), 44 BM new metro trains (264 new cars), 16 new CAF metro trains (96 new cars), 8 Diesel Hydraulic locomotives, 4 railway inspection trolleys, 11 cars for internal use, out of which 2 cars for rapid interventions. In 2002, Metrorex issued a strategy for the company's reorganization, restructuring and upgrading, an important component of this strategy being the outsourcing of some services and activities.

One of the outsourced activities was the rolling stock maintenance, finalized by the signature with **ALSTOM Transport S.A.** of the contract related to the "**Maintenance of railway rolling stock operating in tunnels",** for a period of 15 years, starting from 1st July 2004.

The outsourcing was imposed as an organizational measure within the frame of the development strategy for the metro operating activity and counted on a positive result in respect of increasing the technical and technological performances.

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5.2.5. Rolling stock mileage

Year	2012	2013	2014	2015
Rolling stock mileage (thousand Km)	8.612,67	8.362,24	8.256,43	8.173,95

5.2.6. Energy consumption

The energy consumption development within 2012 - 2015 is shown below:

- MWh -

	Year			
	2012	**2013**	**2014**	**2015**
Electricity, from which:	174.153,40	168.397,36	164.505,24	159.041,84
- for traction	96.384,44	94.042,01	90.677,71	85.587,98
- for installation	77.768,96	74.355,35	73.827,53	73.453,86

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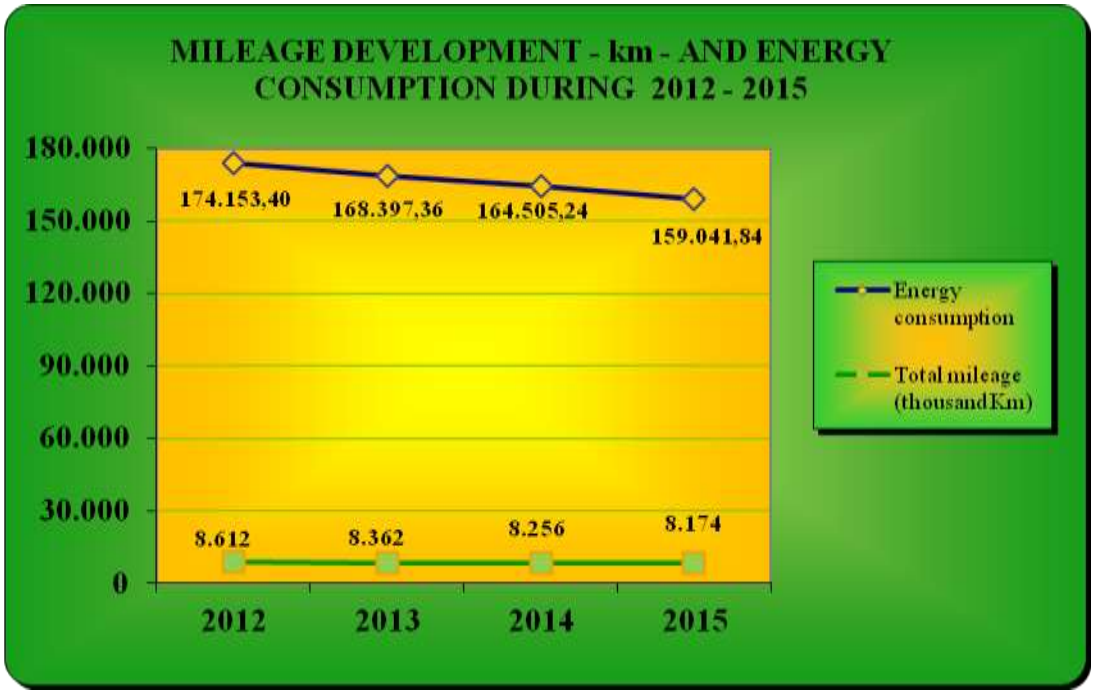

Compared with 2015, the energy consumption decreased in 2014 with around 3,32%, due to metro trains timetables adjustments, by decreasing the headway during peak hours and subsequent increasing the headway during off peak hours.

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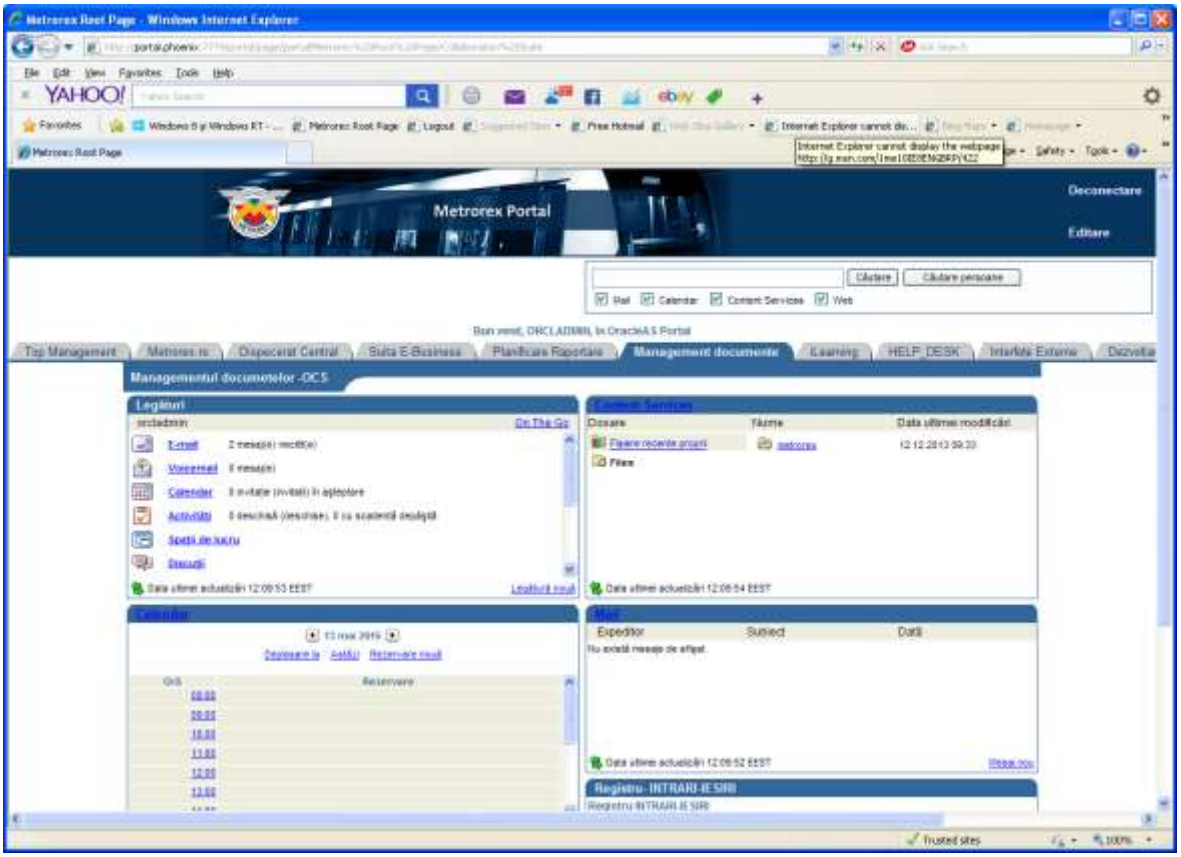
5.3. Activity related to Informatics System in 2015

The activity in the field of informatics mainly envisaged the existing infrastructure modernisation by means of networks extension and configuration, additional equipping with computers, modernisation and procurement sub-systems containing software modules. Technical criteria have been established for the procurement of system and applications software and IT activity at the level of the company have been also reorganized, in compliance with the new organizational structures into force.

In 2015, an important role was played by the development and consolidation of the **Integrated Informatics System** – „***Phoenix***" **(IIS)** with real data provided by the financial – accounting, operation, procurement departments and control traffic centres etc. in order to establish a real managerial informational support.

Since 2013, Metrorex S.A. had implemented an Integrated Informatics System (IIS) consisting of a set of software modules, computers, communication systems and technologies designed to coordinate all resources, information and activities within the company. Integrating the modules functionality and shared data basis, the IIS provides unique information processing and integration from various areas, such as: financial – accounting, sales and distribution, human resources, maintenance etc. The system enables data entry process by means of manual or automatic collection, data storage, unitary processing and information extraction (results) under various forms (real time reports).



In 2015, the IT staff within the Technical and IT Directorate provided and will keep providing technical assistance to the operational users in Metrorex, enabling the interface with the maintenance services provider for any issue reported within the IIS operation, so that to adapt and develop the solution in compliance with the legal and business amendments by means of preparation new reports and forms. Also, defined and managed the users' accounts for the informatics system: unlocked users accounts, arrangements for password change upon the user's request, creating users groups access rights on various application areas.

Another area of expertise within the IT filed is the one related to Network and computers administration which expanded in 2015 subsequent to Integrated Informatics System - Phoenix commissioning. There were monitored the servers, routers and switches within the administrative network of Metrorex, flagged any failures and also there were taken all necessary measures for timely intervention. There were performed ATM and DWDM network configurations/ reconfigurations, configured and managed the e-mail servers, Internet servers, fare collection servers, file-servers partially migrated in a virtual environment, and there were maintained into operation in order to provide the involved services to Metrorex users.

It was maintained the „SITE METROREX" application which can be visited at the web page www.metrorex.ro. This site is currently shown in dynamic version and the passengers may access information in real time with regard to the routes of all four metro lines, including the connections with the ground transport system in each station. By in-sequence changes, the system was designed to operate without errors, prepared to become scalable considering the prospective extensions of stations and metro lines, enabled the system integrated audit, the data management and update could be remotely performed (from a distance).

Since the volume of information required to be posted on the Metrorex website has increased significantly (procurement, investment, payment sheets disposed by Minister's Order or Government Decision, activities regarding the future development of the metro network), the website needed to be reshaped in *html* format. It had been monitored both the regular updating of information and useful messages on site, in *html* format, and were executed corrective maintenance operations of the website by creating current back-ups on the spare server.

There were prepared the monthly reports to highlight the tickets issued and used for the access at Metrorex, using various selection criteria. In 2015, it was created the data basis and data collection modality for the questionnaire form used for the survey on satisfaction of passengers using the metro system, there were prepared special reports concerning on the correlation between various questions and replies to the questionnaire in response to requests for different statistics.

As additional related activities, there were performed a series of design activities, leaflets designing and make up, maps, presentations, promotional materials, anniversary magnetic tickets etc., IT market research activities and training in order to keep update with the latest applicable technology.

Chapter 6. Commercial activity

6.1. Development of transported passengers

Although it covers only 4% of the Bucharest entire public transport network, the metro supplies a higher transport capacity due to its comfort, regularity and safety traffic conditions and provides the transport for about 20% of the total passengers using the Bucharest urban public transportation.

The Bucharest metro is currently transporting over 600.000 passengers/business day, on average, and over 15 million passengers / month.

The number of transported passengers' development within the last four years is shown below:

- Thousand passengers -

	Year			
	2012	**2013**	**2014**	**2015**
Transported passengers	172.555	169.779	173.209	174.830

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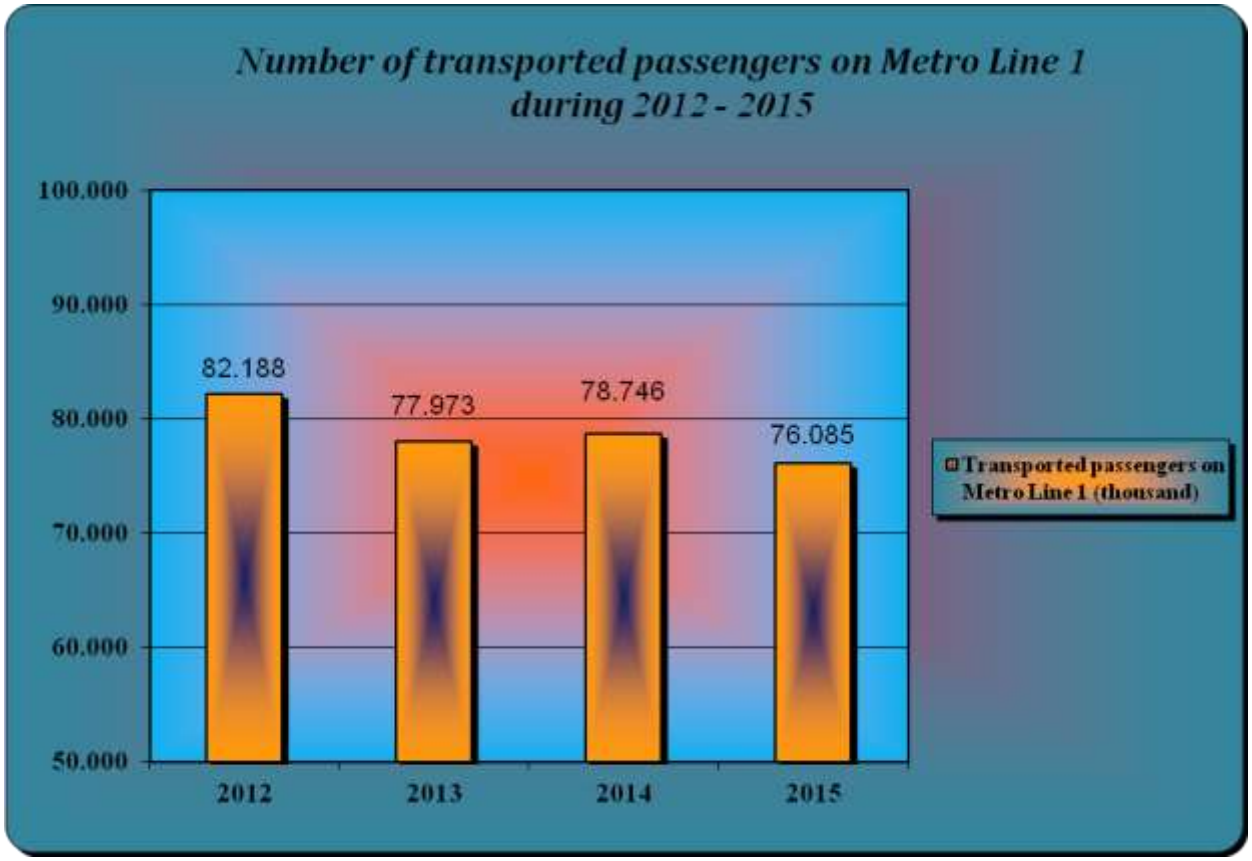
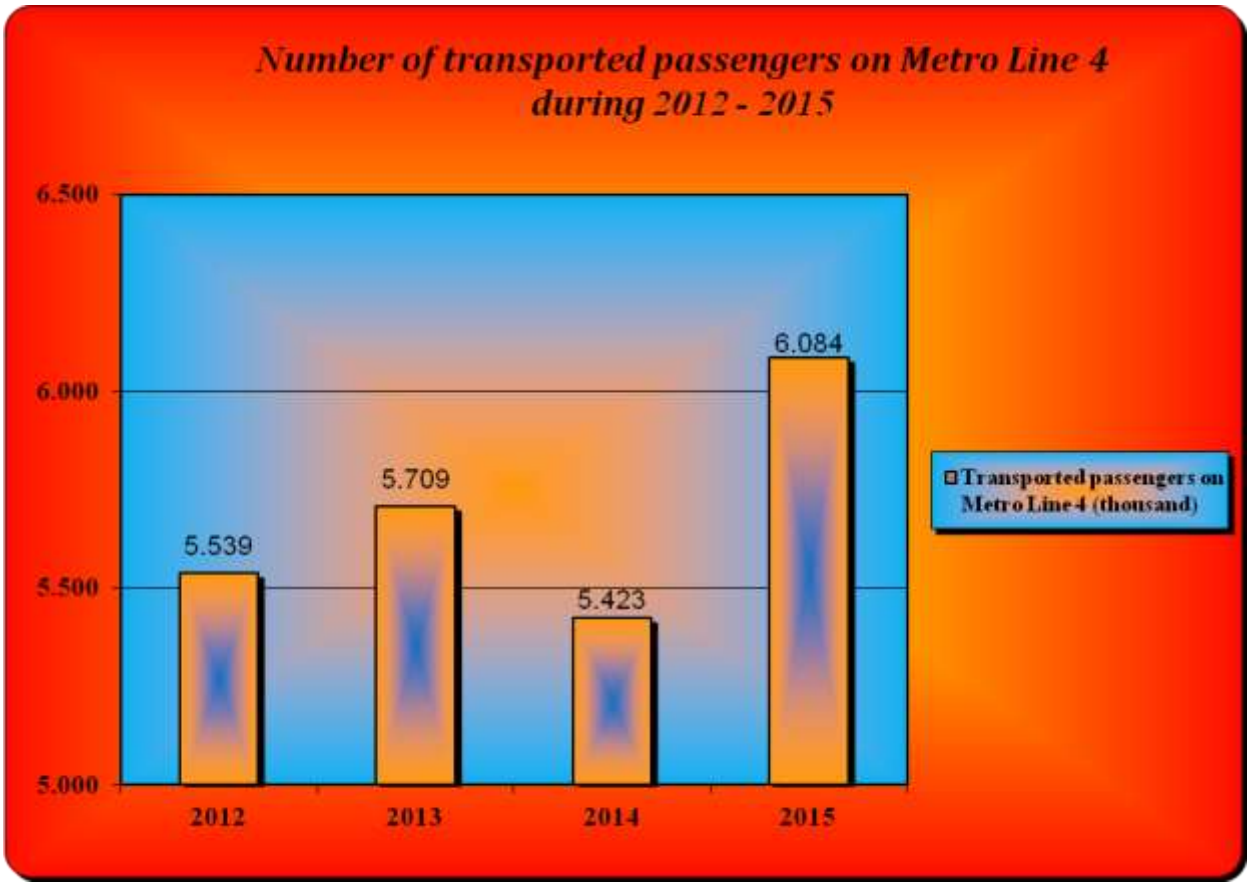
The dynamic of the transported passengers within the last four years, on each of the four metro lines, is shown below:

Year	Total transported passengers	Transported passengers on Metro Line 1	Transported passengers on Metro Line 2	Transported passengers on Metro Line 3	Transported passengers on Metro Line 4
2012	172.555	82.188	61.222	23.606	5.539
2013	169.779	77.973	62.061	24.036	5.709
2014	173.209	78.746	64.650	24.390	5.423
2015	174.830	76.085	67.856	24.805	6.084




Number of transported passengers on Metro Line 2 during 2012 - 2015
70.000
68.000
66.000
64.000
62.000
60.000
58.000
56.000
61.222
62.061
64.650
67.856
2012
2013
2014
2015
Transported passengers on Metro Line 2 (thousand)


Number of transported passengers on Metro Line 3 during 2012 - 2015
25.000
24.000
23.000
22.000
21.000
20.000
23.606
24.036
24.390
24.805
2012
2013
2014
2015
Transported passengers on Metro Line 3 (thousand)



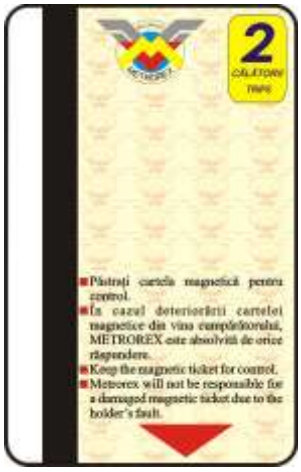
Due to the development of Pipera industrial area, and compared with 2014, it can be noticed that the number of transported passengers increased in 2015 with over 1.600 thousand passengers, especially on Metro Line 2, as in this area there are located numerous multinational companies.

6.2. Trip titles

- two trips ticket
- ten trips ticket
- daily pass
- monthly pass with unlimited trips:
  - fully paid
  - 50% discounted (pupils and students)
- monthly pass with limited trips (62 trips) sold by Metrorex until March 28, 2015:
  - fully paid
  - 50% discounted (pupils and students)
- weekly pass (7 days) with unlimited trips
- pass for passengers under the protection of special laws:
  - with disabilities
  - war veterans, Revolution heroes

- AVC magnetic ticket
- Contactless *PayPass* Bank card
- Mobile phone using NFC (*Near Field Communication*) technology

TRIP TITLES USED WITHIN THE BUCHAREST METRO NETWORK



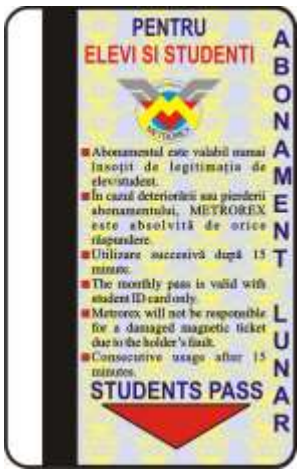
2 trips

10 trips

Daily pass

Weekly pass

Monthly pass



Monthly pass (pupils and students)

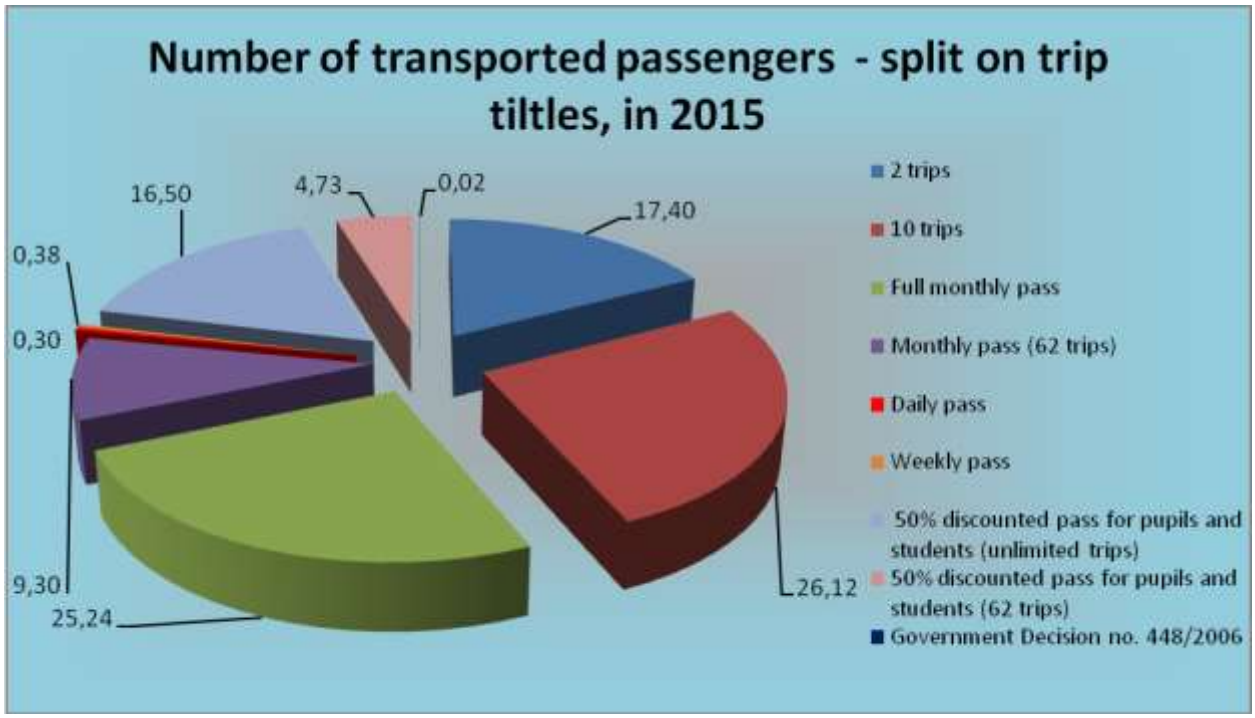
Monthly pass (62 trips)

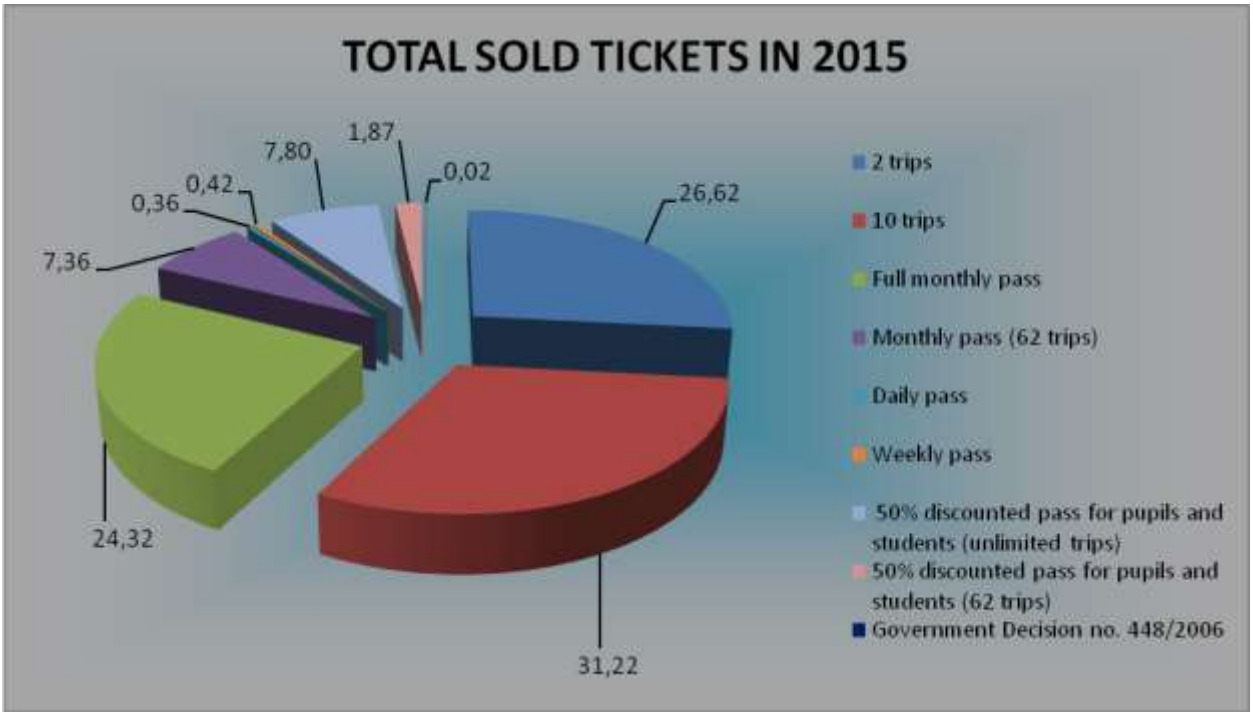
Monthly pass for pupils and students (62 trips)

Starting with the second semester of 2011, there were commissioned 37 automatic vending machines (AVC). The passengers were given the possibility to buy trip titles using coins, bank notes or bank card.

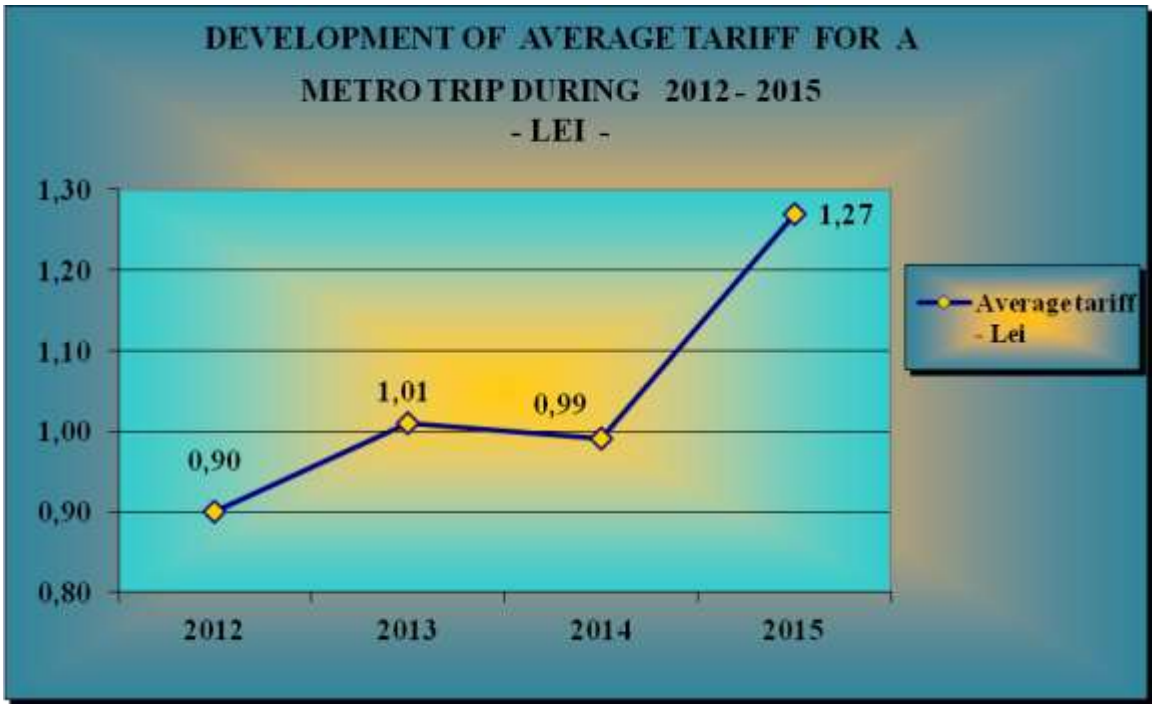
AVC magnetic ticket

For 2015, the diagram of total sold tickets is shown below:





6.3. The development of average tariff for a metro trip



To adopt a more flexible tariff policy complying with the transport demand and offer, it was issued a new decision enabling the metro trip fares adjustments over the inflation index ceiling.

Consequently, the Romanian Government approved the Emergency Decision no. 57/16.06.2011 to recall some items included in the annex to the Government Decision no. 36/2001, enabling the adjustments of the metro fares over the inflation index ceiling.

Starting with March 28th, 2015, the metro trip fares were adjusted according to the Order no. 505/25.03.2015 issued by the Minister of Transports:

- 2 trips ticket …… Lei 5
- 10 trips ticket …….…… Lei 20
- Daily pass…… …… Lei 8

- Monthly pass with unlimited trips:
  - fully paid …….....**.....** Lei 70
  - 50% discounted (pupils and students) **.....** Lei 35

- Weekly pass (7 days) with unlimited trips …….**.....** Lei 25

The annual average tariff for a metro trip is the result of dividing the revenues obtained from the passengers transport activity and the number of transported passengers.

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Chapter 7. Investment activity in 2015

Investment program achievement

The investment program in 2015 was prepared based upon the Bucharest metro network development, upgrading and modernisation strategy, structured on the following main directions:

1. Ongoing activities with a view to complete the investment works under different stages of designing and/or execution;

2. Preparations to initiate new investment objectives for the Bucharest metro network extension and modernisation.

At the beginning of the year, the approved funds for the investment activity in 2015, as per the Budget Law no. 186/2014, were of **1.839.869** thousand Lei in total, structured as here below:

TOTAL, from which:	**1.839.869 thousand Lei**
• Title 55 - Investment of state owned companies	3.000 thousand Lei
• Title 65 - Expenditures related to reimbursable programs	17.646 thousand Lei
• Title 51 - Transfers to finance the metro investment projects	27.291 thousand Lei
• Title 56 - Projects financed under post-accession non-reimbursable funds	1.791.932 thousand Lei

In compliance with the budget adjustments enacted by the Government Decisions no. 20/2015 and no. 47/2015, the investment budget structure of Metrorex, as approved at the end of year, became:

TOTAL, from which:	**1.199.058 thousand Lei**
• Title 55 - Investment of state owned companies, *from which achieved*	3.000 thousand Lei *2.948 thousand Lei*
• Title 65 - Expenditures related to reimbursable programs, *from which achieved*	17.646 thousand Lei *14.646 thousand Lei*
• Title 51 - Transfers to finance the metro investment projects, *from which achieved* (the outstanding balance will be carried over in the program of 2016)	215.816 thousand Lei *70.011 thousand Lei*
• Title 56 - Projects financed under post-accession non-reimbursable funds, *from which achieved*	962.596 thousand Lei *613.177 thousand Lei*

The approved funds for capital expenditures in 2015 were 64,15% achieved, except Title "Transfers to finance the metro investment projects" which was only 32,44% achieved due to the opportunity of using non-reimbursable funds, thus, relieving the state budgetary allocations. These funds were used for the here below mentioned investment objectives:

❖ **Metro Line 4:**

Section Gara de Nord – Străulești – Parc Bazilescu – Lac Străulești

There were performed works to divert the public utilities networks, excavations, diaphragm walls, civil engineering works (bars, slabs, walls, rafts), rooms dividing, architecture, electrical, sanitation and ventilation mounting works both for Străulești Depot, and Laminorului and Străulești metro stations. Both tunnels on the inter-station Laminorului – Străulești and a tunnel on the inter-station Parc Bazilescu (PS Zarea) – Laminorului, were completed, representing 89% of the total length (1350 m of 1520 m). The last tunnel on the inter-station Parc Bazilescu (PS Zarea) – Laminorului, of 170 m length, is scheduled for completion at the end of Q1 2016.

Deadline for commissioning: December 2016.

Section Gara de Nord – Gara Progresu

The project refers to the consulting services procurement for the preparation of:
- Pre-Feasibility Study;
- Feasibility Study;
- Safety Study;
- Multi-modal Mobility Study for Gara de Nord – Gara Progresu extension.

The financing was included in the „Swiss – Romanian Cooperation Programme reduce economic and social disparities within the enlarged European Union", granted by the Swiss Confederation.

The bidding documents for launching the procurement procedure was prepared and currently is under analysis and approval by the State Secretariat for Economic Affairs of the Swiss Confederation (SECO).

❖ **Metro Line 5: Drumul Taberei – Universitate - Pantelimon**
Section Drumul Taberei – Universitate (14 stations, 9 km)
Section Universitate - Pantelimon (13 stations + 1 depot, 8 km)

Works under execution on:

➢ ***Extension Râul Doamnei – Eroilor,*** included in the section Drumul Taberei – Universitate:

In 2015, there were continued the civil engineering works for moulded walls, box walls, excavations, soil consolidations, water discharge, public utility networks declination, stations structure of resistance (bars, ceilings, walls, foundation rafts), hydro-insulations – for all 9 metro stations and there were commenced the finishing works of public and technical areas, as well the mounting works related to commissioning.

- ***Extension Valea Ialomiței station, Depot and Connection Gallery,*** included in the section Universitate – Pantelimon:

In 2015, there were continued the civil engineering works to all three investment objectives (station, depot and connection gallery) and were commenced the finishing and mounting works related to commissioning.

Current execution status: 67%

❖ **Metro Line 6: Bucharest International Airport Rail Access Link Project**

In 2015, there were:

- Obtained the agreement of the Ministry of Transports for the reviewed Feasibility Study, option with 9 stations (from which 2 stations to be subsequently developed) and 9 metro trains;
- Completed the technical documents (Preliminary Technical Designs) related to the option with 9 stations (from which 2 stations to be subsequently developed) and 9 metro trains, for the here below works packages:
  - Architecture, electro mechanic and telecommunications;
  - Rolling stock and signalling system.
- Completed the bidding documents related to the here below works:
  - Architecture, electro mechanic and telecommunications;
  - Rolling stock and signalling system.

❖ **Procurement of new metro trains**

In 2015, there were performed the factory acceptance tests for the 8 metro trains, and subsequently delivered to Metrorex S.A. to start the burn-in tests for commissioning.

The effective commissioning of these metro trains shall start in March 2016, for Train set no. 1 and shall be completed in June 2016, for Train set 8.

There were also continued the consulting services for the procurement of new metro trains.

❖ **Modernisation of installations on Metro Lines 1, 2, 3 and connection link**

There were obtained external non-reimbursable funds for the here below projects within the frame of this investment objective:

A. Access Control Installations

The project is related to the modernisation of the access control installations for 41 metro stations of the Bucharest metro network.

In 2015, there were carried out the procurement procedures, completed with the signature of the contract no. 78/2015 for works execution and the contract no. 73/2015 for information and publicity services.

Also, it was launched the public procurement procedure for consulting services, estimated to be completed at the end of February 2016.

In 2016 there will be performed the execution works.

Deadline for investment completion: end of 2016.

B. Ventilation installations

The project is related to the modernisation of the Bucharest metro network ventilation installations, on the extension Petrache Poenaru – Timpuri Noi – 6 stations and 5 inter-stations.

In 2015, there were carried out the procurement procedures, completed with the signature of the contract no. 22/2015 for works execution and the contract no. 75/2015 for information and publicity services.

In 2015, there were performed dismantling works of the ventilation piping systems, noise dampers, soundproofing, CUS and pumping stations, as well as dismantling works of the reinforced concrete bases within the six metro stations. There were also executed cleaning works, plasters and paintings repairs and readjustments, masonry decommissioning, lay flat blankets casting and epoxydic dyeing. In the same time, there were executed mounting works of ventilation piping, exhausters, ventilation grids, sound-absorbent panels, noise dampers, cables routes, lamps, monorail beams, refrigerating route and indoor and outdoor units. The project is to be financed from the stage budget and structural funds, under Sectoral Operation Programme-Transports (SOP-T) and Large Infrastructure Operational Programme (LIOP).

Current works execution status: 43%.

Deadline for investment completion: end of 2016.

As for the project related to ***„Improvement of metro urban public transport services on Metro Line 2 Berceni – Pipera”,*** there were obtained non-reimbursable external for the here below mentioned investment objectives:

- **Metro Line 2 – Berceni – Pipera – New entrance at Tineretului metro station**

In 2015, it was launched the procurement procedure related to the works execution of a new entrance at Tineretului metro station.

The procedure is about to be completed at the beginning of 2016, the deadline for works completion being the end of 2016 and the financing provided under non-reimbursable European funds.

- **<u>Modernisation of installations on Metro Lines 1, 2, 3 and connection link</u>**

Rolling track on Metro Line 2 – Berceni - Pipera.

In 2015, it was prepared the technical documentation for the rolling track and in 2016, it will be carried out the procurement procedure for works and afterwards commenced the works execution.

Chapter 8. Financial data in 2015

8.1. Share capital

In December 2015, the share capital increased from Lei 20.177.587,50 to Lei 75.177.587,50 by increasing the number of nominal shares of 2,5 lei/share from 8.071.035 shares to 30.071.035 shares, further the allocation from the state budget of Lei 55.000.000, in compliance with the Government Emergency Decision no. 47/29.10.2015 for state budget adjustment in 2015.

The Ministry of Transports is the sole shareholder with a shareholding of 100%.

8.2. Revenues development

The revenues of METROREX S.A. have the following sources:

- Fare box revenues (passengers transport)
- Revenues from state budget subsidies for operating activity for turnover:

  - Total subsidies for passengers' transport with metro, out of which:
    - Current operation activity;
    - Rolling stock maintenance, as per the contract concluded with ALSTOM;

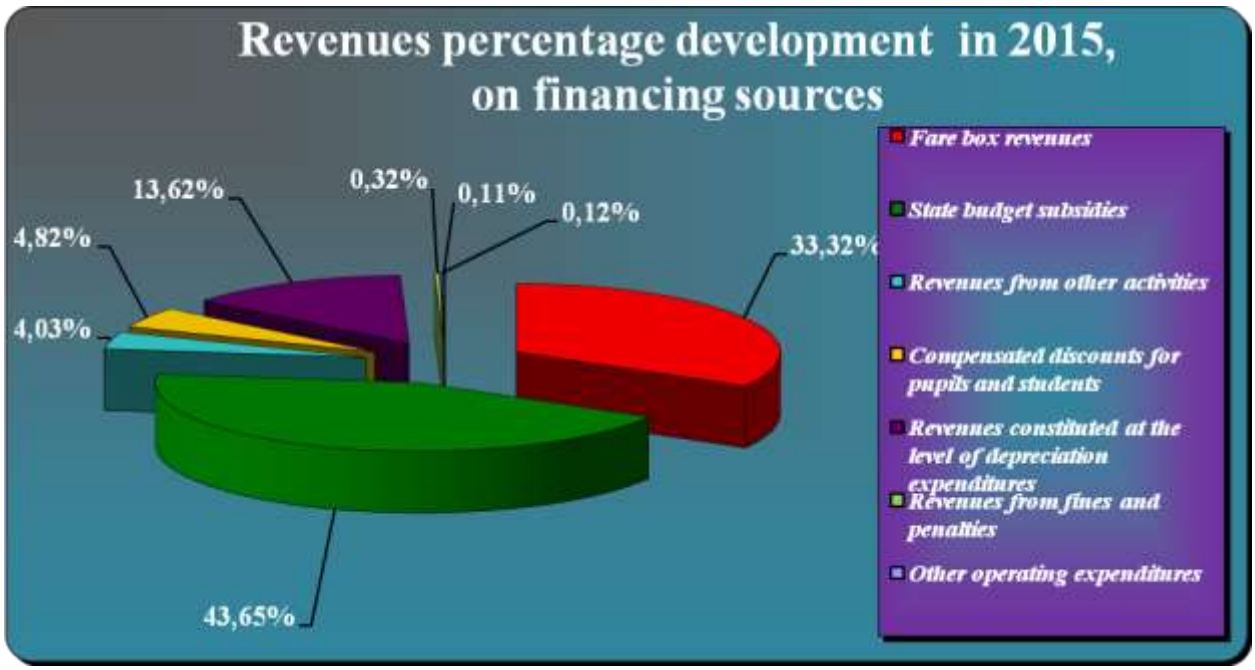
- Revenues from other activities, out of which:
  - Revenues from commercial activities, association contracts, room or land rentals, advertisement etc.

- Revenues from other sources, out of which:
  - revenues from operating subsidies (50% discounts granted to pupils and students, 100% discount granted to Revolution heroes and war veterans);
  - revenues from investments subsidies, constituted at the level of expenditures with depreciation for those investments objectives having as financing source budgetary allocations or loans guaranteed by the state, as per the Minister's of Public Finances Order no. 3.055/2009 and Law no. 259/2007 that modifies and amends the Accounting Law no. 82/1991;
  - revenues from fines and penalties;
  - other operating revenues (recovery, manufacture, assets selling).

- Financial revenues

The revenues pattern during 2012 – 2015 is shown in the table below:

	Thousand Lei			
Indicators	**2012**	**2013**	**2014**	**2015**
0	*1*	*2*	*3*	*4*
I. *Total revenues (1+2), from which:*	**613.926,70**	**604.935,18**	**656.015,52**	**663.796,04**
1. Total revenues from operation (a+b+c+d), from which*:*	**612.403,09**	**604.044,26**	**655.490,05**	**663.091,25**
a) Fare box revenues	154.613,96	171.569,91	172.270,42	221.179,04
b) Revenues from operating subsidies, as per the turnover (b1 + b2), from which:	**349.000,00**	**328.138,00**	**369.007,06**	**289.778,94**
b 1) current operation activity	206.353,61	235.579,36	261.779,05	150.770,43
b 2) rolling stock maintenance contract concluded with ALSTOM (current year)	142.646,39	92.558,64	107.228,01	139.008,51
c) Revenues from other activities (revenues from commercial activities, association contracts, rooms or land rentals, publicity etc.)	33.842,30	26.874,69	27.792,08	26.774,25
d) Other revenues, total from which:	74.946,83	77.461,66	86.420,49	125.359,02
- Revenues from operating subsidies (50% compensation of discounts granted to pupils and students, 100% compensation of discounts granted to Revolution heroes and war veterans)	19.023,98	26.864,02	24.870,35	32.019,40
- Revenues from investments subsidies, constituted at the level of expenditures with depreciation for those investments objectives having as financing source budgetary allocations or loans guaranteed by the state, as per the Minister's of Public Finances Order no. 1802/2014 and Law no. 259/2007 to modify and amend the Accounting Law no. 82/1991	52.798,30	49.862,08	57.892,81	90.395,14
- Revenues from fines and penalties	1.058,62	261,80	3.092,65	2.123,91
- Other operating revenues (recovery, manufacture, assets selling)	2.065,93	473,76	564,68	820,57
2. Financial revenues	**1.523,61**	**890,92**	**525,47**	**704,80**



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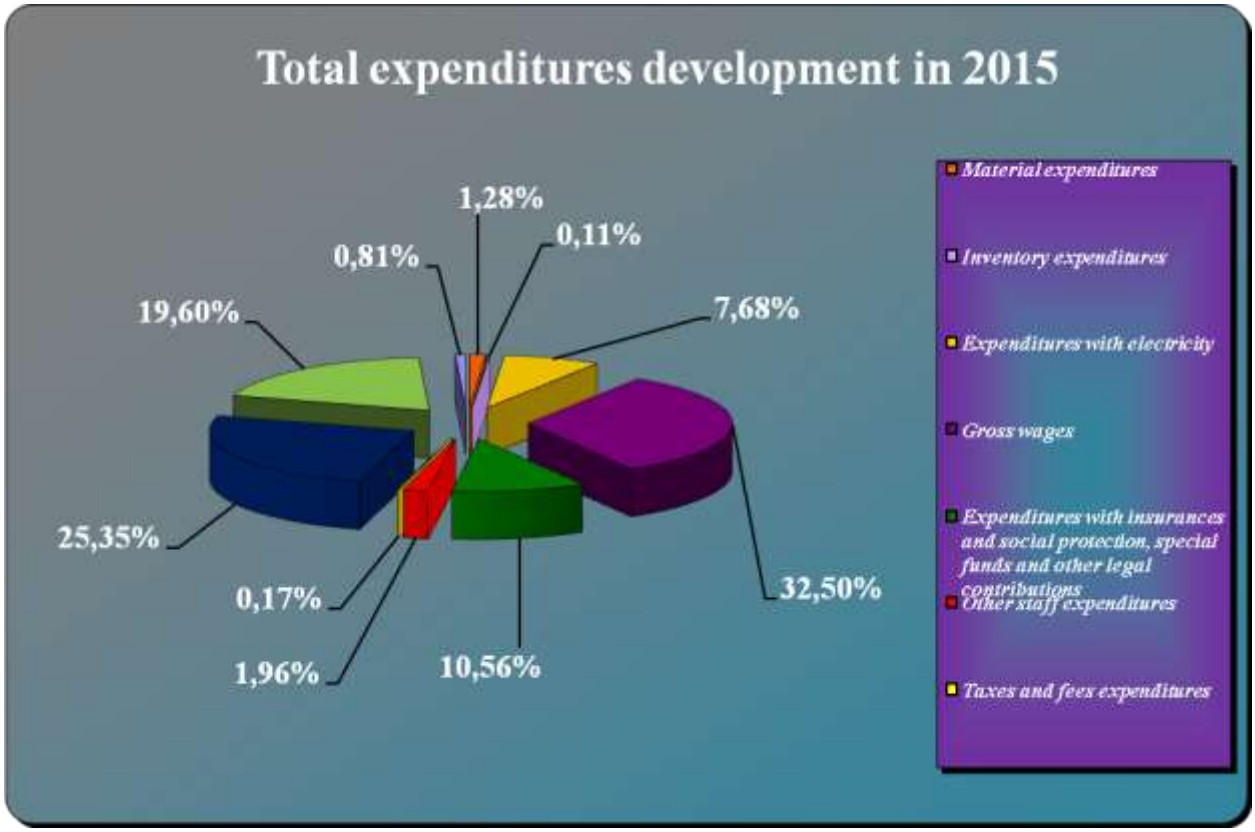
8.3 Expenditures development

The expenditures pattern is the following:

- Material expenditures, from which:
  - Spares expenditures
  - Fuel expenditures
- Inventory expenditures
- Power supply, heating and water expenditures
- Staff expenditures, from which:
  - Gross wages
  - Expenditures related to insurances and social protection, special funds and other legal obligations
  - Other staff expenditures (lunch tickets, social and cultural expenses, other related expenses as per the Collective Labor Contract)
- Taxes and fees expenditures
- Expenditures related to the third parties services, from which:
  - Rolling stock repairs, as per the maintenance services contract signed with Alstom
- Other expenditures, from which:
  - Depreciation
- Financial expenditures.

The expenditures pattern during 2012 - 2015 is shown below:

	Thousand Lei			
Indicators	**2012**	**2013**	**2014**	**2015**
0	***1***	***2***	***3***	***4***
Total expenditures and funds usage (I+II), from which:	**656.228,77**	**669.394,18**	**656.015,52**	**663.796,04**
I. Total expenditures (1+2), from which:	**644.266,45**	**657.053,99**	**647.968,66**	**658.448,86**
a) Material expenditures, from which:	7.270,69	7.096,97	7.358,39	8.513,18
- spares expenditures	2.391,70	2.411,64	2.900,76	2.553,37
- fuel expenditures	360,16	350,22	351,64	312,05
b) Inventory expenditures	1.398,25	1.358,83	926,68	725,28
c) Power supply, heating and water expenditures	65.266,93	61.883,07	56.150,85	50.989,09
d) Staff expenditures, from which:	293.673,32	290.420,78	294.708,47	298.793,68
- *Gross wages*	204.213,50	202.489,61	207.589,20	215.726,02
- *Expenditures related to insurances and social protection, special funds and other legal obligations*	76.746,33	75.854,29	75.013,39	70.088,41
- *Other staff expenditures (lunch tickets, social and cultural expenses, other related expenses as per the Collective Labor Contract)*	12.713,49	12.076,88	12.105,88	12.979,25
e) Taxes and fees expenditures	1.185,79	1.089,13	8.021,68	1.102,66
f) Expenditures related to the third parties services, from which:	189.991,06	178.612,75	171.690,75	168.239,74
- Rolling stock repairs, according to maintenance contract signed with ALSTOM	155.043,36	145.557,35	149.028,75	142.334,84
g) Other expenditures, from which:	85.480,41	116.592,46	109.111,84	130.085,22
- *depreciation*	84.098,97	95.697,13	98.236,44	130.076,15
2. Financial expenditures	**11.962,32**	**12.340,19**	**8.046,86**	**5.347,17**



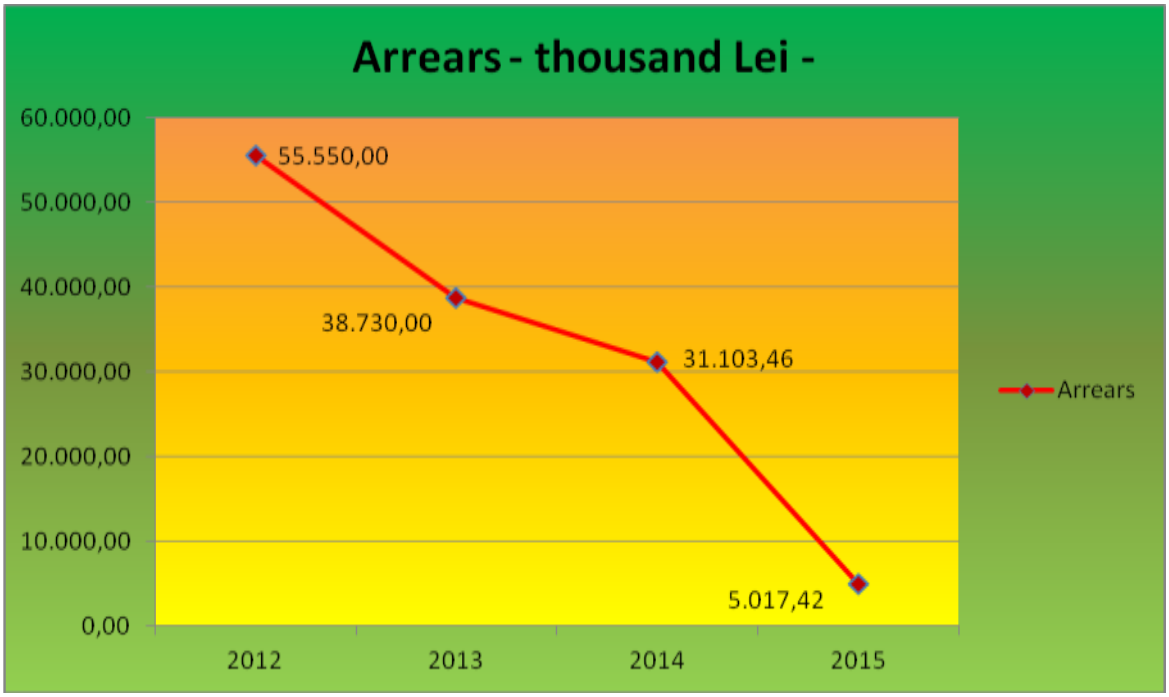
In 2015, the company ended the financial year with a profit of **Lei 29.362.941,55**. Since Metrorex S.A. provides transport services on the underground and ground railway network, under safety traffic conditions, with a view to satisfy the public interest, and according to art. 5 of the Government Decision no. 482/1999 **receive money transfers from the state budget, as subsidies for operation,** highlighted in 7411 account as difference between own fare box revenues and total expenditures, the **resulted profit had been returned to the state budget by diminishing the revenues from operation subsidies related to net turnover**, and thus, the **registered financial year result for 2015 was 0.**

8.4. Arrears and accounts receivable development

The arrears registered at the end of 2015 were of 5.017,42 thousand Lei, mainly representing the equivalent amount of the services invoiced by the investment suppliers, for which the company has not received the necessary funds for their payment until the end of the year.

- thousand Lei -

	2012	2013	2014	2015
Arrears	55.550,00	38.730,00	31.103,46	5.017,42



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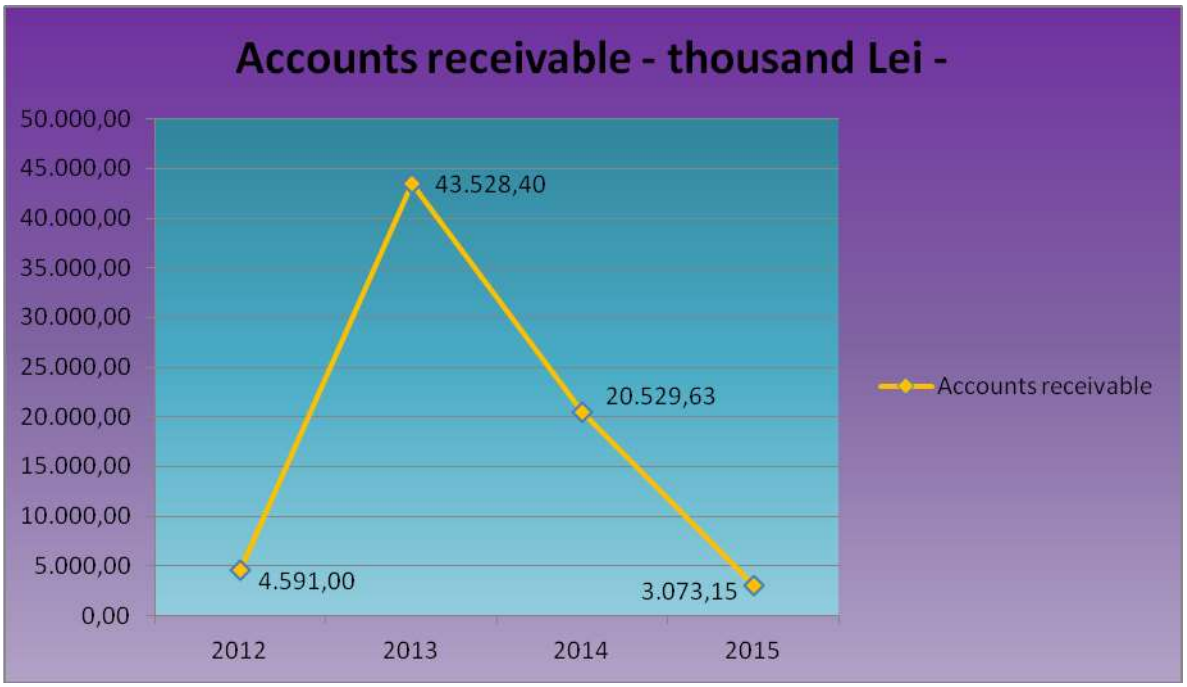
The accounts receivable at the end of 2015 were of 3.073,15 thousand Lei, representing sums to be recovered from the state budget in amount of 2.131,73 thousand Lei and issued and not cashed invoices for utilities, in amount of 941,42 thousand Lei.

- thousand Lei -

	2012	2013	2014	2015
Accounts receivable	4.591,00	43.528,40	20.529,63	3.073,15



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8.5. External audit report upon the financial status

In the auditors' opinion, the financial statements of the company fairly present, in all material aspects, the financial position on December 31, 2015 and the financial performance and cash flows for the financial exercise ended at that date, in accordance with the Order of the Minister of Public Finance no. 1802/2014 for the approval of accounting regulations on the annual individual and consolidated financial statements, with subsequent amendments.

The following relevant aspects were ascertained:

a) The company's activity is dependent to a very large extent of the involvement of the Romanian State with regard to granting state budget allocations for the operation and investment activity. Considering the social public service of urban public transport by metro (as per the Government decision no. 482/1999 for the establishment of the company), it is not expected that in the foreseeable future the Romanian State to discontinue the allocations of these grants.

b) The company has launched a range of ongoing investment objectives, currently under various stages of execution. The company analyzes the possibility and opportunity of completing the involved investment objectives, as well as any potential capitalization, if they are no longer useful fro the company. The effects of any decision to cease (abandon) these investment objectives were not quantified at the financial statements' issuing date.

Chapter 9. Bucharest metro global development and modernization strategy

Between 2007 and 2008, Metrorex S.A promoted and approved at the level of the Ministry of Transports the "*Global Development and Modernisation Strategy for 2008 – 2030*".

To issue the metro development and modernization strategy, it was initiated from the identification of certain modalities to increase the metro transport system contribution in Bucharest taking into account the expenditures diminishing and the performances increasing within the involved public transport specific conditions.

The transports strategy envisages the public transport prioritization, simultaneously with its development and modernisation components.

Therefore, the strategy to be followed for Bucharest metro network modernisation and development envisage the here below main directions:

- **Improvement of the overall organizational system;**
- **Enacting of certain institutional measures with a view to co-ordinate the underground and ground public transport under all aspects;**
- **Development of certain investments programs to allow the Bucharest metro network development and modernisation.**

9.1. *Organization system improvement*

Improvement of the entire organizational system, especially by:

- Increasing the underground public transport attractiveness;
- Quality increasing and underground public transport services diversification;
- Maintenance services improvement.

9.2. *Institutional measures*

The Bucharest metro global development, modernization and reliability strategy is based upon organizational measures at the company's level and measures adopted at governmental level.

One of the most important institutional measures seeks to better co-ordinate the public transport in Bucharest and the contiguous areas.

Under these circumstances, by the Government Ordinance no. 21/31.08.2011, it was created and established the Bucharest Metropolitan Transport Authority, ordinance subsequently approved by Law no. 8/06.01.2012. The Government Decision no. 1.204/06.12.2011 approved the rules of organization and operation of the Bucharest Metropolitan Transport Authority so that to co-ordinate all aspects of the urban ground and underground public transport in Bucharest and contiguous area.

The advantages of establishing and operating such a decisional body are multiple and are mainly referred to:

- Co-ordination of development programs and providing the involved complementarities of the urban and sub-urban transport systems;
- Allocation of public funds for investments in order to avoid parallel operation at an unsatisfactory productivity level of all different transport modes and/or services for transport;
- Fare collection integration and attractive tariff policy application with a view to increase the public transport efficiency;
- Coherent administration of the existing endowments based upon an integrated transport master plan including the transport offer in line with the passengers transport demand (proper routes, common stations, and easy links to reach all the city's main interest points).

The International Bank for Reconstruction and Development (I.B.R.D.) financed the Transport Restructuring Project consisting of the herein below components:

- Component A – Roads Sub-sector
- Component B – Railway Sub-sector
- Component C – Urban transport Sub-sector

PHOTO

9.3. *Investment programs*

The Bucharest metro global development and modernisation strategy was issued starting from the identification of certain modalities to increase the contribution of the metro transportation to the Bucharest public transport modernisation.

The main objectives, on short, medium and long term are structured, as detailed below:

❖ **Metro network development**

1. Metro Line 5: Drumul Taberei – Pantelimon

Revised objective Metro Line 5. Drumul Taberei - Pantelimon shall have the here below indicators:

- Estimated cost: Euro 1.525 million (VAT included)
- Total length: 16,2 km
- Total number of metro stations: 22
- Number of depots: 2

At the end of 2015, the project was included in the **Urban Mobility Plan for Sustainable Development Bucharest – Ilfov**, as a condition to be financed from non-reimbursable external funds under the Large Infrastructure Operational Programme (LIOP 2014-2020).

Thus, as per the stages of the financing under Urban Mobility Plan for Sustainable Development Bucharest – Ilfov, the deadlines for commissioning are as follows:

1. Extension Râul Doamnei – Eroilor: 2017
2. Extension Eroilor – Iancului: 2023
3. Extension Iancului – Pantelimon: 2030

In 2016, it will be launched the implementation of the extension Eroilor – Piața Iancului (6 stations, 4,5 km).

Actions: design (procurement procedure for designing services, contract signature and technical documentation preparation).

Project cost: Lei 3.361,6 million.

Necessary and allocated amount in 2016: Lei 22,12 million.

Actions to be undertaken in order to obtain the financing for:

Approval of the Government Decision containing the technical and financial indicators to consolidate the section Drumul Taberei - Universitate with the Section Universitate - Pantelimon;

Project approval within the Urban Mobility Plan for Sustainable Development Bucharest – Ilfov;

Preparation and approval by Government Decision of the Plan for Metro Infrastructure Development;

Preparation and submission the financing application under the non-reimbursable external funding.

2. Metro Line 6. *Bucharest International Airport Rail Access Link Project*

It will provide the connection of the metro network with the Bucharest International Airport. This metro line will serve important areas of interest such exhibitions, business centres, leisure & supermarkets, residential real estates that create a corridor between the downtown of Bucharest and the Airports surrounding the city, revitalizing the activities and stimulating development of the north and residential areas between Baneasa and Otopeni. By the construction of this metro line, it will be created a rapid railway link between other two, vital for the economy, transport modes: railway and air flight. By the extension of the Metro Line 4, from Gara de Nord to Gara Progresu, it will be created the biggest and the most important metro line on the city's north to south diameter, in order to make the connection between the two main airports: Bucharest International Airport and Băneasa Airport with Băneasa, Basarab, Gara de Nord and Gara Progresu railway stations, and subsequently, the interconnection with the ground transportation.

At the end of 2015, the project was included in the **Urban Mobility Plan for Sustainable Development Bucharest – Ilfov**, as a condition to be financed from non-reimbursable external funds under the Large Infrastructure Operational Programme (LIOP 2014-2020).

Thus, as per the stages of the financing under Urban Mobility Plan for Sustainable Development Bucharest – Ilfov, the deadline for commissioning is 2021.

- Execution period: 7 years
- Estimated commissioning: **2021**
- Total length: 14 km
- Number of stations: 12 (as per the agreement of the Ministry of Transports)
- Estimated cost: Euro 1.055 million + VAT

Actions to be undertaken in 2016:

- Approval by Government Decision of the technical and financial indicators for the option with 12 stations and 12 metro trains;
- Project approval within the Urban Mobility Plan for Sustainable Development Bucharest – Ilfov;
- Preparation and approval by Government Decision of the Plan for Metro Infrastructure Development;

- Preparation and submission the financing application under the non-reimbursable external funding.

3. Metro Line 4: Lac Străuleşti – Gara de Nord - Gara Progresu

Section from Laminorului to Lac Străuleşti

Estimated commissioning:	**2016**
Total length:	2,10 km
Number of stations:	2, including depot
Estimated cost:	Euro 150 million (VAT included)

The line represents an extension of Line 4, added with a view to facilitate the connection with the National Road DN1A, in an area where it will be possible to be located a Park & Ride.

Section from Gara de Nord to Gara Progresu

Execution period:	***subject to financing***
Total length:	15 km
Number of stations:	20
Estimated cost:	Euro 1.008 million (VAT included)

Radial metro line that will connect two of the main railway stations: Gara de Nord and Gara Progresu with the Bucharest International airports: Otopeni and Băneasa, which will provide the connection with all existing metro lines in operation and future metro lines.

The financing is included in the Swiss – Romanian Cooperation Programme to reduce economic and social disparities within the enlarged European Union, with a budget of 44.767 thousand Lei.

Necessary amount for 2016: Lei 6 million; Allocated amount: Lei 6 million;

In 2016, there will be launched the procurement procedure of designing services for the Pre-Feasibility Study and Feasibility Study and the effective commencement of these services.

4. Metro Line 7: Voluntari – Bragadiru

Execution period:	***subject to financing***
Total length:	around 25 km
Number of stations:	30
Depot:	1

This metro line will be executed in order to increase the passengers' mobility, currently using the SW – NE route. It will interconnect two of the most crowded and populated districts, crossing the downtown.

The metro line will serve the Bucharest south-western residential districts and the trade on Alexandriei Ring Road, as well as Rahova and Ferentari districts, connecting the downtown with the north-south, Colentina – Voluntari. This metro line is scheduled to be executed under Public Private Partnership (PPP).

At the end of 2015, this project was included at Backup Projects Chapter (projects to be implemented in case of additional financing), within the Urban Sustainable Development

Mobility Plan Bucharest – Ilfov (USDMP Bucharest - Ilfov), as a prior condition to be financed from external non-reimbursable funds under Large Infrastructure Operational Programme 2014-2020 (LIOP 2014-2020).

The Bucharest metro network Global Development and Modernisation Strategy 2008-2030 shall be updated in 2016, in line with the governmental policies related to urban public transport infrastructure development in Bucharest and Ilfov County and also to establish the metro network development objectives on medium and long term.

The enacting of the new Bucharest metro Development Strategy 2016 – 2030 and its inclusion into the Public Politics Plan shall create the premises of the regional public transport systematic development with strategic focus upon Environment, Access, Safety, Economy and Urban Quality.

Investment program development

Development status of investment projects carried out by Metrorex S.A on 31.12.2015

P - program, A - achieved, % - percentage achievement rate — thousand Lei

No.	Investment objective		Total achieved 31/12/2015	State budget (Title 51.02.34)	State budget (Title 56)	State budget (Title 55)	Title 65 (funds with reimbursable financing)		Own resources
							Credit line	Local component	
	GRAND TOTAL, from which:	**P**	**1.238.026**	**215.816**	**962.596**	**3.000**	**0**	**17.646**	**38.968**
		A	**705.167**	**70.011**	**613.175**	**2.948**	**0**	**14.646**	**4.387**
		%	**56,96%**	**32,44%**	**63,70%**	**98,27%**	**0%**	**83,00%**	**11,26%**
A.	***Ongoing works, from which:***	**P**	**1.058.458**	**215.816**	**799.307**	**3.000**	**0**	**17.646**	**22.689**
		A	**553.739**	**70.011**	**463.164**	**2.948**	**0**	**14.646**	**2.970**
		%	**52,32%**	**32,44%**	**57,95%**	**98,27%**	**0%**	**83,00%**	**13,09%**
1	Metro Line 4	**P**	**372.376**	**150.000**	**217.376**	**3.000**	**0**	**0**	**2.000**
		A	**269.009**	**59.325**	**206.722**	**2.948**	**0**	**0**	**14**
		%	**72,24%**	**39,55%**	**95,10%**	**98,27%**	**0%**	**0%**	**0,70%**
2	Metro Line 2	**P**	**1.000**	**0**	**0**	**0**	**0**	**0**	**1.000**
		A	**1**	**0**	**0**	**0**	**0**	**0**	**1**
		%	**0,10%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0,10%**
3	Metro Line 5, Section Universitate - Drumul Taberei	**P**	**436.514**	**23.316**	**408.198**	**0**	**0**	**0**	**5.000**
		A	**226.882**	**3.829**	**223.030**	**0**	**0**	**0**	**23**
		%	**51,98%**	**16,42%**	**54,64%**	**0%**	**0%**	**0%**	**0,46%**
4	Modernisation of electrical installations on Metro Lines 1, 2, 3 and connection link	**P**	**44.000**	**0**	**37.100**	**0**	**0**	**0**	**6.900**
		A	**17.103**	**0**	**14.405**	**0**	**0**	**0**	**2.698**
		%	**38,87**	**0%**	**38,83%**	**0%**	**0%**	**0%**	**39,10%**
5	Facilities for passengers with disabilities	**P**	**500**	**0**	**0**	**0**	**0**	**0**	**500**
		A	**2**	**0**	**0**	**0**	**0**	**0**	**2**
		%	**40%**	**0%**	**0%**	**0%**	**0%**	**0%**	**40%**
6	Bucharest International Airport Rail Access Link Project	**P**	**43.789**	**42.500**	**0**	**0**	**0**	**0**	**1.289**
		A	**6.892**	**6.857**	**0**	**0**	**0**	**0**	**35**
		%	**15,74%**	**16,13%**	**0%**	**0%**	**0%**	**0%**	**2,72%**
7	Metro Line 5, Section Universitate - Pantelimon	**P**	**160.279**	**0**	**136.633**	**0**	**0**	**17.646**	**6.000**
		A	**33.850**	**0**	**19.007**	**0**	**0**	**14.646**	**197**
		%	**21,12%**	**0%**	**13,91%**	**0%**	**0%**	**83,00%**	**3,28%**
C.	***Other investment expenditures TOTAL, from which:***	**P**	**179.568**	**0**	**163.289**	**0**	**0**	**0**	**16.279**
		A	**151.428**	**0**	**150.011**	**0**	**0**	**0**	**1.417**
		%	**84,33%**	**0%**	**91,87%**	**0%**	**0%**	**0%**	**8,70%**
b.	Independent logistics	**P**	**179.568**	**0**	**163.289**	**0**	**0**	**0**	**16.279**
		A	**151.428**	**0**	**150.011**	**0**	**0**	**0**	**1.417**
		%	**84,33%**	**0%**	**91,87%**	**0%**	**0%**	**0%**	**8.70%**