The public transportation is one of the definitive elements that ensures the mobility of all people and in this way their integrity in the social and economical life of the community. Currently, we can no longer talk about the solving of the traffic issues in a city with more than 2 million inhabitants without taking into account the metro transportation network and recognize it as the basic means of public transportation. Therefore, the policy of Metrorex is to extend the metro network, as a system with improved parameters and capacity characteristics and also with superior speed, a network that is able to take over the current and envisaged traffic, on major directions of transportation demands. On these lines, it is appropriate to observe the aid given by the Romanian Government and Minister of Transportation, that in the last years have engaged themselves and appropriated important sums of money for the modernization and development of the Bucharest’s metro transportation network.

Nowadays, the four existing metro lines ensure the daily transportation of over 600,000 passengers, in almost all the areas of the capital. The metro provides a comfortable and economical means of transportation, maintaining its market share, the number of passengers that travel by metro representing approximately 20% of the total number of those using the public transportation vehicles, while the length of the metro network covers about 4% of the total length of București’s public transportation network. Within the hierarchy of the European countries, the Romanian metro is placed among the first half ranked metros, with a real tendency of rising the chart.

Metrorex is in a continuous process of modernization and development, of adapting to the market demands, permanently meeting halfway its changing tendencies. The answer given to the transportation demand is prompt and it is based on competence, professionalism and on the experience of the society’s specialists’ team. Through the help and work given by the over 4,200 employees, Metrorex is determined to fulfill the responsibility towards the community. In this context, the rigging of the metro stations with equipment for persons with special needs, is assumed by Metrorex as a part of its functioning and development strategy. It is permanently monitored and there are taken into account future developments. At the same time, the company constantly develops programs that have as a purpose the protection of the environment, aligning itself with the national and international environmental politics.

Discovering with satisfaction the growing number of persons that choose the metro as a means of transportation, we thank the people of Bucharest for the trust they put in our services and we assure them of the fact that all the company’s employees will put efforts so that day by day they can add value to this important public space – București’s metro.

Aurel Radu,

GENERAL DIRECTOR OF METROREX
**www.metrorex.ro**

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**Harta retelei de transport**

Lungimea retelei de metrou a municipiului București se întinde pe 69,23 km cu 32 puncte de înălțare din care 31 de stații. În construcție, trei liniile funcționează și trei mai, 16 km, 11 stații, detalii pe www.metrorex.ro

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**File de istorie**

15 februarie 1972
Se înființează instituția unei comisii care să elevizeze proiectul concret al realizării metroului.

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**Galerie foto**

Pentru a vizita galeria foto, apăsați pe fotografie de mai sus.

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**Comunicate de presă**

- **27 septembrie 2012**

- **19 septembrie 2012**

- **15 septembrie 2012**
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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 București” and, by reorganization, according to the Government Decision no. 482/1999, it became “Societatea Comercială de Transport cu Metroul București 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 within 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 4,247 employees, distributed in main subdivisions, 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 IV, section from 1 Mai to Parc Bazilescu of 2,3 km length, double track, and two new stations: 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.

A few important data about Bucharest Metro

- January 1986 – the First Section of Line II was commissioned.
- October 1987 – the Second Section of Line II (Piaţa Unirii II - Pipera) was commissioned.
- December 1987 – additional to Crângaşi, another station was commissioned, Gara de Nord.
- August 1989 – the Line III connecting the Gara de Nord and Dristor 2 was commissioned.
- May 1991 – Antilopa metro station and the segment between Republica and Antilopa was commissioned.
- At the end of 1992 – Basarab 1 station, built between Crângaşi and Gara de Nord stations was commissioned.
- 1998 – the station that marked the running direction from Armata Poporului (“Lujerului”) to Păcii was commissioned.
- March 1st, 2000 – Line IV was commissioned.
- November 19th, 2008 – the extension section of Line III, from Nicolae Grigorescu to Liniia de Centură (Ring Belt of the city) was commissioned.
- July 1st, 2011 – the extension section of Line IV, from Jiului to Parc Bazilescu was commissioned.
**CHAPTER 2. BUCHAREST METRO NETWORK**

The operating metro network is structured as follows:

<table>
<thead>
<tr>
<th>Metro Line/Extension</th>
<th>Route</th>
<th>Km</th>
<th>Stations</th>
<th>Commissioned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metro Line I</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PANTELIMON - REPUBLICA- EROILOR - GARA DE NORD – DRISTOR 2</td>
<td>31.01</td>
<td>21 (out of which, 7 common stations with Metro Line III)</td>
<td>In stages 1979 - 1990</td>
</tr>
<tr>
<td>Extension</td>
<td>Petrache Poenaru - Timpuri Noi</td>
<td>8.63</td>
<td>6</td>
<td>November 1979</td>
</tr>
<tr>
<td>Extension</td>
<td>Timpuri Noi - Republica</td>
<td>10.10</td>
<td>6</td>
<td>December 1981</td>
</tr>
<tr>
<td>Extension</td>
<td>Petrache Poenaru - Crângași</td>
<td>0.97</td>
<td>1</td>
<td>December 1984</td>
</tr>
<tr>
<td>Extension</td>
<td>Crângași - Gara de Nord</td>
<td>2.83</td>
<td>2</td>
<td>December 1987</td>
</tr>
<tr>
<td>Extension</td>
<td>Gara de Nord - Dristor 2</td>
<td>7.8</td>
<td>6</td>
<td>December 1989</td>
</tr>
<tr>
<td>Extension</td>
<td>Republica – Pantelimon</td>
<td>0.68</td>
<td>1</td>
<td>January 1990</td>
</tr>
<tr>
<td><strong>Metro Line II</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BERCENI - PIPERA</td>
<td>18.68</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Extension</td>
<td>Berceni – Piața Unirii 2</td>
<td>9.96</td>
<td>8</td>
<td>January 1986</td>
</tr>
<tr>
<td>Extension</td>
<td>Piața Unirii 2 - Pipera</td>
<td>8.72</td>
<td>6</td>
<td>October 1987</td>
</tr>
<tr>
<td><strong>Metro Line III</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ANGHEL SALIGNY – N. GRIGORESCU - EROILOR - PRECIZIEI</td>
<td>22.2</td>
<td>15 (7 common stations with Metro Line I)</td>
<td></td>
</tr>
<tr>
<td>Extension</td>
<td>N. Grigorescu – Eroilor</td>
<td>8.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extension</td>
<td>Eroilor – Preciziei</td>
<td>8.83</td>
<td>5</td>
<td>August 1983</td>
</tr>
<tr>
<td></td>
<td>Stația Gorfului – Nava 2 – Nava1</td>
<td></td>
<td></td>
<td>July 1996 November 1999</td>
</tr>
<tr>
<td>Extension</td>
<td>N. Grigorescu 2 – Anghel Saligny</td>
<td>4.7</td>
<td>4</td>
<td>November 2008</td>
</tr>
<tr>
<td><strong>Metro Line IV</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LAC STRĂULEȘTI - GARA DE NORD – GARA PROGRESU</td>
<td>5.54</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Extension</td>
<td>Gara de Nord – 1 Mai</td>
<td>3.24</td>
<td>4</td>
<td>March 2000</td>
</tr>
<tr>
<td>Extension</td>
<td>1 Mai – Parc Bazilescu</td>
<td>2.3</td>
<td>2</td>
<td>July 2011</td>
</tr>
</tbody>
</table>
3.1. Modernisations, upgrading

In compliance with the medium term modernisation and development strategy of Bucharest metro, in 2012, there were performed various 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:

- There were installed 30 indoor elevators and 14 outdoor elevators in 18 metro stations;
- There were modernised the low voltage electrical sub-stations and installations in 16 electric sub-stations;
- It was commissioned the computer based interlocking system – Ebilock 950 - on Metro Line 3, from Eroilor to Preciziei (Industriilor);
- There were mounted 151 contactless validators BRD “Instant Pay” in 45 metro stations;
- Modernisation of installations on Metro Lines 1, 2, 3 and connection links. Extension of control access and automatic fare collection installations. Mounting and integration into the passengers control access and fare collection system of some access gates in the metro stations for disabled passengers using wheelchairs;
- There were installed and commissioned the equipments supplied by Bombardier Transportation and Dimetronic in the Control Traffic Centre(servers, working stations, projector panel);
- It was commissioned the Interlocking “CE_W” installation, Westrace type (Westinghouse Train Radio and Advanced Control Equipment), supplied by Dimetronic on the route from Iuliu to Parc Bazilescu, and also the installations in the control traffic centre and Fiber optics communications on Metro Line 4.

3.2. Traffic and rolling stock fleet improvement

Together with the maintenance services supplier (ALSTOM Transport S.A.), it was initiated a major rolling stock fleet modernisation project for the old metro trains type ASTRA ARAD. In 2012 there were put into service for commercial transport 4 modernised trains. The modernisation program will continue in 2013, another 15 metro trains being about to be further modernised.

Within the frame of the same program, there were repaired and modernised 4 railway engines and 9 metro cars destined for materials technological transport.

3.3 Trip and access conditions improvement

Starting with November 3rd, 2012, based upon an agreement signed between Metrorex, R.A.T.B. and the Bucharest Municipality, there were introduced common tickets Metrorex – R.A.T.B.

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

Since 1994, S.C. 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 S.C. 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 S.C. METROREX S.A. attended in 2012:
Abroad trips:

During the reporting period, based upon the supplying contracts and received invitations, the staff of S.C. Metrorex S.A attended to international events (conferences, congresses, events dedicated to transport technology), training seminar ROM-P5, seminar organised by the European Transport Metropolitan Authority Association together with DG – MOVE within the European Union, acceptances at the suppliers’ plants, technical meetings BRD/IDR/FDR for BM3 metro trains, stand tests for the components of the BM3 metro trains.

Domestic trips:

During the reporting period, the Metrorex staff attended to training and/or technical inspections activities, and also participated to urban public transport events.

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 transportations, decisions of the general director. The General Director’s Cabinet 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).

Our company has initiated and organized cultural, social and educational partnerships through which has been ensured the propagation of the institutional public message and has realized the transposition into practice of the concept of social responsibility and sustainability.

We have monitored the news flow of the press agencies, radio and TV broadcasts for specific aspects mentioning Metrorex, we have optimized our company’s internet pages, in collaboration with other involved departments.

We have ensured the external information of different partners, and also the cooperation with other organizational structures, for the fulfillment of responsibilities regarding public information and decisional transparency: subway passengers, mass-media, banks and insurance companies (World Bank and The European Investment Bank as a community of investors), groups focused on special interests (Japan’s Government), legislative bodies, authorities, ministers’ governance, the academic community, unions, the international carriers’ community (UITP).

We have issued and delivered information and promotion materials regarding the company’s activity (folders, T-shirts and pads that were printed with the subway network, calendars, paper holders).

Metrorex has answered in 2012 to a number of 1170 requests of information of public interest, has broadcasted 50 press releases and has initiated, organized and developed 34 social, cultural and educational partnerships, well reflected in mass-media (5 press agencies, 10 TV stations, 14 written press websites and 20 online news websites, forum websites and personal blogs). The average answer time for the requests was of 4 days. After monitoring the impact of the communication activity on subway passengers, we have ascertained the growing satisfaction of our clients towards the company’s performance. 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.

We assure the subway passengers that Metrorex was, is and will be a loyal partner that will define the public transportation through rapidity, comfort, safety and a sustained effort to adapt to the challenges of the future.
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 2012 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 staff at the end of 2012 was of 4,247 employees.

The average number of staff development during 2009 - 2012

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number</td>
<td>4.146</td>
<td>4.110</td>
<td>4.117</td>
<td>4.158</td>
</tr>
</tbody>
</table>

Graphic 1
The average number of staff development during 2009 - 2012
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 10,30 m.

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.

Since these suspended ceilings are quite old, the company initiated and promoted a modernisation program of these systems in all metro stations.

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.

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.

5.1.2.1. Installation in passengers’ service

Each station also has:

- general lighting system;
- escalators;
- sounding and remote sounding installation 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;
- 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 m³/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°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.

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;
Due to the great territorial dispersion of installation, the imperative 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, sends the speed codes from the rolling track (rail) to the onboard equipment, detects the rolling stock presence on the involved area, verifies the rakes 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.

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, S.C. Metrorex S.A management, police station etc.).

The completion of the installations modernisation and upgrading programs, and also the commissioning of new installations had led to decreasing of failures and also of 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, sited on gravel sand bed 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) sited on concrete bed.

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:

- 64,184 constructive km on Metro Lines 1 and 3, and 64,625 constructive km on Metro Lines 2 and 4;
- rolling track recurrent maintenance: 20,509 km on Metro Lines 1 and 3, and 18,574 km on Metro Lines 2 and 4;
- switches recurrent maintenance: 20/1/2/1 – Metro Lines 1 and 3, and 16/-/1 – Metro Lines 2 and 4;
- tunnel and gallery maintenance: 66,196 km on Metro Lines 1 and 3, and 68,518 km on Metro Lines 2 and 4;
- rolling track maintenance, repairs, revisions, measurements, lines’ checking with the crack detector: 80,693 constructive km on Metro Lines 1 and 3 and 868,7 constructive km on Metro Lines 2 and 4;
- metro stations suspended ceilings and ditches maintenance: 57,313 m² on Metro Lines 1 and 3, 70,733 m² on Metro Lines 2 and 4;

5.1.6. Labour conditions improvement

In 2012, 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, crockery & tiles mounting;
- rooms subdivisions using plasterboard;
- sanitation works;
- electric heaters repairs;
- furniture manufacture (office cupboards, desks, tables, chairs, hangers, flooring etc.);
- metallic grates, doors and outdoor windows manufacture.

5.2. Rolling stock

5.2.1. Rolling stock fleet - structure

The structure of the rolling stock fleet is as follows:

<table>
<thead>
<tr>
<th>Indicators</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventory rolling stock fleet, from which:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) IVA (old) metro cars, manufactured by Astra Arad, Romania</td>
<td>343</td>
<td>288</td>
<td>286</td>
<td>280</td>
</tr>
<tr>
<td>b) BM 2 and BM21 new metro trains generation</td>
<td>264</td>
<td>264</td>
<td>264</td>
<td>264</td>
</tr>
<tr>
<td>Operating rolling stock fleet, from which:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) IVA (old) metro cars, manufactured by Astra Arad, Romania</td>
<td>69</td>
<td>84</td>
<td>76</td>
<td>79</td>
</tr>
<tr>
<td>b) BM 2 and BM21 new metro trains generation</td>
<td>220</td>
<td>228</td>
<td>228</td>
<td>224</td>
</tr>
<tr>
<td>Total operating rolling stock fleet, from which:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) IVA (old) metro cars, manufactured by Astra Arad, Romania</td>
<td>68</td>
<td>82</td>
<td>76</td>
<td>78</td>
</tr>
<tr>
<td>b) BM 2 and BM21 new metro trains generation</td>
<td>199</td>
<td>218</td>
<td>225</td>
<td>221</td>
</tr>
</tbody>
</table>

Legend:
- IVA (old) metro cars, manufactured by Astra Arad, Romania
- BM 2 and BM21 new metro trains generation

Graphic 2: Inventory rolling stock fleet in 2011

Graphic 3: Operating rolling stock fleet in 2012
5.2.2. Metro trains constructive characteristics

The existing rolling stock fleet consists both of electric metro trains manufactured by “Întreprinderea de Vagoane Arad” (IVA), configured in 2 metro cars units, and new Bombardier Transportation Sweden type BM2 and BM21 metro trains, configured in 6 permanently coupled metro cars.

### 5.2.2.1 IVA metro trains of old generation

- 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 to make reliable 90 cars – 15 IVA metro trains.

Therefore, until the end of 2012, there were finalized the reliability works for 42 cars – 7 metro trains. This process will continue and is scheduled to be completed in 2013.

### 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.

<table>
<thead>
<tr>
<th>Technical characteristics of the IVA type metro unit, manufactured by Astra Arad, Romania, (configuration of 2 metro cars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of unit over couplers</td>
</tr>
<tr>
<td>Maximum width (with closed doors)</td>
</tr>
<tr>
<td>Maximum height from NSS (over pantograph in the lower position)</td>
</tr>
<tr>
<td>Floor height from NSS</td>
</tr>
<tr>
<td>Gauge</td>
</tr>
<tr>
<td>Tare Weight</td>
</tr>
<tr>
<td>Seating capacity</td>
</tr>
<tr>
<td>Standing capacity for 4 passengers/ m²</td>
</tr>
<tr>
<td>Standing capacity for 8 passengers/ m²</td>
</tr>
<tr>
<td>Supply voltage</td>
</tr>
<tr>
<td>Traction power</td>
</tr>
<tr>
<td>Driving with starting series – parallel controller and braking with auto-compensatory separate excitation</td>
</tr>
<tr>
<td>Control voltage</td>
</tr>
<tr>
<td>Automatic control system for metro unit car starting and braking</td>
</tr>
<tr>
<td>Service braking</td>
</tr>
<tr>
<td>Braking when stopped</td>
</tr>
<tr>
<td>Emergency braking</td>
</tr>
<tr>
<td>Maximum speed</td>
</tr>
<tr>
<td>Commercial speed</td>
</tr>
</tbody>
</table>

5.2.2.2 BM2/BM21 metro trains of new generation

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.
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.

5.2.2.3 Procurement of new generation metro trains

Since the number of transported passengers is increasing, Metrorex initiated in 2011 an open bidding procedure for the procurement of 16 new metro trains (96 cars), in order to satisfy the transport demand on Metro Lines 1, 2 and 3, to improve the transport conditions and to replace the old IVA rolling stock fleet. The bidding procedure having as scope the “procurement and commissioning of 16 new metro trains” was successfully completed by signature of a commercial contract with the rolling stock supplier Construcciones y Auxiliar de Ferrocarriles (CAF) – S.A – Spain.

Table 4. Technical characteristics of the new metro trains generation type BM2 and BM21 (configuration of 6 metro cars)

<table>
<thead>
<tr>
<th>Technical characteristics of the new metro trains generation type BM2 and BM21 (configuration of 6 metro cars)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of unit over couplers</td>
<td>112.610 mm</td>
</tr>
<tr>
<td>Maximum width</td>
<td>3.100 mm</td>
</tr>
<tr>
<td>Axle load max.</td>
<td>max. 14 tons</td>
</tr>
<tr>
<td>Maximum height from NSS (over the roof)</td>
<td>3.460 mm ;</td>
</tr>
<tr>
<td>Floor height from NSS</td>
<td>1.120 mm ;</td>
</tr>
<tr>
<td>Gauge</td>
<td>1.432 mm ;</td>
</tr>
<tr>
<td>Tare Weight</td>
<td>173.5 tons</td>
</tr>
<tr>
<td>Seating capacity</td>
<td>216</td>
</tr>
<tr>
<td>Standing capacity for 4 passengers/m²</td>
<td>984</td>
</tr>
<tr>
<td>Standing capacity for 8 passengers/ m²</td>
<td>2.184</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>750 Vcc 3rd rail in traffic and pantograph in depots</td>
</tr>
<tr>
<td>Traction motor rating</td>
<td>16 asynchronous motors 125 kW each</td>
</tr>
<tr>
<td>Maximum acceleration</td>
<td>1,25 m/s</td>
</tr>
<tr>
<td>Service deceleration</td>
<td>1,2 m/s</td>
</tr>
<tr>
<td>Emergency deceleration</td>
<td>1,3 m/s</td>
</tr>
<tr>
<td>Braking system</td>
<td>Microprocessor controlled, tread brakes</td>
</tr>
<tr>
<td>Propulsion system</td>
<td>IGBT converters One inverter for 2 parallel traction motors MITRAC control system 3-phase asynchronous motors</td>
</tr>
<tr>
<td>Auxiliary systems</td>
<td>2 static converters with battery charger 400 V AC 50 Hz and 110 V DC 2 compressors, piston type</td>
</tr>
<tr>
<td>Maximum speed</td>
<td>80 km/h</td>
</tr>
</tbody>
</table>

- 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);

5.2.2.3 Procurement of new generation metro trains

Since the number of transported passengers is increasing, Metrorex initiated in 2011 an open bidding procedure for the procurement of 16 new metro trains (96 cars), in order to satisfy the transport demand on Metro Lines 1, 2 and 3, to improve the transport conditions and to replace the old IVA rolling stock fleet. The bidding procedure having as scope the “procurement and commissioning of 16 new metro trains” was successfully completed by signature of a commercial contract with the rolling stock supplier Construcciones y Auxiliar de Ferrocarriles (CAF) – S.A – Spain.

In order to improve the traffic safety and passengers’ comfort, 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;
- additional number of seats (6 per train);
• improved design of passengers seats;
• fluorescent strip at access doors’ sill;
• improved the 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 openable 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.

The contract will be carried out during 2011 – 2014 and the metro trains are about to be put into service starting with the second half of 2013.

By this procurement, Metrorex will finalize an important stage of the Bucharest metro modernisation project, providing 60 new metro trains of new generation for the passengers’ public urban transportation system.

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

To provide the technical compatibility and fully operation, these systems were procured by Metrorex within 2011 from Bombardier Transportation –Rail Control Systems Divisions, further to a procurement procedure by direct negotiation, with no prior notice.

5.2.3 Timetables
The following aspects were taken into account when using the timetables in 2012:
• 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 capable.

Therefore, the here below timetables were used:
• for business days (Monday – Friday) were used timetables according table 5

Table 5. Timetables for business days (Monday – Friday):

<table>
<thead>
<tr>
<th>No.</th>
<th>Metro Line</th>
<th>Timetable</th>
<th>Applicable period</th>
<th>Metro trains headway</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Metro Line 1: Pantelimon-Republica</td>
<td>A1338</td>
<td>01.01-30.04.2012</td>
<td>20 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A1339</td>
<td>01.05-17.06.2012</td>
<td>16 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A1340</td>
<td>18.06-31.12.2012</td>
<td>16 min</td>
</tr>
<tr>
<td></td>
<td>Metro Line 1: Republica-Dristor 2</td>
<td>A1338</td>
<td>01.01-30.04.2012</td>
<td>6 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A1339</td>
<td>01.05-17.06.2012</td>
<td>6 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A1340</td>
<td>18.06-31.12.2012</td>
<td>7 min</td>
</tr>
<tr>
<td></td>
<td>Metro Line 3: Anghel Saligny – Preciziei</td>
<td>A1338</td>
<td>01.01-30.04.2012</td>
<td>6 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A1339</td>
<td>01.05-17.06.2012</td>
<td>6 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A1340</td>
<td>18.06-31.12.2012</td>
<td>7 min</td>
</tr>
<tr>
<td></td>
<td>The common section of Metro Lines 1 and 3 Nicolae Grigorescu - Eroilor</td>
<td>A1338</td>
<td>01.01-30.04.2012</td>
<td>3 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A1339</td>
<td>01.05-17.06.2012</td>
<td>3 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A1340</td>
<td>18.06-31.12.2012</td>
<td>3,5 min</td>
</tr>
<tr>
<td>2</td>
<td>Metro Line 2: Berceni – Pipera</td>
<td>A249</td>
<td>01.01-17.06.2012</td>
<td>3 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A250</td>
<td>10.09-31.12.2012</td>
<td>4 min</td>
</tr>
<tr>
<td>3</td>
<td>Metro Line 4: Gara de Nord 2 – Parc Bazilescu</td>
<td>A408</td>
<td>01.01-17.06.2012</td>
<td>7 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C407</td>
<td>18.06-31.12.2012</td>
<td>8 min</td>
</tr>
</tbody>
</table>

Table 6. Timetables for statutory days (including Saturdays, Sundays and legal holidays):

<table>
<thead>
<tr>
<th>No.</th>
<th>Metro Line</th>
<th>Timetable</th>
<th>Applicable period</th>
<th>Metro trains headway</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Metro Line 1: Pantelimon-Republica</td>
<td>C1334</td>
<td>01.01-31.12.2012</td>
<td>-20 min. all day long</td>
</tr>
<tr>
<td></td>
<td>Metro Line 1: Republica-Dristor 2</td>
<td>C1334</td>
<td>01.01-31.12.2012</td>
<td>-peak hours = 8 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-off peak hours = 9 ÷ 10 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-in rest = 9 ÷ 10 min.</td>
</tr>
<tr>
<td></td>
<td>The common section of Metro Lines 1 and 3 Nicolae Grigorescu - Eroilor</td>
<td>C1334</td>
<td>01.01-31.12.2012</td>
<td>-peak hours = 4 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-off peak hours = 4 ÷ 5 min.</td>
</tr>
</tbody>
</table>

For 2013, 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 S.C. METROREX S.A. consist of 47 IVA metro trains (280 cars), 44 BM new metro trains (264 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 S.C. 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.

5.2.5. Rolling stock mileage

Table 7 - Rolling stock mileage

<table>
<thead>
<tr>
<th>YEAR</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolling stock mileage (thousand Km)</td>
<td>6.739,4</td>
<td>8.169,2</td>
<td>8.387,05</td>
<td>8.612,67</td>
</tr>
</tbody>
</table>

5.2.6 Energy consumption

The energy consumption development within 2009 - 2012 is shown below:

Table 8 - The energy consumption development within 2009 - 2012 (MWh)

<table>
<thead>
<tr>
<th>YEAR</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric power, out of which:</td>
<td>158.194,5</td>
<td>174.790,5</td>
<td>170.939,8</td>
<td>174.153,41</td>
</tr>
<tr>
<td>- for traction</td>
<td>88.210,4</td>
<td>97.882,7</td>
<td>95.726,3</td>
<td>96.384,44</td>
</tr>
<tr>
<td>- for installation</td>
<td>69.984,1</td>
<td>76.907,8</td>
<td>75.213,5</td>
<td>77.768,97</td>
</tr>
</tbody>
</table>

Compared with 2011, the electric power consumption increased in 2012 with around 2.47%, due to metro trains timetables adjustments, by decreasing the headway during peak hours and subsequent increasing during off peak hours.
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:

Table 9 - Number of transported passengers during 2009-2012

<table>
<thead>
<tr>
<th>YEAR</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transported passengers (Thousand passengers)</td>
<td>170.888</td>
<td>174.670</td>
<td>170.525</td>
<td>172.555</td>
</tr>
</tbody>
</table>

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

Table 10 - Number of transported passengers for each metro line.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML 1</td>
<td>87.199</td>
<td>86.144</td>
<td>82.643</td>
<td>82.188</td>
</tr>
<tr>
<td>ML 2</td>
<td>60.416</td>
<td>62.448</td>
<td>60.897</td>
<td>61.222</td>
</tr>
<tr>
<td>ML 3</td>
<td>18.995</td>
<td>21.576</td>
<td>22.000</td>
<td>23.606</td>
</tr>
<tr>
<td>ML 4</td>
<td>4.278</td>
<td>4.502</td>
<td>4.985</td>
<td>5.539</td>
</tr>
</tbody>
</table>

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):
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
RATB ACTIV card, accepted by Metrorex, out of which:
monthly pass with unlimited trips
monthly pass with limited trips (62 trips)
weekly pass
electronic wallet
common ticket METROREX - RATB, out of which:
single ticket for 60 minutes
single ticket with 10 trips of 60 minutes each
single daily pass
AVC magnetic ticket
Contactless PayPass Bank card
Mobile phone using text message
Mobile phone using NFC (Near Field Communication) technology

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.

For 2012, 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 August 6th, 2012, the metro trip fares were adjusted according to the Order no. 1.269/02.08.2012 issued by the Minister of Transports.

- 2 trips ticket .......................................................... 4 lei
- 10 trips ticket ......................................................... 15 lei
- Daily pass............................................................... 6 lei
- Monthly pass with unlimited trips:
  - fully paid ......................................................... 60 lei
  - 50% discounted (pupils and students) ................. 30 lei
- Monthly pass with limited trips (62 trips)
  - fully paid ......................................................... 50 lei
  - 50% discounted (pupils and students) ................. 25 lei
- Weekly pass (7 days) with unlimited trips ............ 20 lei

• METROREX ticket activated as RATB ACTIV card, out of which:
  - monthly pass with unlimited trips ....................... 60 lei
  - monthly pass with limited trips (62 trips) ............ 50 lei
  - weekly pass ..................................................... 20 lei
  - electronic wallet (can be charged with any amount) and rated with ........................................ 2 lei/trip

Further the agreement signed between Metrorex and the Bucharest Municipality in October 2012, starting with November 3rd, 2012, there were introduced the here below trip titles:

1. Single ticket valid 60 minutes from the first validation, both to Metrorex and RATB, with unlimited validations during the validity period of 60 minutes .................................................. 5 lei (2 lei at Metrorex).

2. Multiple 10 trips single ticket valid 60 minutes with unlimited validations, both to Metrorex and RATB, during the validity period of 60 minutes .................................................. 30 lei (15 lei at Metrorex).

3. Single daily pass with unlimited validations both to RATB and Metrorex, valid 24 hours starting with the first validation ................................................................. 16 lei (6 lei at Metrorex).

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.
The investment program in 2012 was prepared based upon the Bucharest metro development, upgrading and modernisation strategy, structured on the following main directions:

1. Ongoing activities with a view to complete the related investment works under different stages of designing and/or execution;
2. Preparations to initiate new investments objectives for the Bucharest metro network extension and modernisation.

The approved funds for the investment activity in 2012, as per the Budget Law no. 293/2011 were at the beginning of the year of 765,616 thousand Lei in total, structured as here below:

- **Budget allocation**: 765,616 thousand lei
  - Investments of state owned companies: 77,488 thousand lei
  - Expenditures related to reimbursable programs: 688,128 thousand lei

By the budget amendment enacted by the Government Decision no. 61/2012, the investments budget of Metrorex, in its approved structure, became at the end of year:

- **Budget allocation**: 571,737 thousand lei
  - Investments of the state owned companies: 55,791 thousand lei
  - Expenditures related to reimbursable programs: 515,946 thousand lei.

This action had serious consequences at the level of planned production, already adjusted below normal value for timely completion of the ongoing objectives, being strictly limited to the amount of originally approved funds.

Further the Ministry of Public Finances dissaproval to be opened the credit lines, in December there could not be made payments in total amount of 87,340 thousand lei from Title 65 and 5,403 thousand lei from Title 55. These debts were scheduled for payment in Q1 2013 from the budget allocated for 2013, which has negatively affected the activity by reducing the effective budget allocated for that year.

The approved amounts for expenditures from the state budget and the expenditures related to reimbursable programs in 2012 were used for the here below investments objectives:

**Metro Line 4:**

**Section Gara de Nord – Parc Bazilescu - Lac Străulești and Section from Gara de Nord to Gara Progresu**

**Section 1 Mai – Parc Bazilescu**

There were completed the works related to dynamic information system and traffic safety and automation installations, works that didn't influence the full commissioning.

**Section Parc Bazilescu – Lac Străulești**

On July 14th, 2012, it was signed with the Joint Venture consisting of ASTALDI SpA – S.C. SOMET S.A. – S.C. TIAB SA – S.C. UTI CONSTRUCTION & FACILITY MANAGEMENT S.A the civil works contract: „Metro Line 4, Section 2, Parc Bazilescu – Lac Străulești, Construction works for tunnel, gallery, stations, depot, multimodal terminal and related installations with a view to be commissioned”. The inception order was issued and there were performed designing works, some of the site organization works and also public utility diversions. There
were also made the preparations for the commencement of structure works on the new section in continuation of the existing structure.

There were continued the legal actions and procedures related to land and real estates expropriation. Hence, on June 20th, 2012 it was approved the Government Decision no. 619 concerning the initiation of expropriation procedures of the private property estates representing the expropriation corridor for the public utility work „Extensions of the Bucharest metro network, Section I Nicolae Grigorescu 2 – Anghel Saligny and Section II Gara de Nord 2 – Basarab – Laminorului - Lac Străulești” related to the section „Laminorului - Lac Străulești”. Although the legal conditions were fulfilled, the provisions of the Government Decision no. 619 could not be applied due to lack of funds to compensate the owners. Such compensations – at the level of 2012 – represent around 26 million lei.

Under these circumstances, the works rhythm had been reduced at the level of available funds, the works being limited to the surfaces owned by the state in this area, by their transfer from local administration.

**Section Gara de Nord – Gara Progresu :**

- There is under preparation the technical documentation and the bidding documents to launch the bidding procedure for Pre-feasibility and Feasibility Studies;
- The action related to the feasibility study preparation was proposed and approved on the list of objectives about to be financed under the Swiss – Romanian Cooperation Programme granted by the Swiss Confederation;
- It was approved the Final project Proposal to be financed under the Framework Agreement signed between the Government of Romania and the Swiss Confederation for „Pre-Feasibility Study (PFS) and Feasibility Study (FS) for construction of Metro Line 4: Lac Străulești – Gara Progresu, extension Gara de Nord – Gara Progresu”;
- Further the audit mission of the Swiss Federal Audit Office which took place in Bucharest, on September 6th, 2012, it was agreed the extension of the Project scope by including three additional activities:
  - multimodal motion study focusing on the surface motion impacts of the planned Metro Line 4 extension;
  - security study related to the potential increase of traffic on Metro Line 4;
  - institutional partnership between S.C. Metrorex S.A and Swiss public transportation companies.

The Swiss Contribution to this project was approved for CHF 8.5 million, out of the total cost of CHF 10 million (no VAT included).

In 2012, it was also prepared the Project Agreement draft to be signed between the Ministry of Public Finance, as National Coordination Unit (NCO), the Ministry of Regional Development and Public Administration, as Intermediate Body (IB) and the State Secretariat for Economic Affairs of the Swiss Confederation (SECO).

**Metro Line 5**

Drumul Taberei – Universitate – Pantelimon

There were commenced the structure works for:

- **Section I and Valea Ialomiței station and depot:** In 2012, there were performed construction works of moulded walls, excavations, ground reinforcements, water discharge, public utility diversions, stations’ resistance structure (straps, floors, walls, foundation rafts) – for all 10 stations, including Valea Ialomiței depot, facilities to operate the tunnel boring machines, traffic diversions during various stages of execution, as well as manufacture of reinforced concrete elements needed for the tunnels structure, on the route from Drumul Taberei to Universitate, and also Valea Ialomiței station and depot. It is worth to be mentioned here that on November 15th and November 19th 2012, at Academia Militară metro station were placed into position the necessary tunnel boring machines (TBMs) in order to start the involved tunnels execution. Currently, there are under final stage of assembly and coupling the auxiliary equipments (power supply, ventilation systems, water supply, consolidation installations, conveyors etc.)
- **Section II:** For this section, there were carried out activities to prepare the bidding documents for works and equipping with installations for structure execution and involved commissioning.
- It was continued the designing activity for works, equipping and endowment, necessary for commissioning on the entire route of Metro Line 5.

The works supervision activity consisted of site monitoring and cooperation with contractors to agree upon the detailed designs, locations take over, and structure works supervision.
Installations modernisation on current metro lines

There were finalized the modernisation works of substations and low voltage installations on Metro Lines 1 and 3. The acceptance took place in stages after the works completion for the 27 power stations. Hence, in Q1 2013, the entire contract is entirely about to be completed.

Facilities for the passengers with disabilities

There were continued the mounting works of elevators (outdoor and indoor) in the existing metro stations to facilitate the access of passengers with disabilities in the metro network, and in 2013, there will be mounted the last 6 elevators of the contract.

Metro Line 2
Pipera – Berceni

There were prepared designs for the construction of new metro entrances.

Also, during 2013, there will be undertaken the necessary procedures to approve the new technical and financial indicators by Government Decision.

There were initiated the revision works of the preliminary technical designs and preparation of the awarding documents for structure works.

This Project is included in the Loan Agreement signed with the Government of Japan which provides this line co-financing.

Procurement of new metro trains

There were continued the consulting services for the procurement of 37 new metro trains to be operated on Metro Line 5 and replace the old rolling stock fleet.

There were continued the designing stages for the new metro trains, and also the related onboard equipment.

It was paid the first instalment of the advance payment related to the procurement of 16 new metro trains within the supplying contract signed between S.C. Metrorex S.A and Construcciones y Auxiliar de Ferrocarriles – CAF, Spain.

Metro Line 6
Bucharest International Airport Rail Access Link Project

In 2012, there were:
- Finalized the activities to review the feasibility study and updating the technical and financial indicators of this objective;
- Obtained certain permits necessary to perform this objective. This action is about to completed during 2013.

Also, during 2013, there will be undertaken the necessary procedures to approve the new technical and financial indicators by Government Decision.

There were initiated the revision works of the preliminary technical designs and preparation of the awarding documents for structure works.

This Project is included in the Loan Agreement signed with the Government of Japan which provides this line co-financing.

Other activities

In order to secure the necessary funds to achieve on time the investments projects, included in the Strategy of Metrorex, there were undertaken arrangements for Metrorex to be included on the list of potential beneficiaries of the Sectorial Operational Programme – Transports 2014 – 2020, in order to be able to use European Structural Funds (this measure is about to be implemented and is subject to the decision of the Ministry of Transports, Ministry of Public Finances and other bodies).
CHAPTER 8. 
FINANCIAL DATA IN 2012

8.1 Revenues development
The revenues of S.C. 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;
    ▶ Rolling stock maintenance (payments made in the current year for services performed within the previous year), 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. 3055/2009 and Law no. 259/2007 that modifies and amends the Accounting Law no. 82/1991;
• Revenues from subsidies to be received in order to cover the expenditures related to the contract concluded with ALSTOM, as per the legislation into force:
  ▶ Government Emergency Ordinance no. 34/2009 (Clause 13);
  ▶ Financial revenues
  ▶ Allocated amounts from the estate budget, including loans guaranteed by the government and reimbursed from budget allocations.

8.2 Expenditures development
The expenditures pattern is the following:
• Material expenditures

Table 11 The revenues pattern during 2009 - 2012

<table>
<thead>
<tr>
<th>Indicators</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thousand lei</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Total revenues and financial sources (I+II), from which:</td>
<td>495,849,36</td>
<td>552,904,49</td>
<td>577,192,79</td>
<td>613,926,70</td>
</tr>
<tr>
<td>Total revenues (1+2), from which:</td>
<td>469,249,18</td>
<td>549,781,08</td>
<td>577,192,79</td>
<td>613,926,70</td>
</tr>
<tr>
<td>Total revenues from operation (a+b+c+d+e), from which:</td>
<td>463,646,48</td>
<td>548,379,53</td>
<td>574,904,35</td>
<td>612,403,08</td>
</tr>
<tr>
<td>a) Fare box revenues</td>
<td>113,788,17</td>
<td>117,712,20</td>
<td>125,189,38</td>
<td>154,613,96</td>
</tr>
<tr>
<td>b) Revenues from operating subsidies, as per the turnover (b1 + b2), from which:</td>
<td>269,298,06</td>
<td>349,293,00</td>
<td>358,999,96</td>
<td>349,000,00</td>
</tr>
<tr>
<td>b1) Subsidies for the current operation activity</td>
<td>223,894,57</td>
<td>225,615,75</td>
<td>213,236,49</td>
<td>206,333,61</td>
</tr>
<tr>
<td>b2) Subsidies for the rolling stock maintenance contract concluded with ALSTOM</td>
<td>45,403,49</td>
<td>123,677,25</td>
<td>145,763,47</td>
<td>142,646,39</td>
</tr>
<tr>
<td>b3) Subsidies for the rolling stock maintenance contract concluded with ALSTOM (services performed in 2009 and paid in 2010)</td>
<td>55,044,94</td>
<td>42,534,00</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>c) Other revenues from operation, from which:</td>
<td>24,542,41</td>
<td>22,639,58</td>
<td>28,557,96</td>
<td>36,966,82</td>
</tr>
<tr>
<td>Revenues from commercial activities, association contracts, room or land rentals, advertisement etc.</td>
<td>24,542,41</td>
<td>22,639,58</td>
<td>28,557,96</td>
<td>36,966,82</td>
</tr>
<tr>
<td>d) Total revenues from other sources, from which:</td>
<td>56,017,84</td>
<td>58,734,75</td>
<td>62,157,05</td>
<td>71,822,30</td>
</tr>
<tr>
<td>d1) Revenues from operating subsidies (50% discounts granted to pupils and students, 100% discount granted to Revolution heroes and war veterans)</td>
<td>4,444,25</td>
<td>5,001,00</td>
<td>10,002,83</td>
<td>19,023,98</td>
</tr>
<tr>
<td>d2) 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. 3055/2009 and Law no. 259/2007 to modify and amend the Accounting Law no. 82/1991</td>
<td>51,573,59</td>
<td>53,733,75</td>
<td>52,154,22</td>
<td>52,798,32</td>
</tr>
<tr>
<td>2 Financial revenues</td>
<td>5,602,70</td>
<td>1,401,55</td>
<td>2,288,44</td>
<td>1,523,62</td>
</tr>
<tr>
<td>2 Subsidies for loans reimbursement</td>
<td>26,600,18</td>
<td>3,123,41</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Expenditures with power supply, heating and water
Expenditures with personnel, out of which:
  Gross wages
  Other staff expenditures
Expenditures related to the third parties services, out of which:
  Rolling stock repairs, as per the maintenance services contract signed with Alstom
Other expenditures (depreciation, social-cultural, protocol etc.)
Financial expenditures

The result of the 2012 financial year, as the difference between total revenues and total expenditures is negative, representing a loss of about 42.302 thousand lei, motivated by the fact that the revenues of the company have not been achieved at the level provided in the revenues and expenditures budget of the company, as approved in 2012, due to non-approval of tariff adjustment proposals made by METROREX from April 1st, 2012 (the adjustment has been approved starting with August 2012), proposal consisting the basis of a sound and balanced budget of revenues and expenditures, but also as a result of the re-assessment of the fixed assets of METROREX, part of the patrimony, which led to increased depreciation expenses.
CHAPTER 9.
Bucharest Metro Global Development and Modernization Strategy


To issue the metro development and modernization strategy, it was started from the identification of certain modalities of increasing 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 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. 1204 / 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, consisting of the following sub-components:
  - Technical assistance related to the establishment of the Bucharest Metropolitan Transport Authority;
  - Until 31st December 2007 there were finalized and submitted the Reports related to the functions and geographic coverage, funding and governance the Authority, as well as the organization and personnel structure. A study tour was conducted at the Metropolitan Transport Authorities in Barcelona (Spain) and Lyon (France). The Government Decision draft was finalized in November 2008 and subsequently submitted to the Ministry of Transports for being signed and promoted. Public consultations are currently ongoing; therefore, within the second half of 2011, the Romanian Government will approve a decision to regulate the establishment and entering into force the Bucharest Metropolitan Transport Authority. By the Law no. 8/2012 it was established the Bucharest Metropolitan Transport Authority, but there is under preparation a new government decision so that the Bucharest Metropolitan Transport Authority to be subsequently modified and adjusted to the real conditions of urban public transport in Bucharest – Ilfov area.
  - Technical assistance for short term measures to improve efficiency and effectiveness of Metrorex;
  - This project was completed in the second semester of 2007 when the Consultant submitted the Final Report. A series of recommendations were included in the Global Development Strategy of Metrorex
  - Technical Assistance for the Extension of Metrorex Services
within a Metropolitan Bucharest Public Transport Strategy and Investment Program. The Project was financed by the World Bank and completed in July 2009.

Due to all hereinabove and correlated with the attention granted to the local public transport by all factors involved both at local and governmental level, it is appreciated that in the future the results will appear, too. Therefore, there will be met requirements to increase the public transport efficiency, by metro, tram, trolley or bus and to improve the quality standard for the passengers’ service.

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
   Section 1 Drumul Taberei – Universitate
   Implementation period: 2010 -2017
   Total length: 9,035 Km
   Number of stations: 13
   Estimated cost: € 623.5 million + VAT
   This metro line will serve Drumul Taberei district which is defective on public transport services. The number of people is of 300,000 inhabitants and the buses, trolleybuses and tramway networks do not cover the traffic demand at peak hours.

   Section Universitate – Pantelimon
   Implementation period: 2013 -2019
   Total length: 8,074 Km
   Number of stations: 9
   Estimated cost: € 828.33 million + VAT
   It will provide the connection between Pantelimon district which is of over 250,000 inhabitants, the downtown and the south-western of Bucharest, Drumul Taberei district.

2. Metro Line 6 Bucharest International Airport Rail Access Link Project
   Execution period: 7 years
   Estimated commissioning: 2021
   Total length: 14 Km
   Number of stations: 12 (according to the Ministry of Transports and Infrastructure agreement)
   Estimated cost: € 1.852.00 million + VAT
   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 Bâneasa 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 Bâneasa Airport with Bâneasa, Basarab, Gara de Nord and Gara Progresu railway stations, and subsequently, the interconnection with the ground transportation.

3. Metro Line 4 Lac Străulești – Gara de Nord - Gara Progresu
   Section from Laminorului to Lac Străulești
   Total length: 2.10 Km
   Number of stations: 2 + Depot + Park & Ride
   Estimated cost: € 150 million + VAT
   This metro line is an additional section in order to facilitate the connection with 1A National Road into a point where will be possible a “Park & Ride” facility. Estimated commissioning: 2015.

   Section from Gara de Nord to Gara Progresu
   Total length: 15 Km
   Number of stations: 20
   Estimated cost: € 1.008 million + VAT
   Estimated commissioning: to be agreed after the studies completion.
   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 Bâneasa, which will provide the connection with all existing metro lines in operation and future metro lines.

4. Metro Line 7 Voluntari – Bragadiru
   Implementation period: to be agreed after the studies completion.
   Total length: cca. 25 Km
   Number of stations: 30 + depot – 1;
   This metro line will be executed in order to increase the passengers’ mobility, currently using the SV – NE route. It will interconnect two of the most crowded and populated districts, crossing the downtown. The metro line will be in the service of the south-western Bucharest residential districts and the markets on the Ring road Alexandrei, as well as for 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).
5. Metro Line 3 Anghel Saligny - Preciziei, Extension from Păcii to the Western Ring road

<table>
<thead>
<tr>
<th>Implementation period:</th>
<th>after 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total length:</td>
<td>3,80 Km</td>
</tr>
<tr>
<td>Number of stations:</td>
<td>4</td>
</tr>
<tr>
<td>Estimated cost:</td>
<td>Euro 189,0 million</td>
</tr>
</tbody>
</table>

This metro line will be considered as the extension of the Metro Line 3, from Păcii metro station towards the hypermarkets area, residential real estates and A1 highway. There will be provided conditions for a Park & Ride facility at the Bucharest city exit from A1 highway.

6. Metro Line 2 Berceni – Pipera, Extension from Pipera; Pipera – Tunari Services and housing area

<table>
<thead>
<tr>
<th>Implementation period:</th>
<th>after 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total length:</td>
<td>8,20 Km</td>
</tr>
<tr>
<td>Number of stations:</td>
<td>9</td>
</tr>
<tr>
<td>Estimated cost:</td>
<td>Euro 650,0 million</td>
</tr>
</tbody>
</table>

The rapid development of Pipera – Tunari area, due to new residential districts building and near location to future highway towards Ploiești, will increase the transport demand that justify until 2020 the extension of Metro Line 2 Berceni – Pipera, from Pipera to Tunari.

Increase the metro network attractiveness by:

- Increasing the metro stations number (construction of 10 new metro stations) and new accesses opening of the existing metro stations, in stages, within 6 years from the financing source providing.

Modernisation of the existing installation on metro lines in service, by:

- Modernisation of obsolete fixed installation on the existing metro network whose life span was reached:
  - Ventilation installations, correlated with the involved electric installations. In stages, within 3 years from the financing source providing;
  - Sanitary installations. In stages, within 3 years from the financing source providing;

Rolling stock procurement

Within the strategy of S.C. Metrorex S.A is included the policy of providing the necessary rolling stock for operation, by replacing the old rolling stock fleet type IVA and subsequent procurement of new rolling stock for the envisaged new metro lines. The following criteria were taken into consideration.

- Increasing of metro attractiveness by:
  - Improving the amenities conditions for passengers and increasing the safety operation by purchasing metro trains of latest generation in order to replace the obsolete fleet;
  - Decreasing the headways between trains, once the transport demand will increase, and purchasing additional rolling stock;
  - Decreasing the operating expenditures percentage, optimising the energy consumption and the expenditures to purchase new rolling stock having improved technical and energetic parameters, more reliable in order to replace the obsolete rolling stock.

- Providing rolling stock for the new metro lines or for the extension of the existing ones correlated with the needs to cover the transport demand under safety traffic conditions.

- Providing a higher inter-operability degree of metro trains on current, new and new extension lines, to make flexible the operation and reduce the capacity and complexity of maintenance activity, by procurement of compatible rolling stock and providing the compatibility between fixed safety traffic installations on current or future lines.

- Currently, there are ongoing the procurement contract of 16 new metro trains and 16 ATC onboard equipments to replace the obsolete rolling stock fleet in operation. The first metro train is scheduled to be supplied at the end of 2013.