

ROMA



Comune di Roma



ROMA  
METROPOLITANE

Company for the construction of the underground  
railway lines in the city of Rome

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## The Organization

Roma Metropolitana bases its strategic values on **specialized know-how** in the field.  
The mission of the Company is strongly oriented towards **'governing' complex projects**.  
It is owing to these assets and a well-planned organization characterized by a base structure re-adaptable, as need be to suit projects undertaken, that this Company stands as a **centre of excellence** for the management of all matters concerning the planning and realization of new infrastructures that aid mobility in the city of Rome.

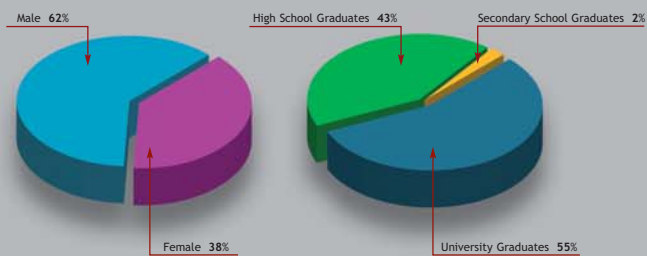
## The Team

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The main features of the **Roma Metropolitan Team** are:

- recruitment – external, targeted at candidates with **skills and experience within the sector**
- high-level components in **engineering** skills and **economic-judicial** fields

Total Number of employees 181



Average Age - 41 years

# The Company

**Roma Metropolitana** carries out, on behalf of the Central Municipality of Rome ("Comune di Roma"), all the tasks connected with the **accomplishment, extension and modernization** of the **underground** railway lines of the city of Rome, the **'Mobility Corridors'** and the **innovative systems of transport** including **cable-car** transport. Its tasks also include all other works, including all the relative and complementary works concerning **public transport with dedicated lanes**, to be carried out in the city of Rome.

Roma Metropolitana constitutes an enacting body of the **Municipality of Rome** that, being the **sole holder of the entire share capital**, exercises complete power, direction and co-ordination over the activities of the Company. "Comune di Roma" shall remain the **sole proprietor of the Company** until the final completion and delivery of the works assigned institutionally to the Company.

The rapport between the two parties is governed by a special **Covenant** approved under the Local Council resolution n°1 of 10th January 2005. With reference to the above-mentioned activities, and on the basis of the regulations laid down by the statute, Roma Metropolitana may:

- carry out activities involving **planning** of infrastructures and plants;
- carry out all the activities and functions as the **Sole Procedure Manager** and as the **Construction Site Manager** of the undertaken tasks by appointing its own adequately and appropriately qualified staff, in compliance with the norms;
- carry out activities of **Technical and Administrative High-Level Supervision**;
- act as the **Expropriating Authority**;
- carry out activities as **Contracting Authority** and act as the **Tender Procedure Manager**;
- arrange for all necessary **documents** relating to the Tenders, including all the relative deeds and documentation regulating such Tenders;
- draw up and enter into **agreement with bid winners**;
- arrange for all documents and deeds required for the **execution, prosecution and completion** of the works undertaken and, on behalf of the Municipality of Rome, impose **penalties/fines, cancel or extend contracts** and deal with all matters concerning the prompt, proper and complete execution of the works;
- address and settle, in compliance with the instructions issued by the qualified bodies of the **Municipality of Rome**, any **disputes** arising from the works, services or supplies contracted out.

On behalf of the Local Council Roma Metropolitana manages investments totalling approximately **9 billion Euros**, reserved for the mobility system of the city of Rome.

## Line C



**Line C**, the third underground line to be accomplished under the new General Town Plan of Rome, has been under construction since the spring of 2007 and represents the principal and most ambitious goal for **Roma Metropolitana**. The line will directly link areas and neighbourhoods that today are distant from each other, and will run across the city like a spine, **doubling the existing network**.

Line C is the most important infrastructure among the major projects listed under **'Strategic Infrastructures'** defined such by Law "21 dicembre 2001 n. 443 (Legge Obiettivo)" and the first to be put under construction.

The **'Main Section'** of Line C, stretching over a distance of more than **25 Km** with **31 stations**, starts from the "Clodio/Mazzini" area and heads towards the South-East, winding under the central part of Rome through S. Giovanni and then on to the inner suburbs along via Casilina and finally emerging onto the surface just outside the Ring Road (G.R.A.) following the tracks of the "Termini - Pantano" surface railway. The Line will end just outside the Eastern boundary of the Comune



di Roma. The **intersections** planned for the conjunction of the two **existing lines** of the Rome Metro system with the Regional Railway **FR1** and the future **Line D**, gain particular importance as regards the 'network effect' of the railway system.

The transport capacity of the system in the initial phase is estimated at **24,000** passengers per hour in each direction from "Clodio/Mazzini" to "Alessandrino", **12,000** from "Alessandrino" to "Grotte Celoni" and **6,000** between "Grotte Celoni" and "Monte Compatri/Pantano".

Line C will be the first **fully automated** underground railway line in Rome. The trains will be **driver-less** and 'platforms doors' will slide open simultaneously with those of the train on arrival, thus increasing safety and improving service with varying needs and circumstances.

The estimated cost of this project is around **3 billion Euros**, of which, **70%** will be subsidized by the State, **18%** by the Comune di Roma and **12%** by the Regional Council of Lazio.

### Time schedules for accomplishment, and the new "Clodio/Mazzini - Grottarossa" section

The first part of the new line to be put into operation in **2011** will be the **"Monte Compatri/Pantano - Parco di Centocelle"** section, followed by the **"Parco di Centocelle - Lodi"** section in **2012** and finally, in **2015** the **entire 'Main Line'** will go into operation. At that time, providing that all procedures of approval and financing flow within expected time limits, also the new **9 km** stretch of the line with **7 stations** will go into operation. This stretch of line leading from "Clodio/Mazzini" (the terminal of the main section) to "Grottarossa" via the "Auditorium" and the "Stadio Olimpico" areas, will ease the traffic along "via Cassia" which is one of the most congested roads in the city.

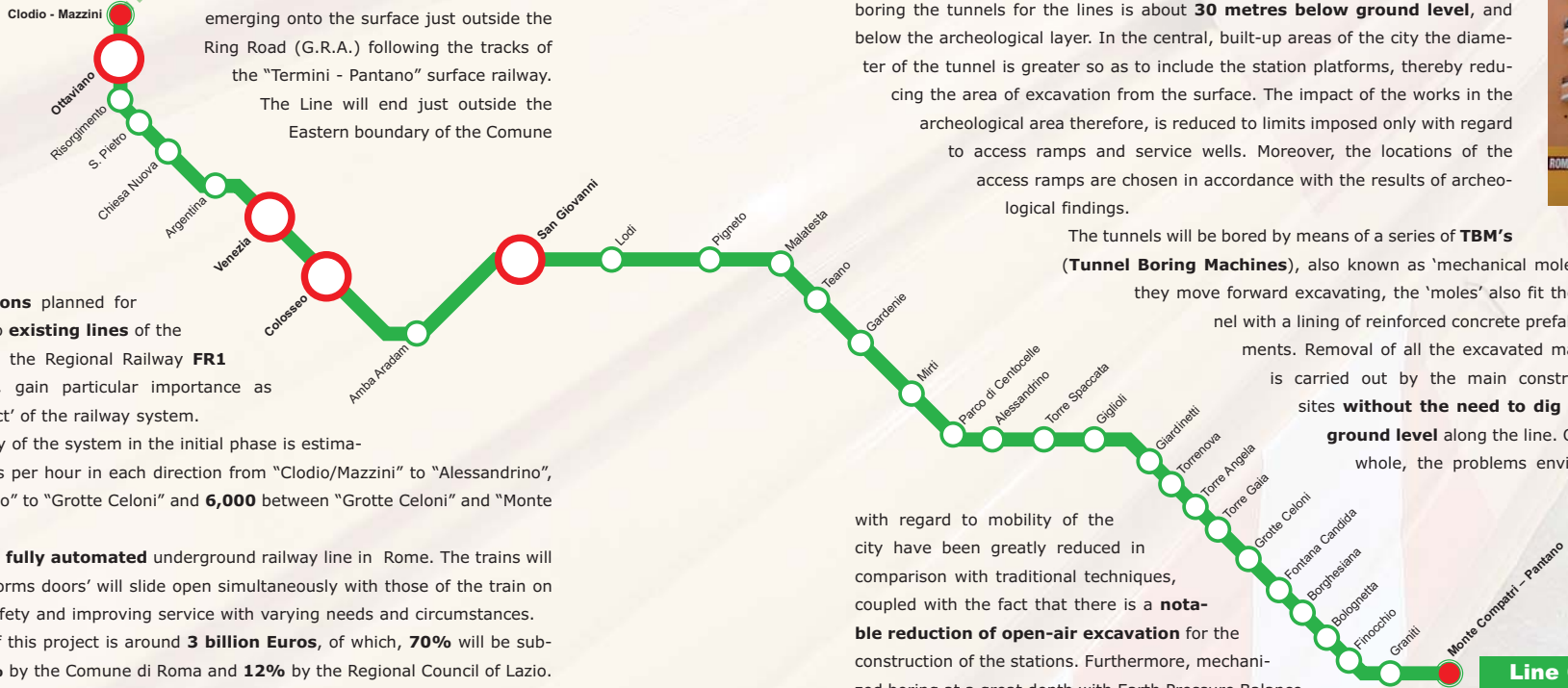
### Limiting the impact on the city

In comparison with techniques used previously for the construction of the existing underground lines, the technologies and criteria chosen for the construction of Line C will help contain the adverse consequences and effects of the construction sites on daily urban life, and greatly **minimize the problems linked with the local archeological findings, the environment and safety**. The depth for boring the tunnels for the lines is about **30 metres below ground level**, and below the archeological layer. In the central, built-up areas of the city the diameter of the tunnel is greater so as to include the station platforms, thereby reducing the area of excavation from the surface. The impact of the works in the archeological area therefore, is reduced to limits imposed only with regard to access ramps and service wells. Moreover, the locations of the access ramps are chosen in accordance with the results of archeological findings.



The tunnels will be bored by means of a series of **TBM's (Tunnel Boring Machines)**, also known as 'mechanical moles'. As they move forward excavating, the 'moles' also fit the tunnel with a lining of reinforced concrete prefabricated segments. Removal of all the excavated material is carried out by the main construction sites **without the need to dig up to ground level** along the line. On the whole, the problems envisaged

with regard to mobility of the city have been greatly reduced in comparison with traditional techniques, coupled with the fact that there is a **notable reduction of open-air excavation** for the construction of the stations. Furthermore, mechanized boring at a great depth with Earth Pressure Balance



## Line C



over the drilling face, **minimizes the risk of subsidence**

A great deal of attention has also been dedicated to a **study of the effect of the vibrations** on the monuments and buildings of the city, produced by the trains when fully operational. Analyses of such tests show that vibrations produced by the underground trains will be minor compared to those produced today by vehicles and road traffic in general. A **Techno-Scientific Committee** composed of world renowned University professors teamed up with project managers and planners provide high-level specialized consultancy for the protection and preservation of the UNESCO Heritage of the historical centre. The committee comprises experts in the fields of **engineering, geology, preservation and restoration**.

#### **Safeguarding and enhancement of the archeological heritage and monuments**

In the past few years, various **archeological surveys** have been carried out along the planned Line C. These surveys, have, since 2003, been included in an official joint programme between the main Local Council of Rome and the two **Regional Boards** of the Ministry of Cultural Heritage and Environmental Conservation in charge of the territory of Rome. **'The programme of activities regarding the historical monuments and archeological heritage linked with Line C'** has, therefore, become an integral part of the Preliminary Project outlining, generally, the **interventions and surveys** to be carried out, including the relative **costs**.

The collaboration with the authorities for the protection of the

archeological heritage represents on the one hand, an extraordinary opportunity for researchers to study in depth the history and background of the city, and on the other hand offers a guarantee that the construction of the line may highlight the heritage that comes to light. Portions of this heritage will be put on display in a large **museum area** connected to the "Colosseo" Station to be constructed under "via dei Fori Imperiali".



Other archeological exhibits will be displayed within the station areas and along the access passageways. Some of the artefacts will demand modifications in the projects of the stations. The current project, as a matter of fact, makes allowances for the construction of structures with the least impact on the archeological heritage. In some cases, the very position of access pathways leading into the stations may have to be altered or deviated following archeological surveys. In yet other cases, the artefacts or historical structures will be removed after careful and detailed study.

On the whole, archeological survey excavations entail movement of about **100,000 cubic metres of earth**.

Furthermore, more than **400 rock sampling tests** have provided a picture and readings of the stratigraphic column along the entire route of the 'Main Section'. Other excavations through archeological methods are also carried out during the excavation phases of the stations.

#### **The Stations**

Every station has been designed to have **no architectural barriers**. Along the access ways leading into and out of the stations, there will be escalators designed to 'transport' great numbers of passengers, and where possible, to and from street level. The materials, signposts and finishing will lend themselves to a standard **uniformity of reference and look**, not to mention **comfort**.



The surface structures have been specifically designed to fit harmoniously within the contest of the area surrounding each station.

In accordance with the specific instructions from the authorities of the architectural heritage and landscape of Rome, the location of the **access staircases** and the **towers** housing the lifts for the disabled at street level in the historical centre, are an issue of great importance from the point of view of the planners. Bearing in mind such issues, all the 'protruding' structures at ground level will be situated in locations that in no way deform the perception of the surrounding areas. The access escalators and steps/staircases at street level will be completely uncovered. As regards the stations of greater concern, the local authorities have demanded that the planning be carried out by **well-renowned professionals/experts**. The architecture of the stations outside the central area on the other hand, will be characterized by distinct architectural structures within the urban environment, offering those areas elements contributing to a face-lift of the areas.

#### **Supplementary and Compensatory Works**

The construction of Line C comprises a series of **supplementary and compensatory works**. Among such works, figures a **museum area of about 3,000 sq.m** under "via dei Fori Imperiali", linked with the "Colosseo" Station, where numerous artefacts discovered through archeological findings will be aptly displayed.

The project also comprises the **restoration of eight buildings of particular historical importance** and construction of **multi-storey car-parks** with a total capacity to hold 2,100 cars, **ground-level parking areas** with a total capacity to hold 1,500 cars, **pedestrian overpasses** and **road redevelopment plans** to facilitate access to some stations. A **new sports centre** adjacent to the "Teano" Station is also part of the project.

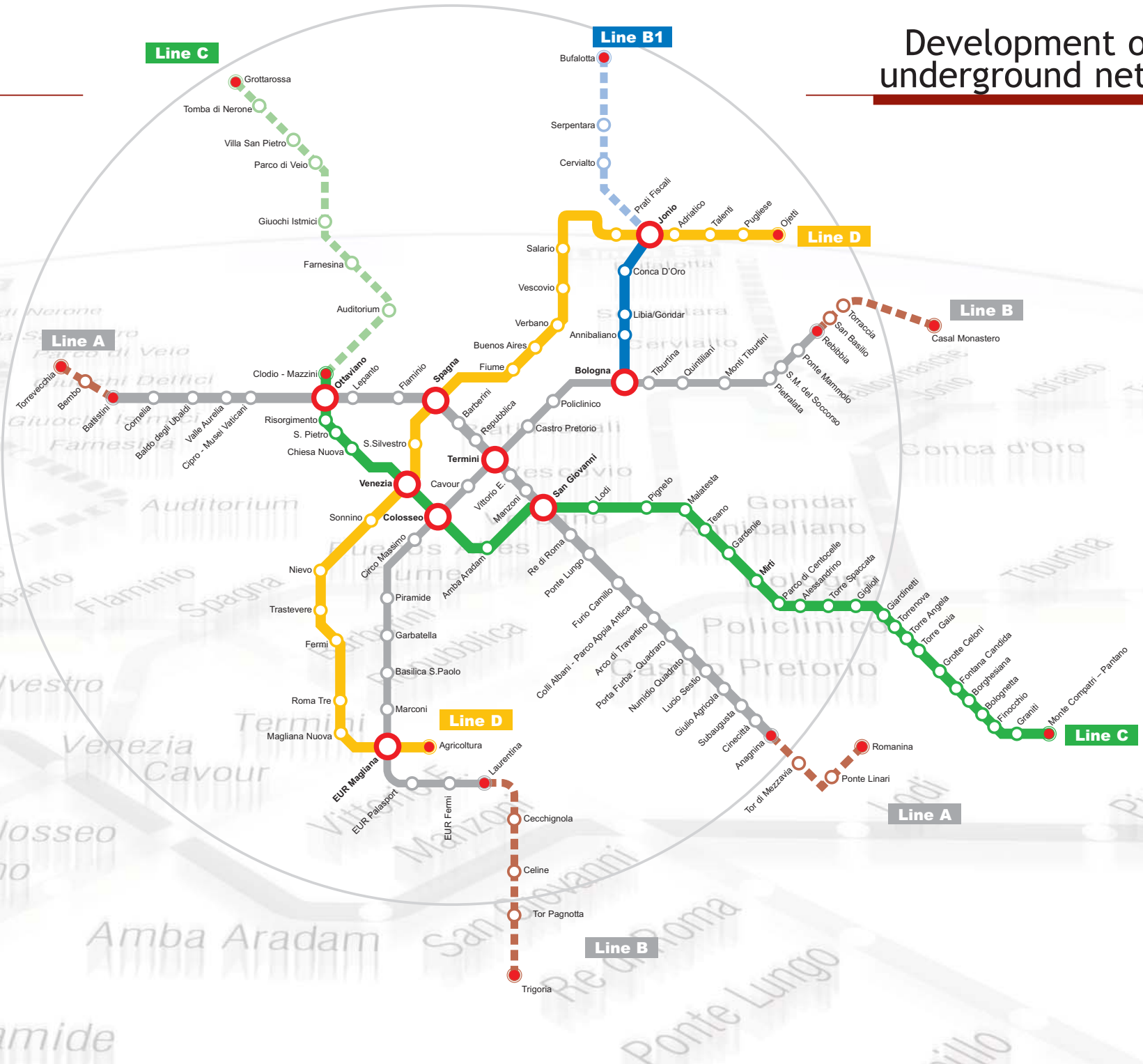
#### **Assignment to a General Contractor**

Following an International tender involving the participation of groups of leading companies, Roma Metropolitana assigned the task of completing the project plans and the construction of the Line to "A.t.i. Astaldi Spa - Vianini Lavori Spa - Consorzio Cooperative Costruzioni - Ansaldo Trasporti Sistemi Ferroviari Spa". The above-named Companies, along with CMB ("Società Cooperativa Muratori e Braccianti di Carpi"), constitute the project Corporate Company, "Metro C Scpa".

This corporate company assumes the role of the **General Contractor** for Line C in compliance with Law "21 dicembre 2001 n. 443 (Legge Obiettivo)".

Roma Metropolitana carries out the tasks of **Technical and Administrative High-Level Supervision**.

# Development of the underground network





**Line B1** of the underground system is a branch line of the existing Line B and extends from "piazza Bologna" to the ring road ("G.R.A."). Roma Metropolitana is currently in the process of building the "**Bologna - Conca d'Oro**" section, which is expected to be completed by **2011**; it is also carrying out the preliminary works of the "Conca d'Oro - Jonio" section. The construction sites were inaugurated back in **October 2005**. This section stretches entirely underground over a distance of about **5 Km** with 4 new planned stations: "**Annibaliano**", "**Libia/Gondar**", "**Conca d'Oro**" and "**Jonio**". Projects of the City Hall include plans for a **further extension of the Line** towards the neighbourhood of "**Bufalotta**" with a terminal in the vicinity of the "G.R.A.".

Line B1 will have a capacity to transport **24,000** passengers per hour in each direction. The catchment area covered by the line is the North-East part of Rome serving territories of the II, III and IV Municipalities, home to **half a million inhabitants** residing in the neighbourhoods of "Bologna - Nomentano", "Trieste - Africano", "Montesacro" and the so-called 'across-Aniene' area. The entire area is as vast as **the whole city of Bologna**, with all the traf-



## line B1

fic bottle-necking over just three existing bridges namely, "ponte delle Valli", "ponte Tazio" and "ponte Nomentano" that link the area with the rest of the city.

The new line will enable inhabitants of the North-East part of Rome to travel directly to the city centre or Eur, making up for the loss of thirty years, thanks to a Metro system that will be part of an expanding integrated public transport network. The **intersection with Line D** at "Jonio" station will enhance the 'network effect' of the railway transport system of the city of Rome.

The investment for the section of Line B1 already under construction is estimated at around **475 million Euros**, mostly subsidized by "Comune di Roma". The Ministry of Infrastructures and Transport made available about **240 million** for the entire "Bologna - Jonio" section, as laid down by "Law 211/92: Interventions for the sector of rapid mass transportation systems and further modifications".

The 'Integrated Contract' assigned by the City Hall Administration for the executive planning and the accomplishment of the works of the "Bologna - Conca d'Oro" section of the Line is being carried out by "A.t.i. Salini Costruttori Spa - Maire Engineering Spa - Icop Spa - TPM





Srl". Roma Metropolitana has the role of **Sole Procedure Management** and **Construction Site Management**. In 2007, the Mayor of Rome, invested with **special power** by the government to address the emergency of traffic and pollution in the city, inserted the "Conca d'Oro - Jonio" section including a series of supplementary and complementary works in the list of the **tasks to be addressed with urgency**.

In order to achieve full functionality of the complete Line, there will be constructed **interchange parking areas** for about 1,000 cars in the vicinity of the stations, a **car/bus-metro interchange hub** at "Conca d'Oro" and a **footbridge with a cycle-lane** over the Aniene river between "Pratone delle Valli" and the neighbourhood of "via Val d'Ossola".

### Construction Options and Safety

The entire operation of construction has been studied in detail with the aim of **reducing to the minimum the negative impacts** of the works on the daily life of the citizens. One of the main characteristics of the project is the **detailed planning of the space occupied by the construction sites** with the implementation of **new public and private mobility schemes** with the least amount of inconvenience.



The metro tunnels, in their entirety, will be dug **at a depth of approximately 30 metres** under the earth's surface by means of **TBM's (Tunnel Boring Machines)**, taking up no space at ground level. As these machines move

forward digging the tunnel, they simultaneously fit the tunnel with a permanent lining of reinforced concrete rings. Special technology of the **EPB (Earth Pressure Balance)** enables the TBM to advance with the

application of counter pressure on the drilling face utilizing the excavated earth itself. The sequence of tasks is performed in a way as to **avoid any hazard or hindrance to existing buildings**.

Considering the pondered choices made with regard to the depth of the Line, the stations will be **spacious, modern** and **fully accessible**. The location sites of the stops and access

points has been studied according to criteria of quality and functionality, to increase as much as possible the flow of passengers to the stations and to ease interchange with other means of public transport.



From the point of view of **safety** both, the depth of the tunnels, and the techniques chosen for construction of the stations are perfectly compatible with the existing buildings and structures.

On the basis of more than **130 technical surveys** already carried out along the track and in just as many buildings/structures, efforts are being made to draw up official and legal documents declaring **the 'actual state' of all the buildings** adjacent to or in neighbouring areas of the works, so as to establish their characteristics and condition before any work is begun.

Among detailed geo-diagnostic surveys carried out along the entire line, **160 surveys under the ground, adding up to about 4,500 metres of drilling** have been carried out with analyses performed on the spot, in laboratories or with instruments, to study the underground waters and gain full knowledge of the **geological nature** of the earth in the work areas.

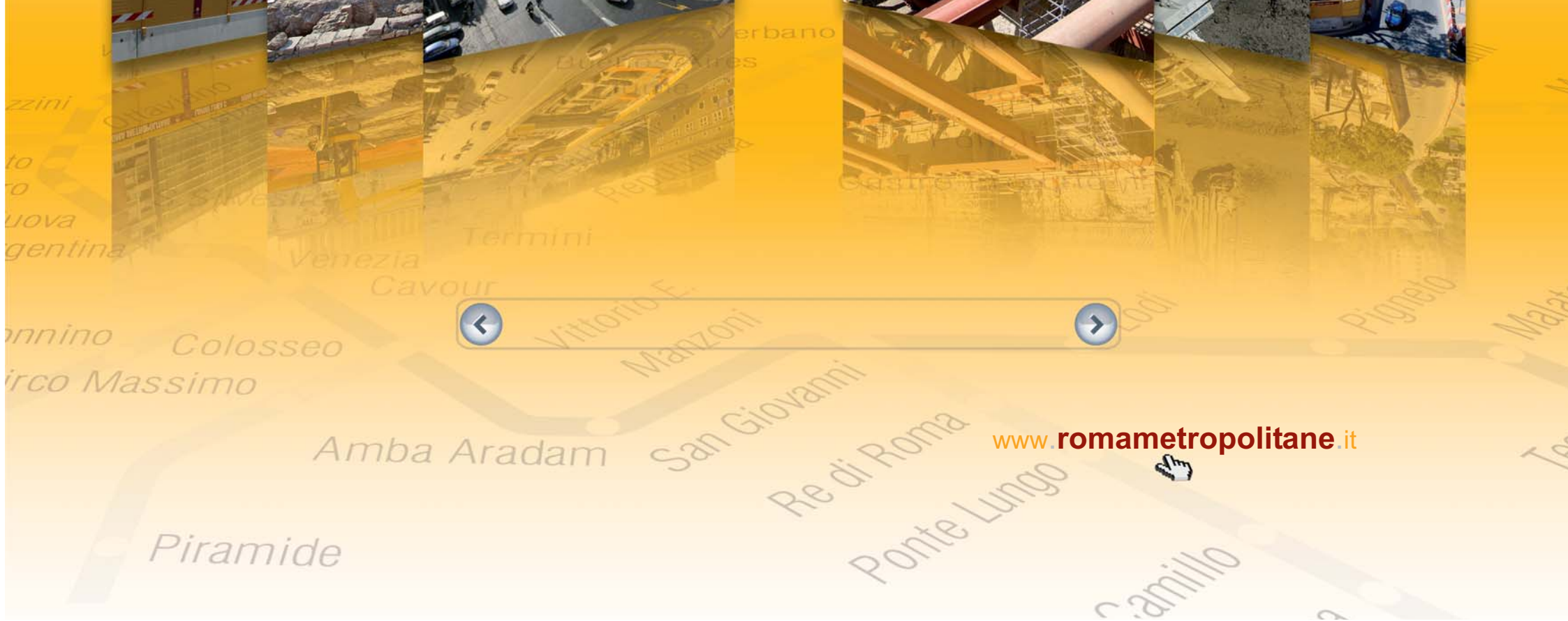
Before work begins on any site, further surveys in the subsoil are carried out on each single site in order to **eliminate all risks of interference** with any underground cavities. The existing sewer system, already previously inspected, is **further inspected** before the execution of the excavations, in order to ascertain and eliminate leaks or any other risks.

Other surveys, by means of **archeological techniques**, have been conducted on all the sites indicated by the State archeological authorities. Where need be, on specific requests of such authorities in charge, further inspections are conducted through the course of the works on the various sites.





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**The New General Master Plan**, with a view to metropolitan characteristics for the city, has set out plans for a public transport network based on four main transport lines.

Line D, which extends from the "Agricoltura" terminal in the south to "Ojetti" in the North-Eastern sector of the city, has the task of **linking consolidated areas of the city**, some of them including dominant service sectors and others residential. The line will thus create a link between the historical centre of the city and neighbourhoods as "EUR", "Magliana", "Marconi", "Trastevere", "Salario", "Montesacro" and "Talenti".

## line D

Moreover, to the south, beyond the terminal of "Agricoltura", there are plans for the future extension of the line towards "via di Grotta Perfetta".

Line D therefore becomes part of the public transport network with **connection points** linking it **with the other underground lines and with the regional rail services**.

In the historical centre, in fact, Line D closes the 'grid' consisting of the four metro lines and forms connection points with Line C at "Venezia" Station and with Line A at "Spagna" Station. Furthermore, Line D links up with Line B and the "Roma - Lido" railway line at "EUR Magliana" and even with Line B1 at "Jonio" Station. At "Trastevere" and "Salario" stations, Line D links up with the Regional surface railway lines and the line to Fiumicino International Airport.

### Project Financing

In order to establish the most appropriate form of financing for the works, stimulating the interest of private capital, the Municipality decided to launch the construction of Line D by resorting to the **Project Financing** procedure.

In accordance with this procedure, Roma Metropolitan invited techno-financial proposals from the market for the purpose of granting the Concession for the construction and the management of the operational transport service, supplying also a detailed **feasibility study** conducted by its own technical team.

In March 2007, the Local Government Body, accepted the offer made by "A.t.i. Società Italiana per Condotte D'Acqua Spa - Impresa Pizzarotti & C. Spa" deeming it as the most appropriate

in the 'public interest', and therefore nominated the above mentioned group as the "**Promoter**".

The **Concessionaire** to be assigned the task of constructing the Line and running the service on behalf of the Municipality in accordance with the legal procedures, will be selected through a **Tender Procedure** based on the project drawn up by the Promoter. The latter will have the right to exercise **pre-emption** and obtain the right to the Concession, but only under conditions most favourable to the Municipality, resulting from the procedures of the tender.

The **Concessionaire** will assume the task of conducting precautionary investigation (archaeological, geological, etc.), developing the final and executive plans of the works, constructing the line and providing full operational service throughout the contracted period.

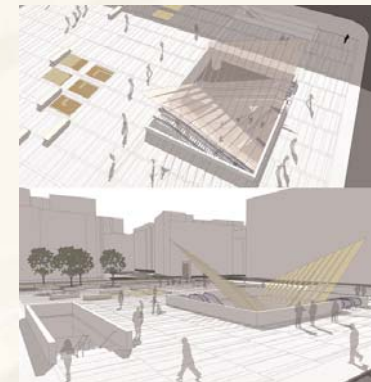
In carrying out these tasks, the Concessionaire will bear the following main risks:

- **'construction risk'**: guarantee completion of the works within the established time limits, at the estimated costs;
- **'transport offer related risk'**: throughout the contracted phase (esercizio), provide the required standards of service (frequency of trains, functionality of the installations, etc.), set out in the agreement that regulates relations with the franchising Administration Authority.

The proceeds from the service (ticket sales and season tickets) and consequently the **'demand risk'**, shall be handled by the Municipal Administration which will continue to manage, independently from the Concessionaire, the revenues generated by the "Metrebus" system.

The burden for the Municipality, assessed on the basis of the investment necessary to complete the works and on the conditions envisaged for contracting out the management, is mainly represented by:

- **'subsidy towards construction'** to be paid to the Concessionaire during the planning and construction phase, in connection with the "S.A.L." (state of advancement of works);
- **'service availability fee'** (payment for the running of the service), to be paid through a system of premiums and penalties based on the quantity and quality of the service provided.



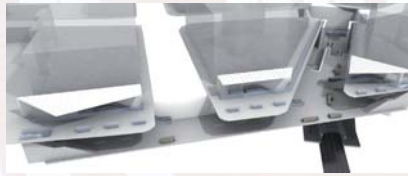


Such payments will be made to the Concessionaire through the phase of management of the infrastructure over a contractual period of **20 years**.

Through the construction phase, in order to attain completion of the execution phase, the Municipal authorities will be required to commit even the so-called 'available funds' (technical costs to the Contracting Authority, High-Level Supervision, unforeseen hitches and provisions of Law).

The **estimated cost** for the construction of Line D amounts to approximately **2,630,000,000 Euros**, 65% of which will be required for only the "Fermi - Prati Fiscali" section.

The **total estimated investment**, including the 'available funds' and VAT, equals to about **3 billion Euros**. The burden of the 'service availability fee' at the expense of the Municipality will be partially offset by revenues generated by the fares imposed on the lines.



### Main features, system technology and construction techniques

The total length of Line D is **20.4 km**, with **22 stations**. The provision of transport on weekdays in the two directions, will be more than **800 runs per day**, expected to carry an estimated total of **400,000 persons**.

The Project Financing operation aims to complete the entire line from "Agricoltura" to "Ojetti", but will carry out the work **in successive phases**, establishing as the initial target, the construction and implementation of the first functional section defined the "**Priority Section**" which goes from "Fermi" Station ("viale Marconi") to "Salario" (at the intersection with "via Salaria") covering a distance of **11.5 km** with **12 stations**.

The Priority Section meets the principal aims of Line D, in that it completes the grid of underground lines, it serves the historical centre, offers interchange with the main railway lines and provides extra transport in heavily-populated and consolidated neighbourhoods that are not served by the other lines.

The location of the depot, which makes operation of the Priority Section and the entire line possible, will be an area made available by "RFI Spa" within 2010, in the railway parking area of "Roma Smistamento" (Rome Shunting area of "via Salaria"), in virtue of a broader **mutual protocol** signed in 2006 by the Lazio Region, the provinces of Frosinone, Latina, Rieti, Rome and Viterbo, the Municipality of Rome and by "RFI SpA" itself.

The expected travel demand on Line D on an average working day is of around 420,000 persons. The system is designed to transport with great ease, in optimum performing conditions,

an estimated **20,000** passengers per hour in each direction.

Even in the rush hours the service will maintain **high levels of performance and comfort**, as the trains will have a capacity of 800 seats and there will be a high number of convoys running through at a frequency of up to **90 seconds** between two consecutive convoys in the rush hours, thereby ensuring an acceptable index of crowding even at the most critical times

of the day.

The reduced carrying capacity of the trains, made possible by the planned higher frequency of trains in operation, will help contain the dimensions of the stations structures and consequently, the environmental and archaeological impact of the works to be carried out.

The system technology of Line D, just as in the case of Line C will be based on **full automation**, with driver-less trains and 'platforms doors' that will slide open simultaneously with those of the train when it arrives.



Full automation will allow, on a daily basis, to dynamically control the frequency of passage of trains according to real needs of the service. Manoeuvring of the number and movement of the trains in service will be controlled from a 'Control Centre' known as the Central Supervision Post (CPS) for the whole of Line D.

The tunnels will be fully dug with the aid of underground mechanized excavators called TBM's (**Tunnel Boring Machines**), without occupying any space at ground level or putting at risk the stability of the surrounding ground.

In the city centre, the line will drop to a depth of approximately **40-50 metres** considering its passage below Lines A and C and the construction of the relative connecting stations, while in areas on the outskirts of the city, the depth of the tunnel will be reduced to about **20 metres**, limiting in any case, interference with any archeological layers.

The basic construction scheme (**single tube** with two-way tracks and relative stations located particularly in **adequately spacious urban areas**) will allow accomplishment of the line with a relatively low impact.

The placement of the tunnels running under and along the main roads, and the wide spaces in the urban areas where the stations will be located, also offer the opportunity to limit interference with existing buildings or structures.

### Deadlines for Accomplishment

The Preliminary Project drawn up by the Promoter, following qualified evaluation on the part of the competent Municipal authorities and other bodies concerned (State superintendents, Ministry, Lazio Region), will form the basis of the bidding aimed at selection of the Concessionaire.

The Concession period is scheduled to begin **in the year 2009**, with the aim of consolidating completion and implementation of the **Priority Section** between "Fermi" and "Salario" **within 2015**.

Depending on the necessary forthcoming financial resources, the works on the **entire line** from "Agricoltura" to "Ojetti" could well be completed by **2019**.

On expiry of the Concession that starts with effect from the implementation of the Priority Section to public service with a planned duration of **20 years**, the Municipality ("Comune di Roma") will again come into possession of the infrastructure and will have the right to all operations of the service directly, either through one of its own Companies or may even propose invitation of tenders in order to select a new company to run the service on its behalf.



# The activities of Roma Metropolitane



Eur-Tor de' Cenci and Eur-Laurentina-Tor Pagnotta-Trigoria Corridors



# Upgrading of the “Termini” Station Hub

**Upgrading of the Termini Station Hub** as a connection point between Lines A and B of the Rome underground system, involves an **overall renovation and optimization** of its features, with a view to functionality and performance.

The operations are included in the programme prepared by the Mayor of Rome in the role of Delegated Commissioner for the emergency of traffic and mobility in the city.

The planned works involve the upgrading and optimization of the **station installations and safety**, elimination of all the **architectural barriers**, construction of structures that will increase the **interchange potential** and improvement of the **distribution of the flux** of passengers aimed also at facilitating **evacuation in case of emergency**. These works also include **redevelopment** plans not only for the **interior part of “Termini”** station, but also for “piazza dei Cinquecento” that lies above the station itself.

The targets of the operation may be summarized as follows:

- **upgrading, re-organization and rationalization of the routes** aimed at reducing congestion, obstacles and clashes that today are evident, particularly in the interchange pathways from Lines A to Line B;
- compliance with the prescribed **norms on fire safety**;
- overcoming problems related to **architectural barriers** and improvement of the features at and around the points of access to the stations, with particular regard to users with reduced physical and visual capacity;
- general **installation and technological restructuring**;
- **refurbishment of the finishing and trimming**.

The main feature of the project with regard to functionality is the plan to **separate the inbound flow of travellers from that outbound**, through re-organization of all the internal pathways and passageways, above all through the construction of a **new pathway** linking the platforms of Line A, the under-pass, and platforms of Line B. The outbound flow of passengers from Line A will thus be doubled. Simulation tests carried out, revealed in fact, the flow in this area to be the most critical among all the internal passageways. The new tunnel is planned to be constructed at a depth **below the archeologically rich layers**.

In addition, in functional terms, there are



plans for the **mechanization of all the passageways** and paths linking the different levels, by means of new escalators replacing the existing ones and installation of new lifts that will enable users with reduced physical capacity to access the various levels of the Hub.

From a technological point of view, there are plans for the installation of a series of plants such as smoke extractor **plants**, air barriers and fire-extinguishing installations which, along with the use of fire-resistant materials and building components, allow to fully comply with the

fire safety norms in force.

As regards the architectural image, the aim of the project is to renovate the finishing without distorting the consolidated image by focusing on a **cautious use of materials, signposts and proper criteria of illumination**.

Therefore, the solution opted for with regard to the Line B station, is that of restoration and conservation of the existing spaces and materials, while as regards the Line A station, the best option is the redevelopment of the whole area with renovation of the finishing and trimmings utilizing **the most modern, high quality and valuable materials** resistant to fire, vandalism and exceptional mechanical properties against wear and tear.

Some works have been scheduled also for the **redevelopment of the area of “piazza dei Cinquecento”**:

- refurbishment of the existing footpaths, including those of the Bus Terminals which are at present extremely uneven;
- resurfacing of the road surfaces for vehicles and pedestrians along with the use of appropriate distinguishing materials and colours;
- construction of a new pedestrian crossing perpendicular to bus-stops, to be located at the front of the Terminal of each line;
- demolition and reconstruction of the structure situated in the middle of “piazza dei Cinquecento” that forms the entrance to Line B.

The project includes finally, an accurate study of the construction sites and the construction phases, which constitute a particularly critical aspect of the project considering the fact that all the works will be carried out **while the services are in constant use**, with the minimum amount of inconvenience. The investment for this project is estimated to be approximately **63 million Euros**.

## Extension of the existing Lines

**The Municipality of Rome** has a series of further plans for the extension of the existing Metro Network, especially for:

### Line A

- with an extension to the **West**, of about 2 km running beyond “Battistini” to “Torrevecchia”, with 2 stations and a parking area to facilitate interchange at the Terminal.
- with an extension to the **South-East**, of about 2.5 km stretching from “Anagnina” to “Romanina”, with 3 stations and a parking area to facilitate interchange at “Ponte Linari”, beyond the Ring Road (“G.R.A.”).

### Line B

- with an extension to the **Nord-East**, of about 3.8 km going from “Rebibbia” up to “Casal Monastero”, with 3 stations and a parking area to facilitate interchange in the vicinity of the Ring Road (“G.R.A.”)
- with an extension to the **South** of about 6 km from “Laurentina” up to “Trigoria”, with 4 stations and an interchange Hub in an area in the vicinity of the Terminal.

# Public Transport 'Corridors'

**Roma Metropolitana** is in the process of building new infrastructures which will be an integral part of the transport network system along with railways and traditional public buses. The New General Master Plan has established that the so-called '**Corridors for Public Transport**' are an important component of the system of mobility in the city.

These 'corridors' represent areas **reserved for collective transport** both, under the present and future road network, along high-frequency routes not currently served by Metro lines or Urban Railways.

The road surface of these special bus lanes, not to mention the pedestrian areas linked to the lines will be built and fitted with distinct structures appropriate to a modern public transport service.

The aim is also to adequately equip the lanes so as to make them suitable as a means of **medium capacity** surface public transport service with a good performance rate at 'commercial speed', high frequency of buses guaranteeing shorter waiting times, not to mention comfort and the **absence of polluting agents**.

Roma Metropolitana has completed the **Preliminary and Final planning** of these tasks, and has been entrusted the role of **Tender Procedure Manager** for both these tasks included in the programme ordered by the Mayor with the power of Delegated Commissioner for the emergency of traffic and mobility.

The first intervention concerns the construction of the "**Anagnina-Tor Vergata**" corridor covering about **8 km with 10 stops** and a terminus connecting it to the Terminal of Line A at "Anagnina", which will also serve as the main connecting point to the new Sports Village ("**Città dello Sport**" - in the "Tor Vergata" area). Plans are to implement the service **in the beginning of 2009**.

This corridor provides special **bus-lanes that are protected** in the most critical sections of the selected routes. Furthermore, there are plans for the **redevelopment** of the neighbourhoods served by the service, through creation of a '**linear park**' that will

be partly paved and partly green particularly with structures of a recreational nature.

Finally, the project provides for a **complete re-organization** of the system of **bus-stops (parking system)**. The total investment cost, inclusive of purchase of new 18-metre environment-friendly buses by "ATAC" amounts to about **23 million Euros**.

The second task concerns the creation of a Transport Network including **fixed installations for electrically-powered buses** in the neighbourhoods of "**Eur-Tor De' Cenci**" and "**Eur-Laurentina-Tor Pagnotta**", with plans for a future extension leading up to "**Trigoria**".

In its full configuration, the network will stretch over a distance of **44 Km** in the overall development of the routes suitably branching out to ensure an effective coverage of the territory, with about **80 stops**. The project includes construction over 18 Km, of an **infrastructure for trolleybuses**.

The technology for the trolleybus system is characterized by vehicles with dual-mode operation: **electrically powered** with power supplied by means of overhead wires, and powered also by a **diesel engine** to run independently. The route, located wherever possible within **protected bus-lanes** is compatible with the transit of normal buses. The project also provides for

the redevelopment, with appropriate installations, of the bus-stops along the routes not equipped with installations for electrically-powered vehicles.

Additional plans for complementary works include construction of **3 parking areas** to facilitate interchange.

The total investment cost of this project is approximately **225 million Euros**.

## The Magliana Cableway

**Roma Metropolitana** will moreover, create an aerial cableway, suspended over the River Tiber to link the "**Eur Magliana**" Station of Line B and of "Roma - Lido" Railway to the "**Magliana**" neighbourhood (with an arrival station in the vicinity of the school "Otto marzo").

The infrastructure will enable inhabitants of the "Magliana" area to reach the existing Metro network pending completion of the planned Line D and will also create a **direct link between the districts of "Eur" and "Magliana"**.

Similarly to the infrastructures widely in use in the Alpine and Tourist areas but which are however, making an impact on urban environments (as in the case of the 'Aerial Tram' of Portland and New York), this system of transportation offers the following advantages: **low atmospheric and acoustic pollution**, made possible through the use of electric motors; occupation of limited land territory, restricted to the area surrounding the stations and the supporting towers; transport velocity of 8 metres per second, equivalent to 28.80 km/h, in other words a **greater 'commercial speed'** compared to buses and trams; **rapid construction**; **lower costs of construction** in comparison with other public transport infrastructures; **option of dismantling**, and where necessary, re-assembling the system in a different location. The type of cableway decided upon, is one defined technically as the 'come and go twin-track with independent lines'. This system, which is already in use in some Italian and European installations, is composed of two cable-cars, each of which moves on two cables. Each cable-car runs independently from the other thus constituting **two separate structures**. The cable-cars stop in the stations allowing easy access to passengers with reduced physical capacity or those with wheelchairs or bicycles.



The route is estimated to be approximately **700 metres long**. Along the course, there will be placed only one support structure for the line in the vicinity of the "Magliana" fly-over and will reach a maximum altitude of **40 metres from the ground**.

The overall time per cycle expected to be approximately **215 seconds**, equivalent to 16-17 trips per hour will guarantee transport of **2,200** passengers per hour in each direction. The planned frequency of the passage of the cable-cars will be in synchrony with Line B currently in operation (a train every 270 seconds in the rush hour).

The investment cost of this project is estimated to be approximately **15 million Euros**.



