



## MASS TRANSIT SYSTEM FOR METROPOLITAN JERUSALEM

### Jerusalem Light Rail – Mass Transit System

**Jerusalem is ahead of all other Israeli cities in developing a new traffic system, at the heart of which is the Light Rail Transportation system. The project will relieve traffic congestion in the city and will stimulate rehabilitation and renewal in the downtown area. Work on utilities is already underway and the system is expected to begin operating in 2007.**

All phases of the project's planning and approval have been completed, and the final stages of contract negotiations are in progress with the group that won the international tender for constructing and operating the system, under a BOT (Build-Operate-Transfer) format. The public sector is now completing work to relocate and move utilities along the route of the first LRT line, ahead of the construction to be carried out by the Concessionaire.

#### **A 100 year-old idea is realized**

In 1902, Herzl's well-known book *Altneuland* was published, in which he describes the future of Jerusalem, a city that was only just beginning to venture outside the walls of the Old City. Herzl, who was quite familiar with the European "tram" cars, envisioned "modern neighborhoods with electric lines, tree-lined boulevards... a metropolis of the 20<sup>th</sup> century." One hundred years have passed and Jerusalem has developed beyond recognition, but Herzl's electrical vision (or "light rail system," as it is presently known) has not yet arrived. The concept was only raised once again in 1995, after traffic congestion turned the city center into one huge crowded, noisy and polluted traffic jam, causing pedestrians, residents, business-owners and their customers to flee.

#### Jerusalem Transportation Master Plan Team – Light Rail

- Established in 1994
- Joint body for the Ministry of Transport and Jerusalem Municipality
- 25 employees
- Budget (2003) - NIS 205 million



### 1994 – The Birth of the Project

In 1994, the Jerusalem Transportation Master Plan, jointly administered by the Ministry of Transport and the Jerusalem Municipality, was charged with finding a solution that would address the city's transportation problems and bring about urban renewal. The planning goals were:

- To encourage use of mass transportation;
- To promote operational efficiency and economic feasibility;
- Renewal and development of the city center;
- To reduce noise and air pollution;
- To bring pedestrians and businesses back to the city's center;
- To relieve traffic congestion throughout the city.

The project staff, in conjunction with leading international companies, thoroughly examined and studied all possible alternatives. The solution that was found to be most appropriate for Jerusalem was a system based on light rail transportation (LRT), with buses that would travel along exclusive, high-speed arterial bus lanes. The new system combines feeder bus lines, "park and ride" lots, and traffic and parking arrangements that give priority to public transportation and encourage its use.



### **1997-2000 – Getting On Board**

Preliminary planning for the system was completed during 1997-1998. Economic aspects were examined and the plan was submitted for approval by the planning bodies. In 1999 the government approved the plan, and the project was underway. In 2000 an international tender was issued for preliminary qualification (PQ), and four groups responded to the bid to construct and operate the first line of the system for a period of 30 years. The tender was formulated as a BOT format, which provides the means for building and operating public projects.

### **2001 – Work on utilities begins**

While planning was going on, work was undertaken to prepare utilities and infrastructures. According to the terms of the bid, the public sector assumed responsibility for providing the Concessionaire with a suitable route free of underground utilities, in addition to its overall responsibility for planning, statutory approvals, evacuations and expropriations.

Work on utilities began in 2001 at the two terminus points of the route (Pisgat Ze'ev and Mt. Herzl), and proceeded in the direction of the downtown area. Utilities work will be completed in 2005, which is when the Concessionaire begins its construction work. The Concessionaire will be responsible for laying the tracks and the electrical feed system, building the control and maintenance center, transportation stations and, naturally, the planning, manufacture and operation of the 23 trains that will operate along the first line. To date, the Ministry of Transport and Jerusalem Municipality have invested some NIS 900 million in the project. In addition to work directly related to the LRT, the project is also involved in upgrading the public space and beautifying the city along the route, primarily in the downtown area. .

### **2004 – Choosing the Concessionaire and completing preparatory work**

The Concessionaire was chosen in 2002 – the CityPass Consortium, comprised of Connex Transport AB (from the international Vivendi Group), and renowned train manufacturer Alstom; and two Israeli companies: Ashtrom Construction and Infrastructures, and Pollar Investments. CityPass undertook to build the first line, and to operate it for a period of 30 years in accordance with the terms defined in the agreement with the government. Work by the Concessionaire is slated to begin in 2005, and the inaugural trip along the LRT system is expected to take place in late 2007.



## **Work being carried out by the Transport Ministry and the Jerusalem Municipality**

### ***Moving utilities***

The LRT will operate along a MTL (mass transit lane), which must comply with the highest standards for safety and reliability. In order to ensure that the system operates continuously and without disruption, all utilities must be removed from underneath the MTL: water, electricity telephone and sewage lines. These utilities are moved to other parts of the road, and beneath the sidewalks. As work was progressing, new pipes were laid, and where necessary old infrastructures were upgraded and replaced. The project included moving utilities, evacuations, and paving new lanes to the extent of NIS 400 million.

### ***Evacuations and widening streets***

As part of the work to widen Jaffa Road, some 180 properties were evacuated. The expansion of the street went a long way to improve the look of Jerusalem's main street, making it a well-lit, pleasant and pedestrian-friendly thoroughfare.

### ***Historic reconstruction and preservation***

The Mass Transit Project, working together with the Council for the Preservation of Historic Sites, documented and preserved buildings and architectural elements of historic value, either by preserving original elements or via reconstruction that was completely faithful to the original.

## **New traffic network in Jerusalem**

The LRT is a major component in the overall systemic solution, which combines public transportation to and in the city, private vehicles, pedestrians, "park and ride" lots, new traffic and parking arrangements, and a network of traffic arteries and ring roads. The LRT is the "backbone" of the plan, representing a totally new concept with regard to transportation in Jerusalem. The new system creates a transportational ranking system with regard to those using the public space, and gives priority to pedestrians and people using public transportation over private cars.



### **MTL (Mass Transit Lane)**

At the heart of the system is a network of arterial mass transit lanes (MTL) along the city's main routes. The first MTL will connect Pisgat Ze'ev with Mt. Herzl, via Jaffa Road, and the LRT will soon use these lanes. The second MTL will go from Hebron Road via King George, Strauss and Yehezkel Streets, to the Har Hotzvim industrial park, and will be used by high-grade buses and later on, by the LRT. Construction of additional MTLs are planned throughout the city as part of the mass transit network.

### **Advanced technology on buses, too**

During the first phase, along with the light rail system, there will also be high-grade buses (HGB) running on the blue MTLs. The HGB has a high passenger capacity, a quieter and cleaner engine, and a low floor. Within and between the different neighborhoods, "feeder" bus lines will operate small and medium buses bringing passengers to the LRT stations. Shared stations, coordinated schedules and uniform ticketing will enable people to transfer quickly and easily between the different types of transportation.



### **Interurban transportation and "park and ride" lots**

LRT stations will be located near the central bus stations, the interurban train stations and at the entrances to the cities. Adjacent to the stations there will be "park and ride" parking lots. Various types of "combination tickets" will enable people to use interurban and urban public transportation, the parking lots, and the LRT system.

### **Traffic and parking arrangements in the city center**

New traffic and parking arrangements will help reduce congestion in downtown Jerusalem and will encourage use of the LRT. The number of parking spaces in the city center will be drastically reduced, as will parking for new projects to be built adjacent to the stations. The city center will be surrounded by an internal ring road that will provide access for residents, business-owners, can be used for loading and unloading goods, and will reduce the amount of traffic crossing through the city.

### **Zahal Square and the underground tunnel**

The project includes a tunnel extending from the Damascus Gate to the Jaffa Gate, underneath Zahal Square. The purpose of the tunnel is to relieve vehicular traffic between the northern and southern parts of the city, leaving the aboveground level along Hatznhanim Street free for the LRT, which will operate along the Old City walls.

Above the tunnel, where the old city meets the new city and adjacent to the Jaffa Gate and the ancient walls, a plaza will be built for the city's residents and its visitors. The new plaza – to be planned by architect Moshe Safdie – will include a small amphitheater, which will be used as a place for meeting and observation, and a guiding point for tourists. The plaza will be landscaped with various types of plants and foliage, while carefully protecting the historic nature of the surrounding area.



כוכב צה"ל

## Revitalizing the city center

One of the project's main objectives is to revitalize the center of Jerusalem, which has suffered from ongoing deterioration: residents and businesses that formed the basis of the downtown area have been fleeing the city since the 1990s, and the establishment of the Malha Mall only accelerated the process. All that remains in the city are mostly relatively weaker populations and small businesses. Jaffa Road, which was once the city's major street, has become crowded, noisy and dirty, and no longer attracts shoppers or those seeking entertainment.



Concomitant with the construction of the LRT, the city is carrying out a series of projects to upgrade the public space throughout the downtown area. Jaffa Road, from the Generali Building to the Mahane Yehuda market, will become a paved and enjoyable pedestrian mall, and only passengers and the LRT will be permitted to use it. Traffic will also be restricted along other parts of the street, in order to restore Jaffa Road's beauty and public function.

The Jaffa Road Pedestrian Mall will join the Ben-Yehuda / Nahalat Shiva compound, as well as other compounds in neighborhoods such as Even Yisrael, and together they will comprise a pedestrian-friendly area and a center for commerce, entertainment and social gatherings.

## The first line

After examinations and comprehensive surveys the route of the first line was decided, which will bring immediate relief to the traffic congestion in the city, especially downtown, and will serve a large number of users. The line will be 13.8 km. long, from Pisgat Ze'ev to Mt. Herzl, via Jaffa Road, most of which will become a pedestrian mall. There will be 24 stations along the route, and at peak hours trains will run every four minutes. When the line is extended to Neve Yaakov in the north and Ein Kerem in the south, the line will be 22 km. long.

## Extending the line

At the request of the Transport Ministry, the project engineers have initiated a process to approve extending the first LRT line to the Neve Yaakov neighborhood in the northern part of the city; and to the Kiryat Yovel and Kiryat Menachem neighborhoods and Hadassah Ein Kerem Medical Center in the south. This extension will add tens of thousands of additional residents to the service and will improve the connection between the capital's medical centers and campuses.

Below are some of the key areas the LRT will serve:



- **Pisgat Ze'ev and Neve Yaakov:** Following years of traffic jams, the LRT will link the northern neighborhoods of Pisgat Ze'ev and Neve Yaakov with the center of town.
- **The Eastern Gate (French Hill Junction):** The entrance to the city for those coming from the north and the Shefela region (via Road No. 443). Here is where the LRT depot, as well as the control and maintenance center, will be built, and a commercial and employment center is also planned.



### **Bridge of Strings**

The District Construction and Planning Committee has approved construction of "The Bridge of Strings" on which the LRT will run between Jaffa Road and Herzl Blvd, above the junction at the entrance to the city. The bridge, which will serve as the main gateway into the city, was designed by the renowned Spanish architect and artist Santiago Calatrava. At 120 meters long, the bridge will be built on concrete supports covered in Jerusalem stone, above which will be a hanging steel and glass structure. The bridge will be supported by steel filaments connected to a narrow tower 104 meters high, avoiding the need for massive concrete support columns. Alongside the LRT track, there will be a protected pedestrian walkway, which will offer a breathtaking view of the city and surrounding area from the bridge.



- **National Headquarters Junction (Ammunition Hill):** The entrance to the city for those coming from east – from the Jordan Valley and Ma’aleh Adumim via the Mt. Scopus Road. The station will serve those who work at the government ministries and the National Police Headquarters, pupils, students and residents of Ramat Eshkol, Ma’alot Dafna, and more. A “park and ride” lot will also be built at this station.
- **The Damascus Gate:** The city’s eastern section. This station will serve as a transportation connection point between the LRT and the central bus station in East Jerusalem.
- **Safra Square:** The home of the Jerusalem Municipality and an outstanding tourist site, linking the western part of the city with the Jaffa Gate and the old city walls. This will be an important station for the city’s residents and for tourists who are visiting its sites.
- **Jaffa Road:** The downtown area will regain its importance in the wake of the LRT project, and will serve as a commercial and entertainment center. Only pedestrians and the LRT will be permitted on Jaffa Road, and the street will become a pleasant pedestrian mall.
- **Main entrance into the city:** The western gateway into the city will serve as an important crossroads for all means of public transportation, and will enable passengers to transfer between them: urban and interurban buses, the LRT and Israel Railways (Route 1A). In addition to the International Convention Center at Binyanei Ha’Ooma, plans call for a compound with services, commercial and tourist-related projects. A “park and ride” parking lot will reduce the use of private cars within the city.
- **The Government Center – Givat Ram branch:** The international tender included an option for building a branch of the first LRT line that would serve the government ministries, the Knesset, the Supreme Court, the Israel Museum and the Givat Ram campus of the Hebrew University.
- **Kiryat Moshe, Beit Hakerem:** These are among the city’s oldest neighborhoods, with a high concentration of educational institutions, such as the Beit Hakerem Teachers’ Seminary, the Mossad HaRav Kook Yeshiva, the Institute for the Blind and Hebrew University’s Givat Ram campus. There are also many hotels and guest houses there.
- **Mt. Herzl, Bayit Vagan:** Convenient access for those visiting Mt. Herzl, Yad Vashem, Sha’arei Zedek hospital and Yad Sarah.

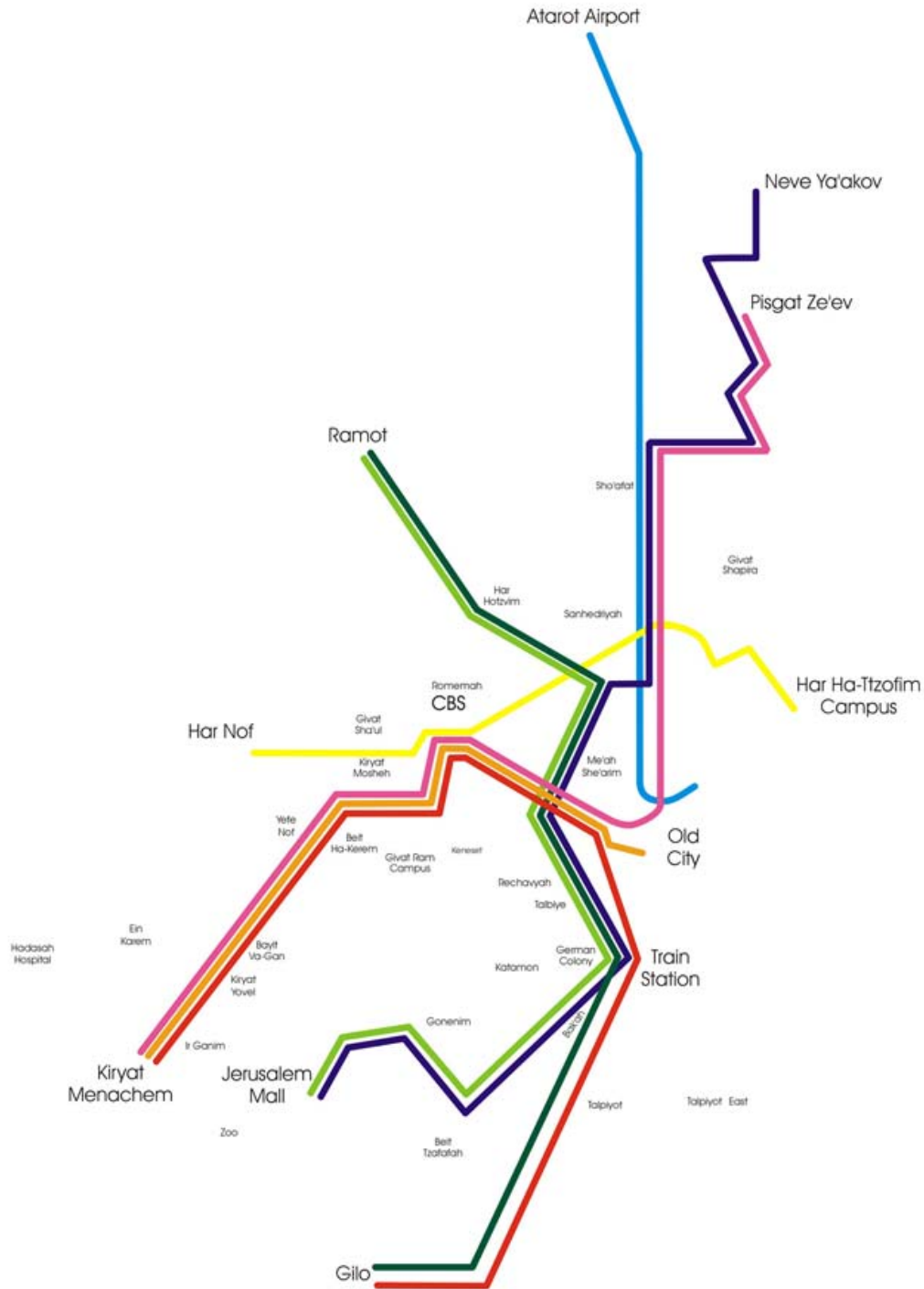


רמת יסוף (לפני)



רמת יסוף (אחרי)

# Light Rail System in the Jerusalem Metropolitan - The Full System



\* The Jerusalem Transportation Master Plan team is updating this scheme based on the developments of the city

## 2020: The Complete System

There will be about 1 million people living in the Jerusalem metropolitan area by the year 2020. Until then scores of kilometers of arterial roads for public transportation will be completed, as well as a system of ring roads around Jerusalem for private cars. The complete LRT system will be coordinated with the metropolitan outline plan. In addition to technical and topographical considerations, the routes of the lines will be decided on the basis of three underlying principles:

- From the neighborhoods to the center: The lines will travel from the neighborhoods and cross through the center of town, in order to serve more areas, reduce the need for transfers, and to enable transportation for a wider suburban region.
- More lines along routes with the most passengers: A passenger may alight any train that comes along and transfer downtown to any other line he may need.
- Transportational adaptation: Adapting means of public transportation to the nature of the urban activity in each area of the city: residential areas, employment, commerce, academic activity and entertainment.

### “Medicine on track”

The light rail system will improve access and the level of service to tens of thousands of patients and medical staff by linking the city's four medical centers: Hadassah Hospitals on Mt. Scopus and in Ein Kerem, Bikur Holim Hospital and Sha'arei Zedek Hospital.

### Investing in environmental quality

All along Jaffa Road there are plans for extensive urban planning for commerce, office space, housing and tourism, while preserving the appearance of the street and restoring its former glory. As part of this work, some 5,000 broad-leaf trees will be planted, and buildings with historic value will be restored.

