Chapter Fourteen

Transportation

14.1 Introduction

The central goal of the outline plan in the field of transportation is the promotion of the transportation system in a way that supports the proposed urban development, while giving significant priority to public transportation above private transportation.

The "Transportation System" (see Figure 1) includes:

1. Road system
2. Transport means by public transportation, from light railway routes to local bus routes.
3. Arrangement of public parking lots including park-and-ride lots.
4. Transportation centers including: Stations, Parking lots and Terminals of public and private transportation.
5. Israel Railways stations for the routes between and the Tel Aviv metropolitan area.
6. The Atarot airport and existing and planned helicopter pads.

All of these together as they are expressed in the outline plan Jerusalem 2000 constitute the planned transportation system, of which part is implemented by means of approved plans and part is under detailed planning processes, and the remaining needs to be planned under detailed plans.

"The proposed urban development" means additional residential and employment areas in all parts of the city according to the outline plan. However, development also includes tourism and leisure and recreation trips and assumes the improvement in levels of income that lead to increases in motorization, in other words, increase in number of vehicles of the residents. The widening of the city boundaries and the activities within it as described, are dependent on an appropriate transportation infrastructure that permits the residents, mobility and accessibility between the various centers of activity.

Without the possibilities of mobility of people and goods within the city, from it outwards and towards it from all parts of the country, the functional connections between the different parts of the city will be prevented, which will call into question the achievement of the goals set out in the outline plan, including that of increasing the level of planned economic activity.

"Significant prioritizing of public transportation above private transportation" is a central part of the solution proposed. Although the setting up of the complete transportation system is an indispensable condition for the development of the city, however it is not enough to build the transport system, it must be put into operation: The transportation must be managed. The well known congestion on the roads at peak travel times reflects not only lack of proper transportation infrastructure, but also failure of "traffic management" and inappropriate use of the existing infrastructure.

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The contention is heard many times over, that if the passengers in private cars sitting in traffic jams at peak hours, could have traveled in comfort without delays if only most of them had chosen to travel by public transportation: 50 private vehicle passengers can sit in comfort in one bus. However, it is not enough to leave the desired switch from the private car to public transportation means as a slogan or ideology. Even in Europe, blessed with quality and reliable public transportation, there is a switch, however gradual, from public transportation to the use of the private car, and hence the phenomenon needs to be understood in depth.

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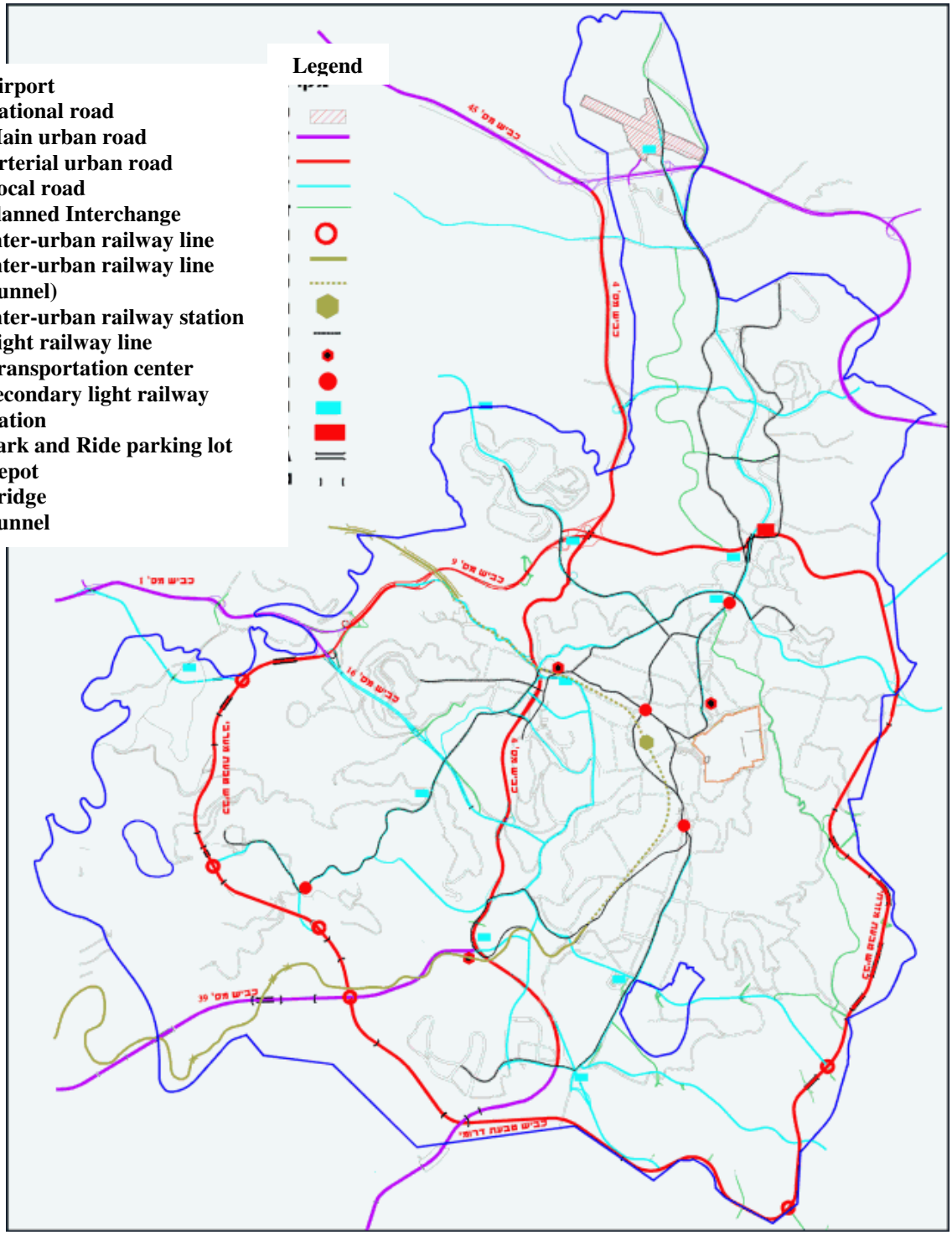

Figure 1- The Jerusalem Transportation System 2020

As a practical conclusion it can be stated that in the competition between the private car and public transportation, there is no significance to the cost of travel on public transportation. Factors such as travel comfort and convenience, reliability, prestige and total door-to-door travel time are the significant ones. The major question that faces the private car driver is where to park the car. The more it becomes difficult to find a parking space close to the travel destination, the more public transportation becomes more attractive. Transportation policy can be described as a policy of "carrot and stick", where the carrot that appeals to the taste of the driver is modern public transportation that is reliable and comfortable, whereas the stick is the restrictions on parking for the private vehicle.

It must be remembered that it is possible to circumvent the restrictions on parking when factories and businesses choose to locate in areas that have no parking restrictions and are easily accessible to the private vehicle. In this way transportation policy can become an obstacle to the development of the city by preventing the planned dispersal of desirable land uses. The desire for mobility of the private vehicle and unlimited parking can bring about the movement of factories and businesses to areas of undesirable locations and even to areas outside the city boundaries.

Therefore, it is to be emphasized that the transportation policy is the support urban development of the city and is not an objective in itself.

The correct integration of public transportation with possibilities of parking for private vehicles is apparently the correct recipe for a balanced policy. According to this solution, it is proposed to allow parking in park-and-ride lots so that the user of the private car can benefit from its advantages especially its immediate availability at exit from door, and continuation of journey by reliable public transportation from the parking lot located at the spot where the congestion on the roads become a nuisance. Hence the importance of public transportation over the private car.

The difficulty of implementing a reasonable transportation policy is due to the range of intervening factors in the choice of transport means by the passenger, where only part of them are controllable by the setters of policy, as will be detailed in the following section.

14.2 Factors influencing travel modes.

The table on the next page shows the factors that are involved in the choice of travel mode.

It should be noted that the outline plan only plays a secondary role as it defines the physical conditions for the setting up of the transportation arrangements but has no influence at the stage of operation of transportation means and their use.

Table 1: Factors influencing the use of transportation arrangements and travel modes.

Factor	Responsibility	Area of Influence
Outline Plan	Jerusalem Municipality- Planning Committees	Conditions for setting up/paving/ implementation of transportation system
Urban Bye-laws	Jerusalem Municipality	Setting of conditions for the operation, costs, and operating hours of private and public parking lots.
Traffic arrangements and parking	Ministry of Transportation	1) Setting a regime for movement on roads including priorities for public transportation.
	Jerusalem Municipality	2) Defining parking arrangements on the streets, restrictions, payments.
Enforcement	Jerusalem Municipality	Enforcement of parking arrangements. Enforcement of conditions for the operation of parking lots.
Franchises	Ministry of Transportation	1) Conditions for operation of public transportation. 2) Supply of taxis for public use
	Municipality	3) Conditions for the operation of public-municipal parking lots.
Budgeting	Government	Rate of implementation of transportation arrangements and its components.
Setting of costs and taxes	Government	1) Cost of use of private vehicle (fuel, taxes) 2) Costs of operating and use of public transportation.
	Center of Local Authorities	3) Costs of parking on road.
Entrepreneurship	Private firms	1) Accepting the terms for operating public transportation. 2) Accepting the terms of tenders, including operation of parking

		lots.
Agreements	Private and Public bodies	1) Subsidizing of private car use (essential workforce) 2) Free parking places for workers at workplace. 3) Opening hours of offices,businesses and schools.

The complexity of putting into operation a transportation policy, as seen above in Table 1, becomes apparent in three areas:

- It was stated above that "The growth of a city and the activities within it is dependent on a proper transportation infrastructure". However, practically speaking an unambiguous connection between the growth of a city and the improvement in its transportation infrastructure cannot be drawn, because of the fact that the rate of implementation is dependent on governmental budgets that are set by priorities of national government.

- It has also been said that a balanced policy is achieved by a correct integration of public transportation and parking. In the table it can be seen that whereas the issue of public transportation, including the setting of priorities for public transportation on the roads, is within the authority of the Ministry of Transportation, the issue of parking in its entirety, is within the responsibilities of the municipality.

- In the subject of the use of the private vehicle it can be seen that the two factors that have the greatest influence, i.e. subsidization of employee use of car by employer (essential workforce), and provision of parking for the employee at place of work, are results of agreements (the government, and following it, the municipality, are one of the parties to these agreements).

14.3 Transportation Policy

14.3.1 Improved Public Transportation and accelerated development of a mass transportation system.

In Jerusalem a decision to base the public transportation on the routes of a light railway network was taken. This is an important strategy decision that brings Jerusalem to the forefront of progress in the operation of mass transportation.

The close affinity of the outline plan and its goals with the light railway system follows from three factors:

- The target population of 950,000 persons demands an efficient and convenient transportation infrastructure, due to the fact that the possibilities of developing

a road system are limited and there is no way to make significant changes in the Master Plan of the 80's (except for the addition of a southern ring road that does not make a significant change to the outcomes of the system). Mass transportation is a must for the development of the city in view of the goals of the outline plan.

- The outline plan adopts the approach of sustainable development. This kind of approach is based on a decreasing use of the private vehicle and giving significant priority to mass transportation. The light railway system brings to a full realization of the described policy: It is environmentally friendly while having all the properties of a mass transportation system.

- The dispersal of employment zones in the new outline plan is built on a conception of clustering of employment precincts in the inner city and in the areas adjoining it (city center, Givat Ram, Malha, Mt.Scopus, Har Hotzvim). The connection with the employment clusters and between themselves is a condition for success of the employment policy. There were those who spoke of this connection in picturesque terms as a "moving sidewalk" at enables the travel from one employment precinct to another in less that 15 min.

From all the above, the decisive importance placed by the outline plan on the light railway system becomes clear.

In spite of the fact that light railway systems operate today in many cities with success, it is necessary to invest a lot of effort in order for the first route of the railway system in Jerusalem to become a success, so as to:

A) Create trust in this type of public transportation.

B) Create incentives for the operation of additional lines.

If the first line does not succeed, there will apparently be no second chance for this type of public transportation.

It should be emphasized that the light railway lines will operate in conjunction with bus lines, some of them in special separate bus lanes in roads, some of them in designated traffic routes that will connect population centers and activity foci with light railway stations. The operation of public transportation with lines of the light railway "spine"
and feed lines of buses is based on the transfer between different modes of transportation at stations, and is completely different from the "classic" mode of operating designated bus lines that have direct connection lines to the central targets in the city/ neighborhood.
A mass transportation system that is based on transfer of passengers between different modes of travel at stations needs control and timing mechanisms that will ensure the continuity of travel without delays. The light railway system is such a system as it operates under complete control and can provide reliable service. The big challenge is to ensure a similar level of reliability for the buses in the feeder lines.

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The success of the operation of the light railway system depends on a proper development of the stations in conjunction with timed feeder services. In addition, investments should be made in marketing in order to influence consumption habits and public consciousness that so far has rejected the option of public transportation.

The light railway system in Jerusalem has the potential to cause significant change in the travel habits in the city. In order to achieve the goal of a clear change in the trend to private vehicle use, a period of many years is required and a prestigious operating system together with a critical mass of lines that can serve a major portion of the population.

In order to arrive at such an operating system, the implementation of extra lines of the light railway system and other mass transportation lines such as guided buses, need to be promoted vigorously. The connection of the second and third lines to the first line of the light railway that is being carried out at present is the biggest challenge to the transportation bodies in Jerusalem for the coming decade.

The routes and terminating points of the additional lines will be decided upon in consideration with the dispersal of the population and the location of employment clusters on the one hand, and the desired directions of development of the city as laid out in the outline plan, on the other. It should be noted that the priorities of setting out routes are not guided by the projection of transport demand only, but is also based on the assumption that the very construction of the mass transportation system will serve other goals, the achievement of which will also increase the demand for travel in the system.

In accordance with this, it is possible to set out the principles for the laying out of routes as follows:

- The routes should incorporate interface points between themselves so as to create a network.

- The routes should support the city center in order to bring about its revitalization.

- The network of routes have to be connected to large transportation centers (Central bus station, railway station, park-and-ride lots near main road network).

- The routes have to serve the large population centers in the north (Neve Yaakov, Ramot, Haredi neighborhoods).

- The routes must serve activity foci and connect between them. A short travel distance between the activity foci is a necessary condition for the creation of an employment cluster that includes educational and research institutions, commercial and employment services.

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The following are important routes of high priority that have to be installed at the earliest opportunity without going into exact routes, so as to implement the goals of the outline plan (see Figure 2).

- A connection between the central bus station in the west of the city, the Government compound, Kiryat Ben Gurion, Givat Ram campus, Technological park and Malha.

- Connecting Hadassah (Mt.Scopus) and University campus (Mt.Scopus) to the system.

- Continuation of the first route to Neve Yaakov and to Hadassah (Ein Karem).

As second priority:

- Connecting Givat Shaul industrial area and Har Nof to the system.

- Connecting Talpiot, City Center (North-South), the Haredi CBD near Har Hotzvim (and continuation at a lower level from Neve Yaakov to Atarot).

The system as described above will enable the connection of the two campuses of the Hebrew University through the city center, will allow student accommodations in the city center, will encourage the revitalization of the city center and will bring back activities and functions that had drifted away.

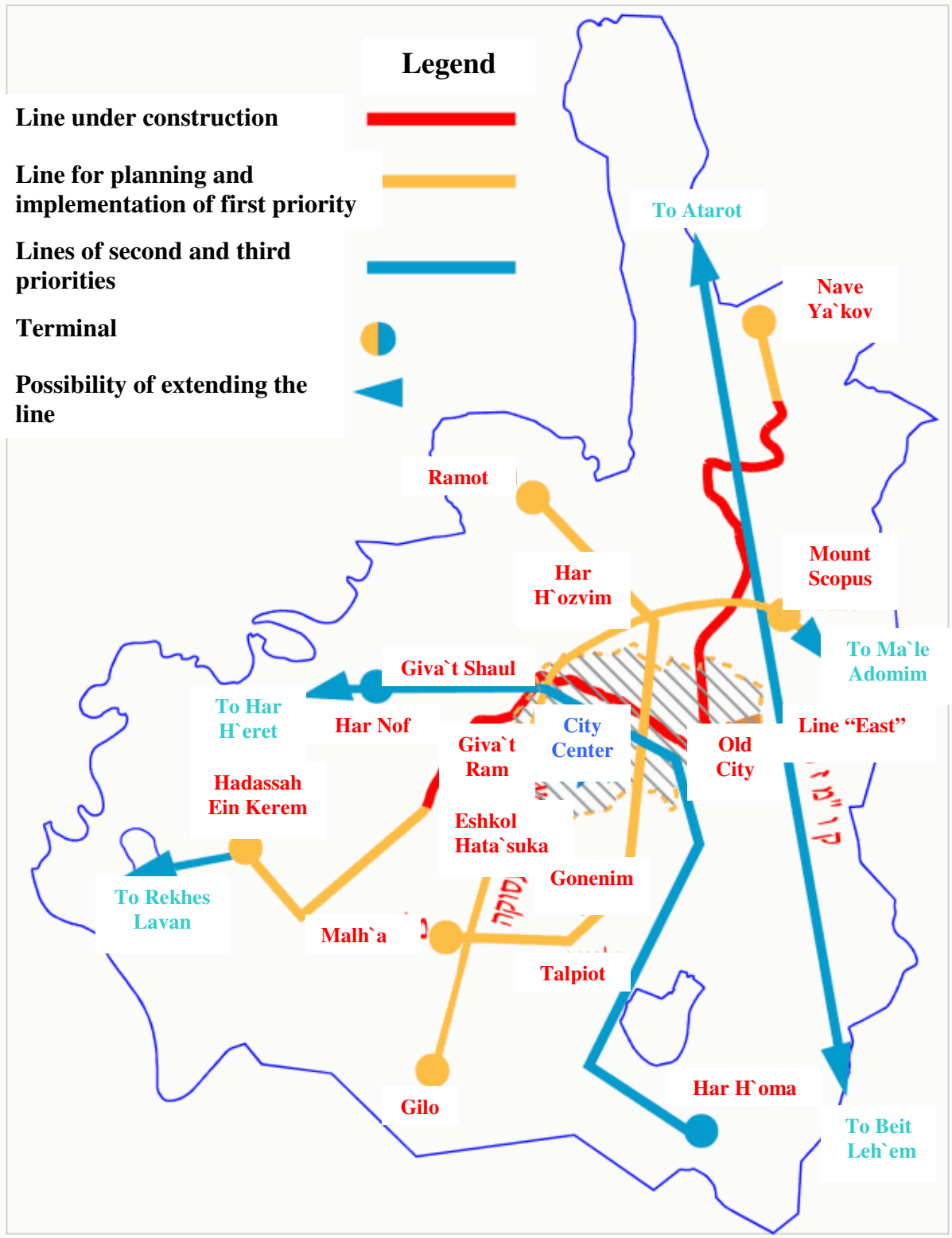

Figure 2- Development Schematic for the Mass Transportation System

As third priority:

Only at a later stage when the development of the employment cluster has reached implementation should be executed the connection in the direction of the employment center and residential areas in west Jerusalem (Har Harat and Mevasseret).

It should be noted that the routes of the light railway that are drawn in the Transportation appendix of the outline plan are a consequence of the District Outline Plan TAMAM/1 Change No.29. According to the regulations of the district outline plan it is possible to lay out further routes for the light railway by means of a local plan.

14.3.2 Completion of the implementation of the Main and Arterial Road system in Jerusalem and creating interfaces with the inter-urban road system.

The completion of planning processes and approval of implementation plans for the ring roads, completion of Road No.4 in the south and the paving of Road No.16, are parts of a infrastructure development goals that supports the development of the city.

The main road system of Jerusalem, especially the ring roads, have two objectives:

1. To "drain" the through traffic from the inner city and to bring it to the main roads.

2. To disperse the traffic that arrives at Jerusalem from the national roads to the access points appropriate for the travel destinations.

In other words, the necessary condition for the calming of traffic and the giving of a clear priority to public transportation in the inner city is the evacuation of the rights of way for the benefit of public transportation. This can be achieved only by the creation of a peripheral road system (ring roads) that can absorb the traffic diverted from the inner city.

The achievement of these objectives is largely dependent on the ability of the ring roads to provide fast and free traffic at a high service level (This requirement is related to the planning brief ' in other words, to the designed speed, width of lanes, slopes and building interchanges instead of intersections on the ring roads).

In addition, the viability and the attractiveness of the ring roads have to be strengthened by locating parking lots and transportation centers along their routes.

In the planning of the proposed sections of the new main roads that pass through open spaces, the emphasis should be placed on the blending into the landscape by means of the use of bridges and tunnels. It should be noted that in the skeleton plan of the main roads as drawn in the outline plan' more that 20 % of the road routes lie within tunnels. The length of the tunnels and their exact locations are

not binding but their marking in the transportation appendix constitutes a binding regulation for routing the road in a detailed plan.

14.3.3 The Installation of parking arrangements that comply with transportation policy.

The supply of parking places in the different areas, the location of parking lots and their operation, are essential subjects of devising transportation policy. It has already been stated that the central question that worries the users of the private car is where to park the car: The harder it is for the user to find a parking place near the travel destination, the more attractive public transportation becomes.

The parking arrangement is composed of interrelated components:

1. The parking standard that sets the number of parking places that will be provided in every new project. The implementation of the Government decision of 1997 to adjust the parking standards to the policy of giving priority to public transportation and the planning progress of mass transportation in Jerusalem has made it essential to change the parking standard which was set down in the regulations of the planning and building law about twenty years ago. In parallel to the preparation stages of the outline plan, the local outline plan No.5166 was prepared and approved[1]. This plan determines the parking standard for the city. The basic assumptions of the parking standard according to Plan 5166 which are in accordance with principles of the planning policy of the outline plan are:

    A. The decrease of the parking standard in the city center and in public transportation rich areas will be done gradually so as to follow the rate at which the mass transportation system is developed.

    B. The parking standard is part of the comprehensive policy of traffic and parking in the city.

    C. Until the completion of the mass transportation system and its realization, there will be discretion given to the owner of land rights and the local authorities as to the binding parking standard to be used.

    D. Detailed plans in which binding parking standards are set cannot be changed.

The main points of the parking standards as set in the documents of the outline plan are as follows:

[1] The plan was prepared by M.Cohen of Keshet (Promotion of Planning Services) in partnership with Mr.Kobi Bar Tov, Deputy Director of Transportation and Engineering ServicesDepartment, Jerusalem Municipality.

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A. Residential- The residential areas of the city have been divided into three categories pf parking standards according to the level of motorization typical for the population group living in the area: High parking standards area, Medium parking standards area and Low parking standards area. In buildings slated fro preservation the level set was lower so as not to harm these buildings.

B. For Non-Residential uses: The city was divided into three zones:

- The CBD (all three parts)- The owner of land rights has the possibility of choosing between the existing standard, or the lower standard or any other standard up to the maximum permitted by the planning and building regulations with cancellation of the duty to pay into the parking fund (excepting residential).

- Public transportation rich area- A lowered parking standard according to the stage of implementation of the mass transportation system. However there is discretion given to the local committee and the owner of land rights as to the binding standard until the implementation in reality of the mass transportation system.

- Rest of the areas in the city- Binding parking standards according to the regulations of the plan.

2. The parking arrangements in the road, i.e. a payment for parking to be paid in on site parking meters. The areas in which on street parking is allowed are those areas in which the parking standards reduce the availability of parking places and for those reasons. Furthermore, the allowed on-street parking is meant to create short term parking only, together with signs which allocate parking for loading and unloading of merchandise for commerce and businesses. The reduction of parking in the streets of the CBD is part of the actions taken to redesign the space of the urban street and make it friendlier for walking.

3. It should be noted that it is possible to make gradations in the supply of parking places by means of setting different rates for different areas as a function of distance from the CBD. Similarly, the rates in the parking lots in these areas should be adjusted so that it is more worthwhile to park in the underground parking lots and not on the street.

4. Parking lots outside of the city center area: The parking standard allows for the “transfer” of the duty to allocate parking places within the lot to a parking lot designed for this purpose, generally outside the city center, and of a size that allows for parking needs of several projects. The transfer of the duty is generally done by means of payment into a parking fund set up in order to construct the parking lot, and is a powerful means for locating parking lots in the areas of good accessibility and not in the crowded area of the city center with all that this entails in terms of congestion in the streets of the center.

5. Park-and-ride parking lots: These are parking lots planned in the transportation centers or at other points in which there is an interface between main and arterial roads and the public transportation system. Park-and-ride lots are constructed as transportation projects as part of implementing the planned transportation system in Jerusalem. Their operation should be integrated into the operation of the mass transportation system in areas such as parking tickets and transfers.

6. Bus parking lots: Since the outline plan is based on developing the light railway, no increase in demand for areas for bus parks (overnight parking) is expected. (It should be noted that with the putting into operation of the first route of the light railway, a decrease in the allocation of public transportation buses is to be expected). However, there is a need for operational terminals for the public transportation buses in the new residential neighborhoods just as they exist in the existing neighborhoods (with an area of about 2 dunams each).

7. The problem of parking for tourist buses is not properly organized, and in the old city basin near the tourist focal points, the buses have become a nuisance. Here also what is needed is a policy of "carrot and stick". In addition to the enforcement of forbidden parking of buses while allowing the dropping off and picking up only near the focal points, tourist bus parking lots should be located and prepared as waiting points for the buses until the allotted pick up time or until they are summoned by phone. The areas for such lots partly already exist (Ammunition Hill, Bell garden, Sherover promenade) and it seems that the first step in arranging the problem is dependent on coming to agreements with the operators and tourist guides and setting up a force for enforcement and policing.

8. Parking for Heavy-Duty vehicles: Areas for the overnight parking of heavy duty vehicles should be located, especially for vehicles that transport hazardous material and whose parking in residential areas is forbidden by law. In the entrance to the city in the west near Givat Shaul there is one lot (Plan No.5246 a) and in the planning brief for the transportation center next to the railway station planned in Malha, area for a goods terminal and heavy duty vehicle parking lot has been demanded, however an appropriate area has still not been found. If these two parking lots are set up, this will be a first step in the direction of solving the problem of parking for heavy duty vehicles. And the second step, more complicated, will be to make arrangements, while setting parking rates, for the operation of the lots including security and transport services for drivers to and from the lots.

14.3.4 Traffic Calming

One of the objectives of the outline plan is to "give back" to the neighborhood residents part of the area of the streets, by developing streets within a format that lessens the presence of motorized traffic and eases walking and recreation in the streets as part of the active neighborhood space. For this purpose, in every detailed

plan that includes a residential area, the guidelines of the Ministry of Transportation for "traffic calming" should be implemented. This includes a requirement for a preliminary examination for differentiating between the traffic calming zone and the buffer streets, in other words, the ordinary neighborhood streets that are not included in the traffic calming zone.

It should be noted that the area of streets in a residential area is about 20 % of the neighborhood area, hence the importance of setting aside part of the street area for activities of the residents while neutralizing the "threatening" presence of traffic. The importance of involving the residents in the planning and operating traffic calming cannot be overly emphasized.

14.3.5 Airports

In the national outline plan for airports (TAMA 15), the airport at Atarot has been designated as an international airport. Accordingly, building height restrictions have been applied in the adjoining areas of the airport in the landing and takeoff paths. The outline plan adopts the location of the international airport with all that this entails.

There is a plan to extend the length of the runway towards the east. The plan necessitates the realignment of the Ramallah road under a tunnel under the extended path and the displacement of the roadway westwards to the path that used to exist before. The new path of the Ramallah road under the extended path will be mapped in the roads appendix of the outline plan.

The outline plan will define locations for helicopter landing pads. In addition to landing pads near hospitals and the national police headquarters, the location of helicopter landing pads is found to be of importance for placing Jerusalem on the future map of helicopter transportation. In order to service the landing pad and integrate it into the Jerusalem transportation system, the landing pad will be located near the transportation center at Malha (Hill 717).

14.4 Means for intervention

The tools at the service of transportation policy makers are:

14.4.1 The outline plan regulations (Takanon)

The regulations of the plan (Takanon) form an important tool for the set the conditions for implementing the transportation system for the city. In the regulations, definitions and conditions are set for the implementation of the main and arterial road system, regulations for implementing a mass transportation system in accordance with the district outline plan (TAMAM 1/Change 29), regulations for setting up transportation centers, park-and-ride parking lots etc.

In addition to these, it is laid out in the sections of the plan, regulations that demand the preparation of a document for examining the transportation impacts as a condition

for approval of plans for projects above a certain size. The aim of the document is to ascertain the transportation impacts of the proposed project and to present the necessary solutions such as: paving and widening of roads, improvement of intersections, special traffic arrangements etc. Similarly, it is stated that in detailed plans for new development precincts located near main or arterial roads, it is mandatory to include the road sections in the plan so as to bring to the knowledge of the residents living adjacent to these roads, the existence of the road next to their place of residence and thus to ensure the residential quality of the residents.

14.4.2 Development and Implementation Plans.

After the adoption of the outline plan by the planning institutions, it is necessary to prepare a joint "Implementation and Development Plan" with all the other bodies involved in the development of the city: The Jerusalem Municipality, Ministry of Finance, Ministry of the Interior, Israel Lands Authority, Ministry of Building and Housing, Public Works Department, Israel Railways, Ministry of Infrastructure.

A. In the plan it is necessary to set out orders of priorities and implementation stages and financing of transportation systems for the next 10 years.

The plan will include all the transportation projects including:

- Implementation of the fast railway between Jerusalem and Tel Aviv, including railway stations in Jerusalem, especially the connection with the southern line that reaches Malha via an underground route that passes through the city center, and an interurban rail station in the city center.
- Road No.39
- Continuation of implementation of the light railway according to the recommended stages of implementation by the outline plan. (See section 14.3.1).
- Implementation of the Main and Arterial Road system in Jerusalem, including the ring roads, Road No.4 south, Road No.16, Road No.20.
- Implementation of park-and –ride parking lots.
- Implementation of an Intelligent Traffic System.
- Implementation of plans for traffic arrangements, including traffic calming in the neighborhoods, bicycle paths, traffic roundabouts etc.

B. The implementation stages of the projects will be connected, among other things, to the starting of implementation of residential and employment precincts as proposed by the outline plan, and with the distribution of financing by the developing bodies.

C. In the plan, there will also be traffic and parking arrangements that will ensure the implementation of the transportation policy in the field of priority for public transportation while controlling the supply of parking places (quantity, location, price).

14.4.3 Setting up of Funds for the construction of public parking lots.

In order to realize the idea of public parking lots a "Parking Fund" should be set up in accordance with the regulations of the planning and building law and to set the payment into this fund as a pre-condition for the granting of building permits. This can only be carried out after the approval of detailed plans that determine the location of these public parking lots, and which define the areas from whom payments will be transferred to the parking fund, including the size of the payment for every parking place.

14.4.4 Setting up of a Parking Authority.

In order to implement in reality, the parking policy, and to unify the treatment of this complex problem, it is recommended to set up a Municipal Parking Authority. This authority will be the authorized body to construct and operate the parking lots in the city and it will be responsible for handling the Parking Funds. The authority will be responsible for the arrangement of the parking in the streets (traffic lights, supply, loading and unloading etc.) by means of an urban bye-law and it will deal with the problem of enforcing in all its aspects.